

**SKF**



# SKF in Wind Energy

EWEA policy workshop 2012  
Presented by Jozsef Budinszki  
2012-07-10

# 1

## SKF Introduction

# SKF Group - Innovating since 1907

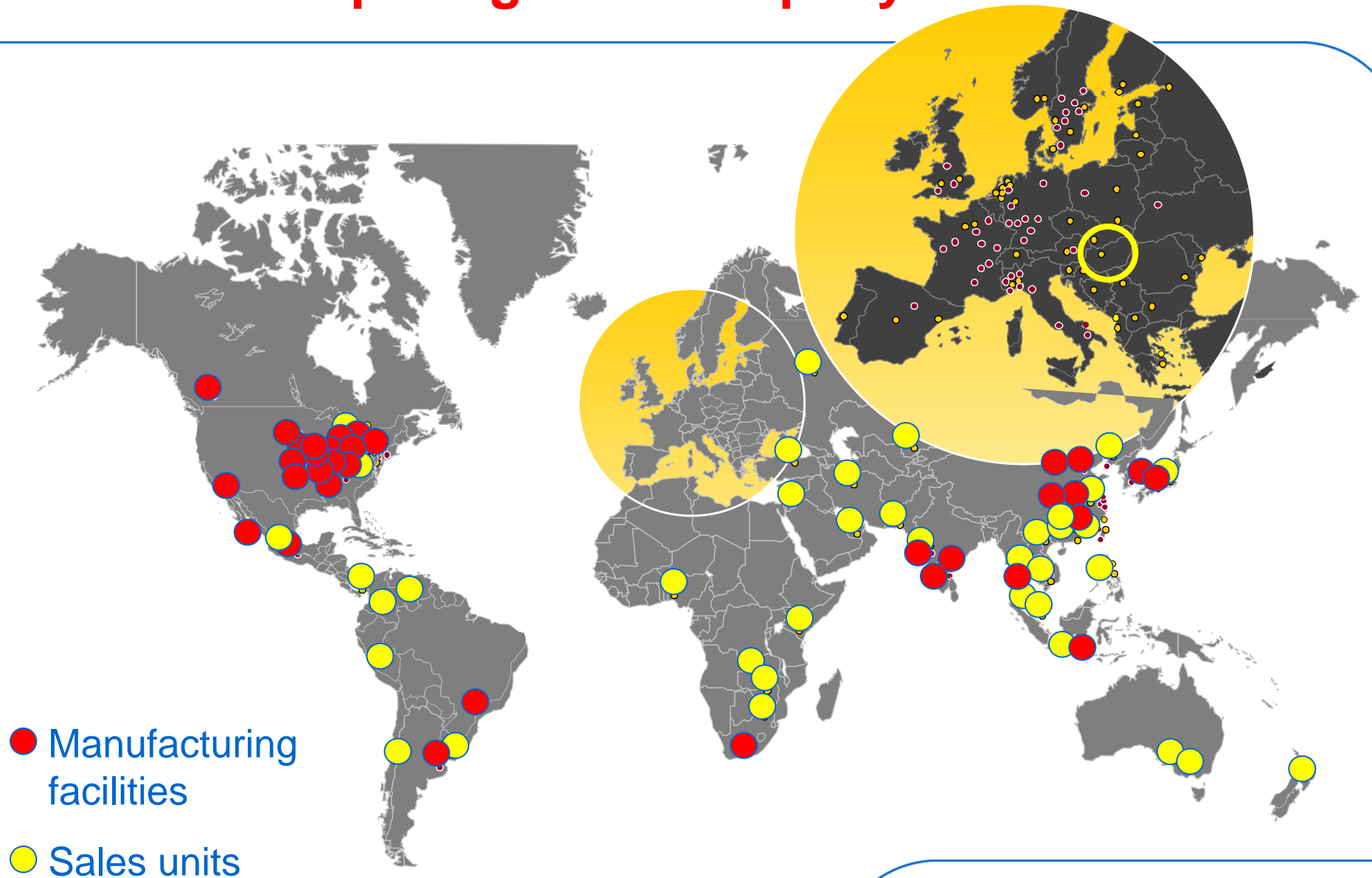


**SKF**®

# SKF - A truly global company

Established:	1907	
Sales 2011:	MSEK 66 216	(6 428 MEuro)
Employees:	46039	
Production sites:	130 in 32 countries	
SKF presence:	in over 130 countries	
Distributors/Dealers:	15 000	
Global certificates:	ISO 14001	
	OHSAS 18001 certification	

# SKF Group - A global company



# SKF Svéd Golyóscsapály Zrt.

Established:	1928	
Sales 2011:	TSEK 163 483	(15 872 TEuro)
Employees:	36	
Distributors:	14 Authorized Distributors	
Shops: country	75 outlets – high density in the	

# SKF Svéd Golyóscsapágy Zrt.

**SKF**

Industrial D/D's in Hungary



**SKF**®



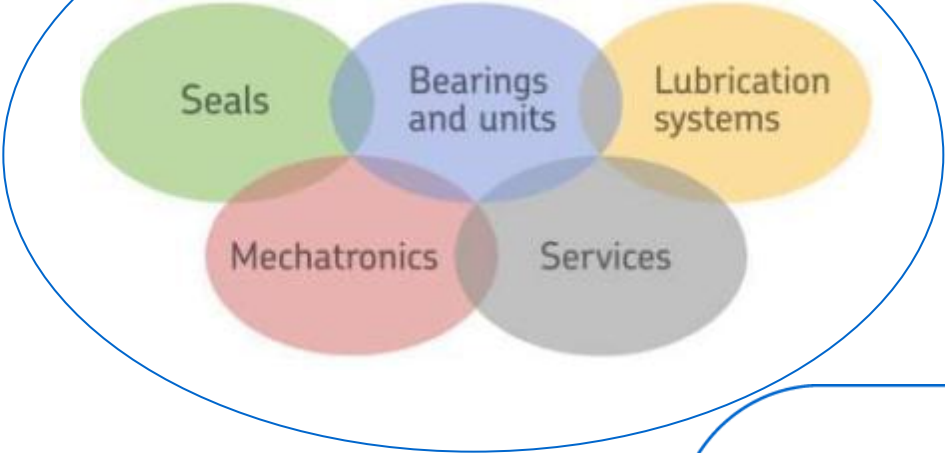
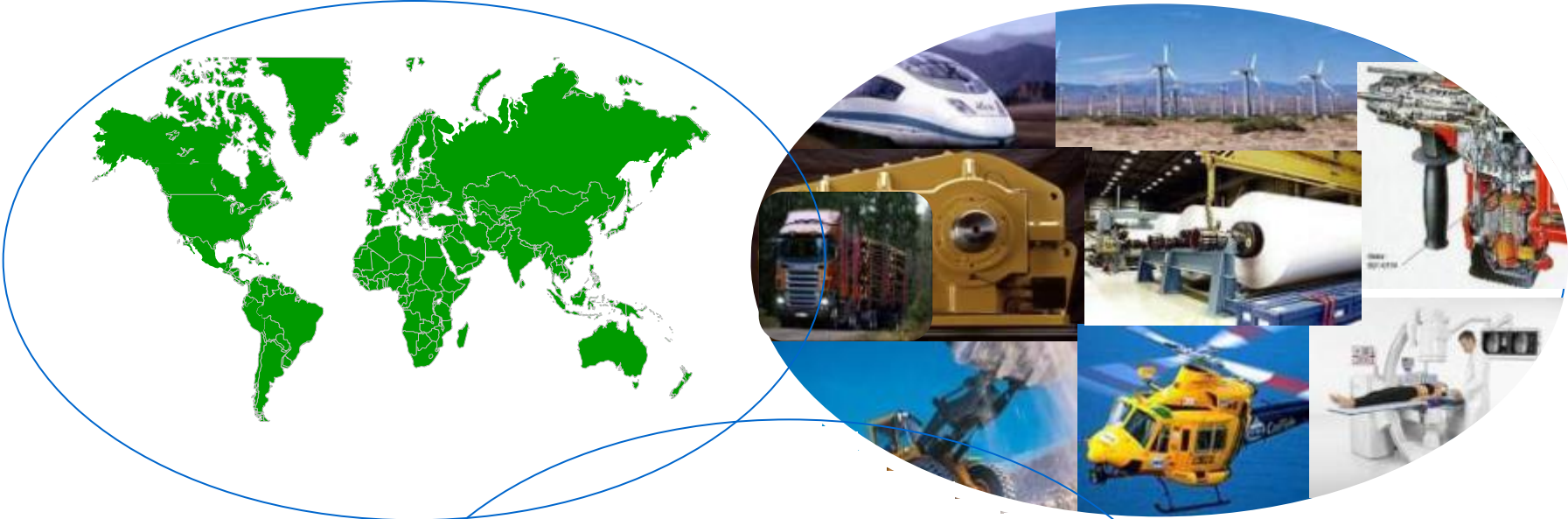
# SKF Group Vision

To equip the world  
with SKF knowledge



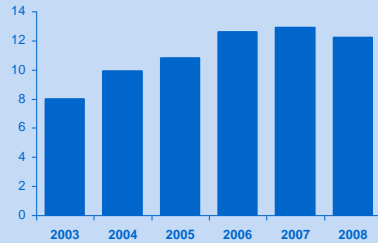
**SKF**<sup>®</sup>

# What is SKF knowledge?



# SKF Care

## Business Care



Operating margin



## Employee Care



BeyondZero™

SKF Care



## Environmental Care



## Community Care

**SKF**®



SKF  
BeyondZero

# BeyondZero™

- Energy efficient bearings
- Mechatronics in welding robots
- Actuators in window facade
- By-wire auto-throttle in aerospace
- Client Needs Analysis – Energy and Sustainability

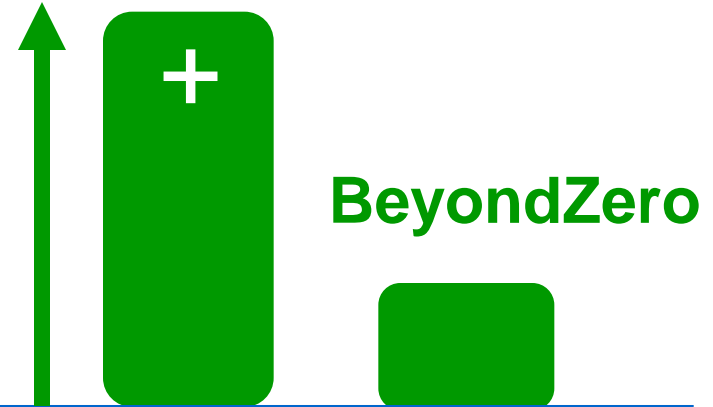
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## Reduce energy intensity

- Energy training + energy toolbox
- Energy efficient pumps
- Energy efficient motors
- Waste heat recovery
- Improved window insulation

## Reduce carbon intensity

- On-site solar power
- Sourcing renewable energy



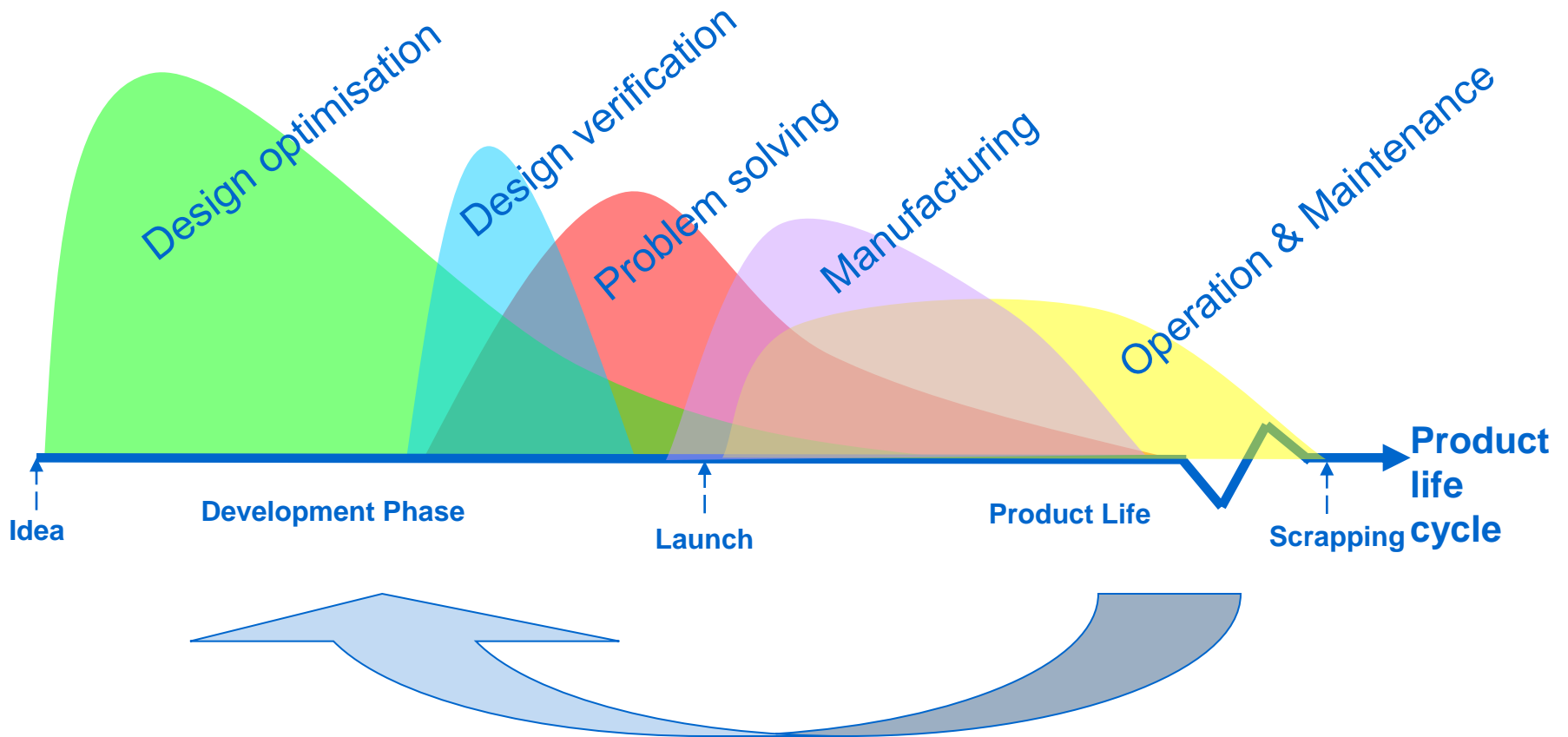
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## Wind energy at SKF

# Wind industry O&M challenges

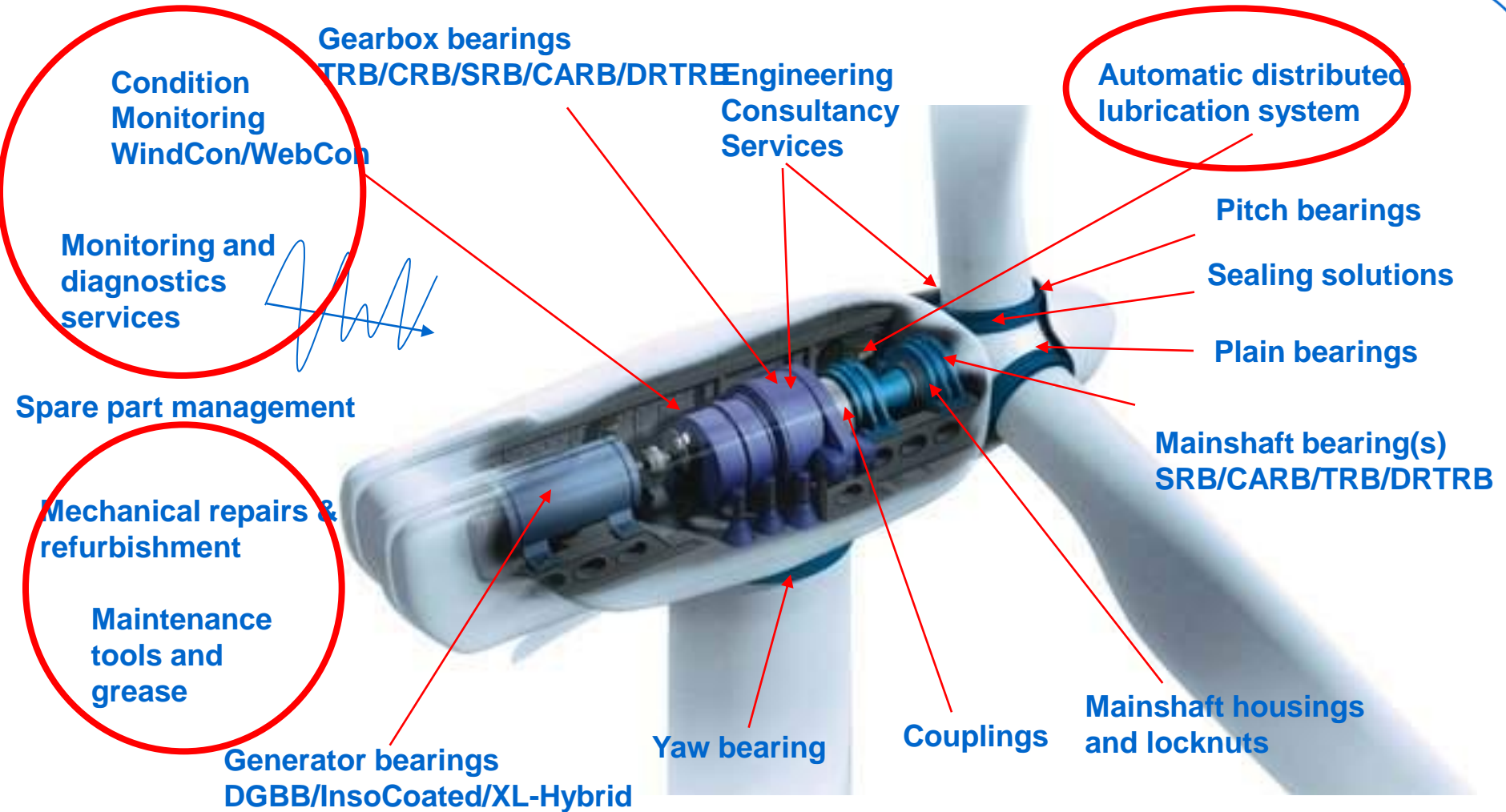
- Constantly changing loads and rotating speed
- Gusting wind conditions
- End of warranty
- Expand intervals between maintenance
- Early faults detection before they lead to major breakdowns
- Keep “damaged” turbines running under controlled conditions
- Better utilization of maintenance activities at planned stops

# SKF involvement in wind turbine life cycle





# SKF contribution to wind turbine technology

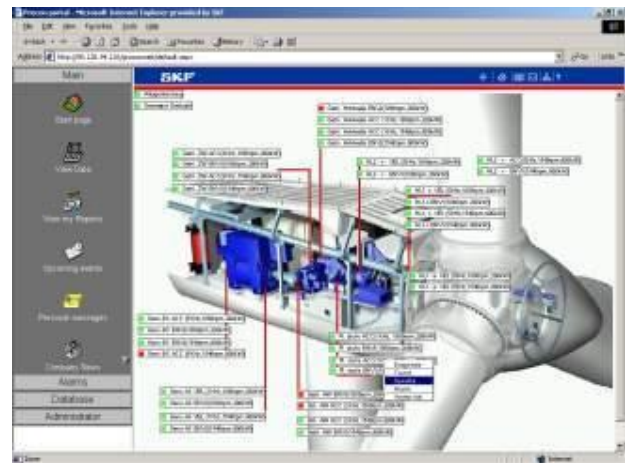
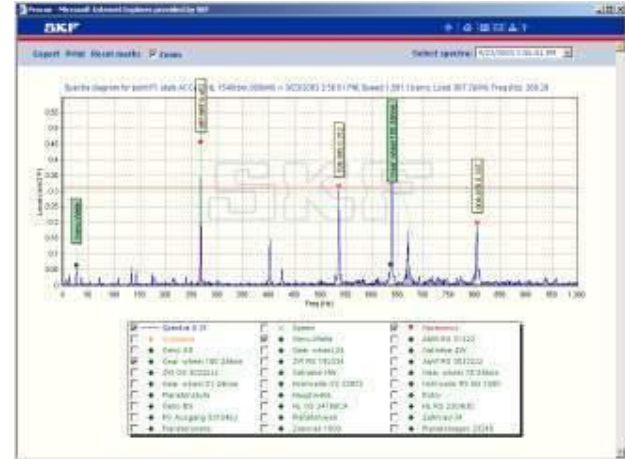


**Bolt tensioning tools**  
**Tower alignment services**

# WindCon - WebCon

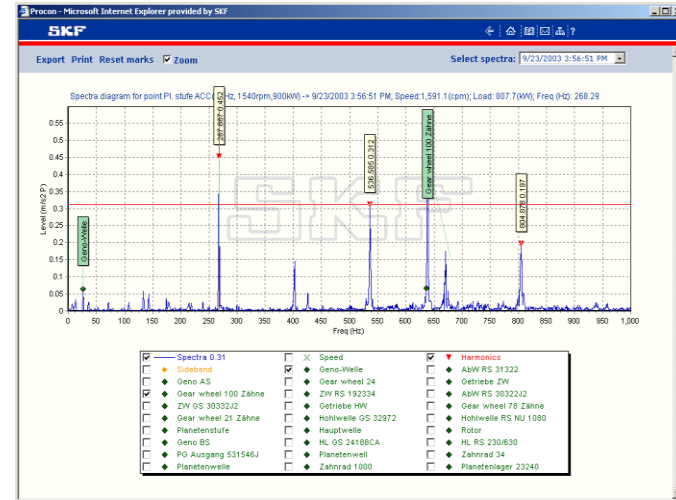
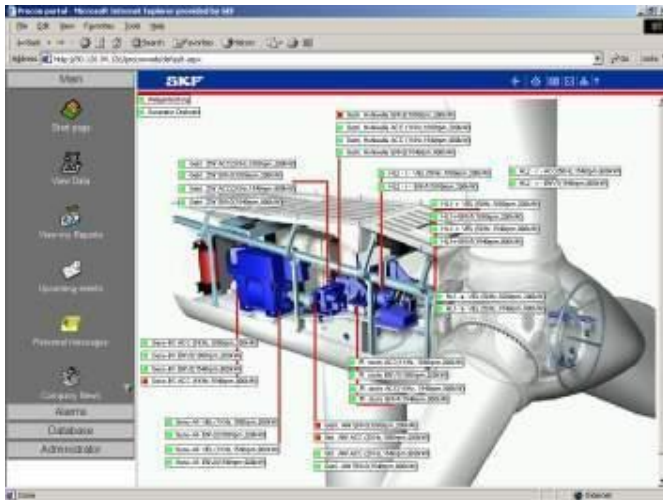


Make the most of your maintenance resources with the SKF WindCon 3.0 condition monitoring system



# SKF WindCon 3.0 with WebCon

- Continuously recalculates fault frequencies
- Make alarm levels dependent of speed/process signal
- Trending based on working condition classes (Allianz)



# WindCon Interfaces

## Gearbox oil monitoring:

- Particle counter in the gear box oil lubrication system

## SKF lubricant delivery system:

- Main, generator, pitch, yaw, pitch yaw gears

## Blade monitoring & ice detection:

# SKF Grease

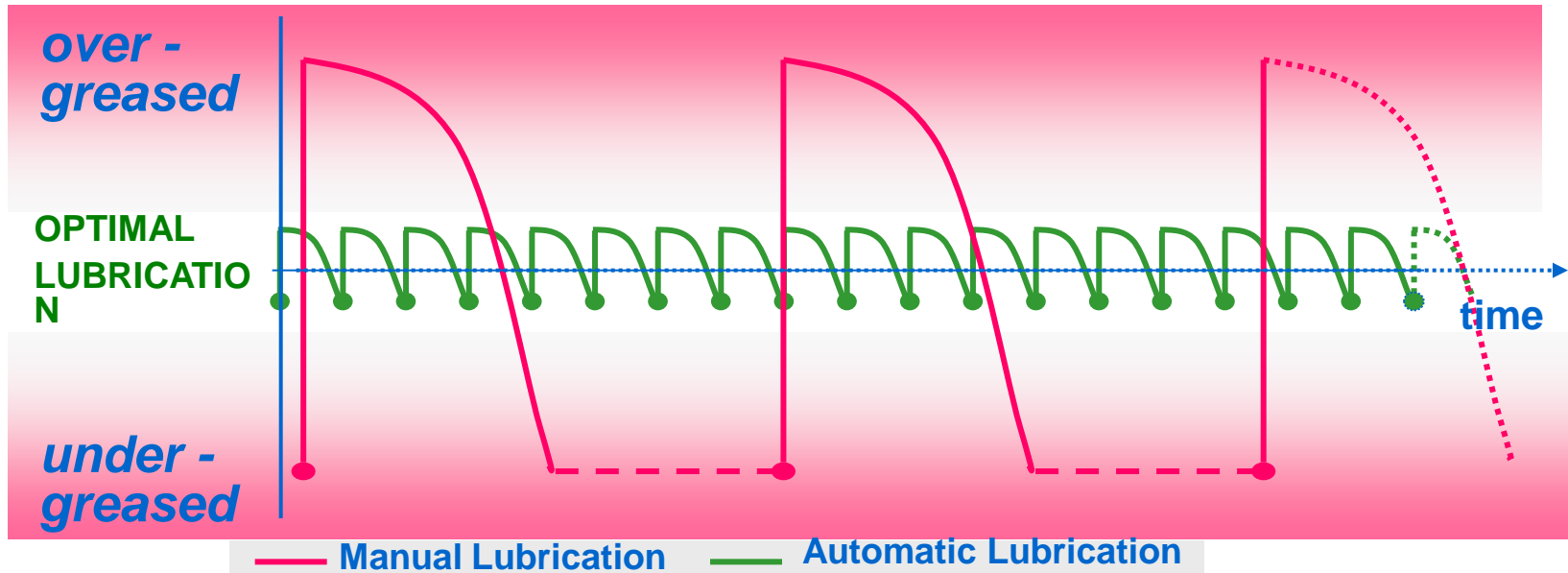
Specialized formulations for wind turbine applications

- LGWM1
- LGWM2
- LGBB2

Greases for entire range of operating temperatures



# Idea of automatic lubrication



Over-greasing

→ Waste and Pollution

Under-greasing

→ Increase of Wear

**Optimal Lubrication**

**→ Very often but very small quantities**

# Products/services for maintenance and repair

- **Spare parts**
  - Bearings and associated products
  - Housings
  - Couplings
- **Mechanical services**
  - Repairs and refurbishments (bearing, gearbox)
  - Alignment; shafts, tower, flanges
  - High tension bolt services
- **Maintenance products**
  - Bearing mounting/dismounting tools
  - Lubrication and re-lubrication products



# Global Manufacturers



GE  
Energy

**TECO**  Westinghouse

**DE**  WIND

**SUZLON**

**SIEMENS**

**Hansen**<sup>®</sup>  
TRANSMISSIONS



**Clipper**<sup>®</sup>  
WINDPOWER, INC.

**moventas**

**Vestas**



GE  
Transportation

**winergy**

**Gamesa**



**Eickhoff**

**Rexroth**  
Bosch Group

**NORDEX**  
We've got the power.

**MITSUBISHI**  
POWER SYSTEMS

**REpower**  
Systems

**SKF**<sup>®</sup>





# SKF's knowledge – at work for the future



SKF 100 YEARS 2007

All we do  
we do for future  
generations

The Power of Knowledge Engineering

**SKF**<sup>®</sup>

**SKF**

