



Classification of all material masters in PARTsolutions and SAP, based on the example of wind-energy engineering company REpower Systems SE

Alexander Schulz

Paulo Ferreira (D&TS)

Industry – Forum 2012, Augsburg

08. February 2012





REpower as a business and its products



Material classification actual and target



The project



Expansion stages



PSOL Key-Features / Cooperation with D&TS / CADENAS

REpower – founded in 2001 as a result of a merger of multiple companies



Denker & Wulf



REpower TechCenter



REpower 5M/6M
Production facility

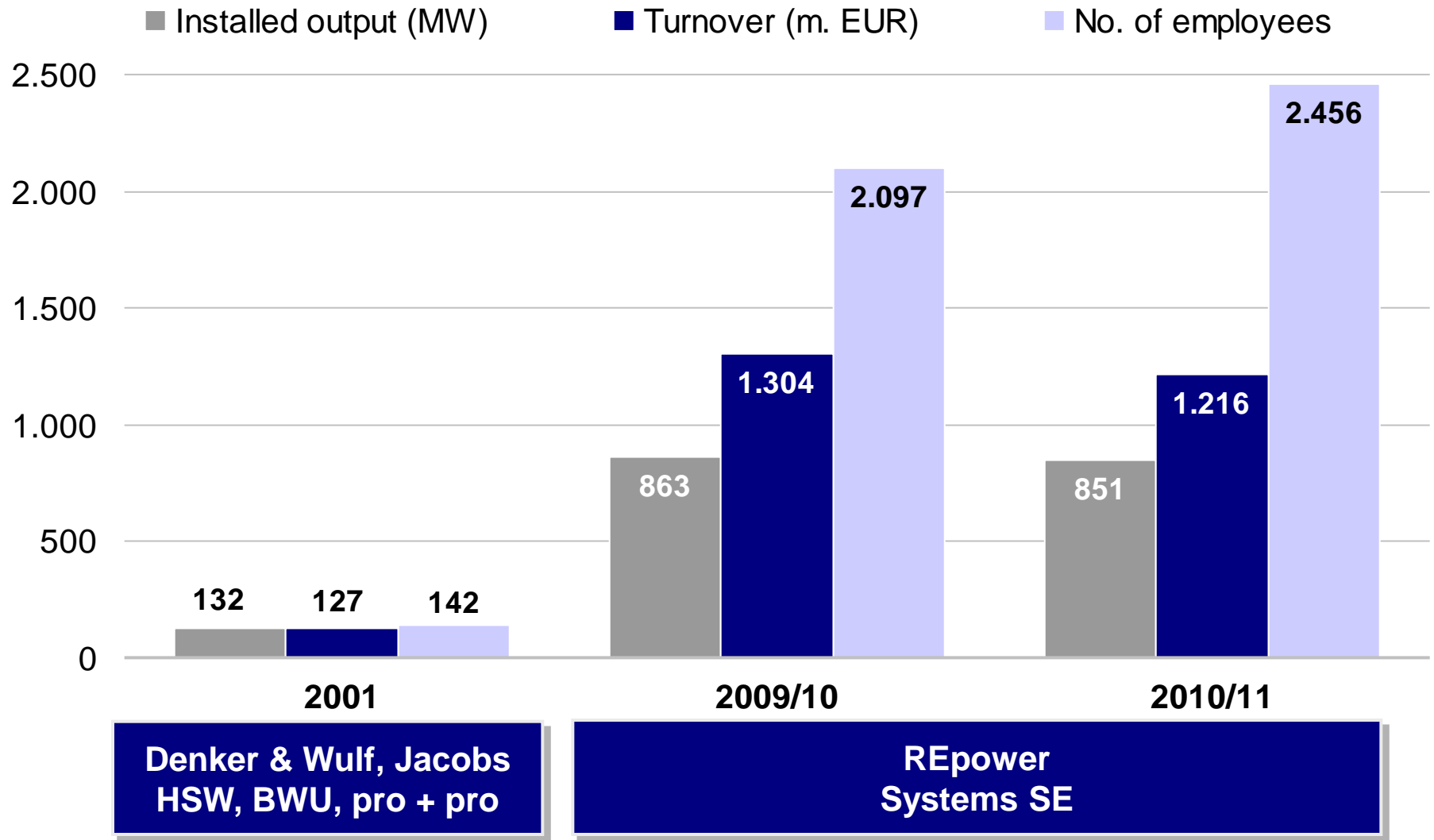


REpower
Husum



REpower
Powerblades

A small engineering company turns into a global player



Product portfolio

	Installation type	Nominal output (MW)	Prototype installation
Offshore installations	6M	6.15	2009
	5M	5.075	2004
Onshore installations	3.4M/04	3.40	2009
	3.2M/14	3.20	2011e
	MM92	2.05	2005
	MM82	2.05	2003
Licensed installations	MM100	1.80	2011e
	MD77	1.50	2000
	MD70	1.50	1998



REpower 6M



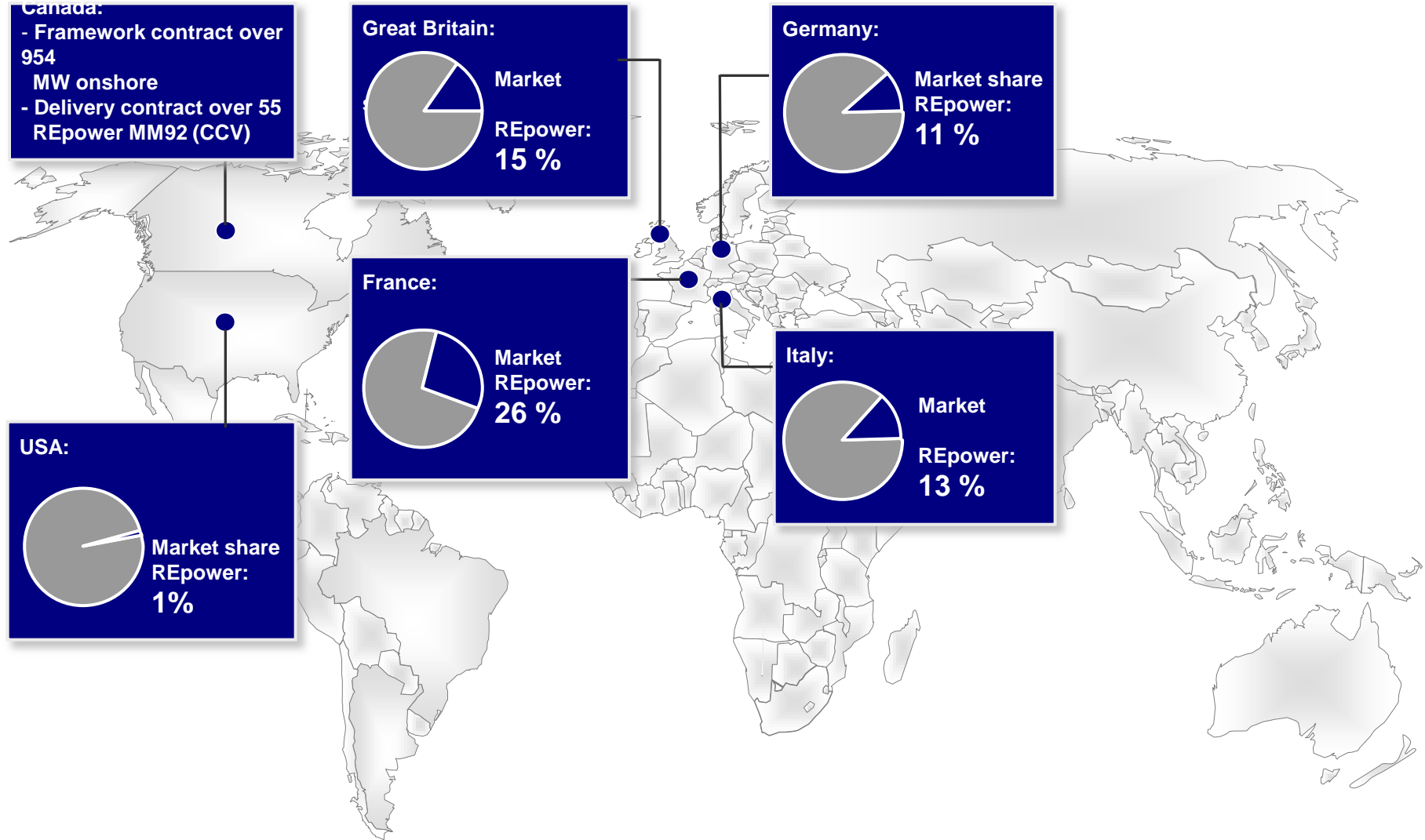
Installation type	6M
Nominal output	6.15 MW
Rotor Ø	126 m
Hub height	Onshore: 117 m, offshore: 85-95 m (location-specific)
Nominal wind speed	14.0 m/s
Certification	Offshore IEC Ib, REpower S-classes, onshore IEC class B/IIA

REpower 3.XM series



Installation type	3.4M104	3.2M114
Nominal output	3.40 MW	3.20 MW
Rotor Ø	104 m	114 m
Hub height	78-80 m, 96.5-100 m, 128 m Hybrid tower	93 m, 123 m
Nominal wind speed	13.5 m/s	12.0 m/s
Certification	IEC Class IB/IIA	IEC Class IIIA

REpower has respectable market shares, most notably in its core markets



Offshore milestones: German offshore field test alpha ventus



Construction of six REpower 5M installations on 16. November 2009.



Client: DOTI GmbH
**Location: German North Sea,
45 km before Borkum**
Turbine type: 6 x REpower 5M
Output: 30 MW
Rotor Ø : 126 m





REpower as a business and its products



Material classification, actual and target



The project



Expansion stages



PSOL Key-Features / Cooperation with D&TS / CADENAS

What is our background?

- Engineering office, small groups
- Significant detailed and varied development and research
- File saving is file system based
- Systems are the main consideration - "BlackBox" drives, converters, etc.
- Manual material data management in SAP

Available working principles?

- SAP is the central logistic system
- The drawing represents the document
- Material management processes in SAP are quite easy
- Master data are managed centrally, constructional engineers submit change notifications

What do we want to achieve?

- Corporate group, spread locations
- Significant detailed and varied development and research
- File-saving development master data, database supported -- SAP
- Systems right down to spare parts level are considered → Spare parts catalogs
- Automated material data management based on available supplier catalogs

Available working principles?

- SAP is the central (logistic) system
- Development master data use / support processes
- Material management processes ensure high data quality
- The constructional engineer manages the master data himself; a central standardization office ensures data quality

Ideas / requirements

- We require classification structures and parts attributes in SAP
- We have to identify and avoid duplicates
- We have to simplify part searches and location
- We want to create a basis for electronic catalogs
- We have to be able to compare parts of different suppliers



REpower as a business and its products



Material classification actual and target



The project



Expansion stages



PSOL Key-Features / Cooperation with D&TS / CADENAS

SAP as a strategic platform

- With REpower Systems SE, SAP is a strategic platform
- SAP is the central system for logistic processes
- SAP is available virtually everywhere
- At this stage, SAP is already providing the infrastructure
- SAP has a number of relevant PDM-functions



Moving from "simple" material classification to PDM/PLM functions

Systems used i.e. dependent on:

- SAP
- Solid Works
- xPLM
- EPLAN P8
- Catia V5
- Etc.

Criteria (amongst others)

- Experience in the field of
 - classification systems
 - ecl@ss
 - CAx
 - SAP
- A provider for all products / catalogs
- Simple and homogeneous user interface
- Limited customization in the SAP system
- Handling of large assemblies
- Features such as conversion, start-up, geosearch
- Direct contact with the system house
- Overall costs, low-priced solution

Project order PSP: E.000105

- Project management: R&D
- Project team: R&D, Global Supply, Operations and maintenance, Support centre, etc.
- External adviser: D&TS; CADENAS, Itelligence AG



Project targets

- Using data from suppliers' catalogs
 - Material classification in SAP and PSOL
 - Improving / safeguarding data quality
 - Search optimisation within SAP
 - Avoiding duplicates
 - Based on international standards (e.g. eCl@ss; ETIM)
- Transparency in accordance with REpower terminology

What needs to be done within the project.....

- Analyse existing material master data
- Classify material master data; populate characteristics and characteristic values
- Check / update material - document links
- Plan, implement SAP customization and set up infrastructure
- Define processes; define / program interfaces
- Specify access rights and roles in SAP and PartSolutions
- Comprehensive integration tests
- Planning and preparing training courses
- Close contact with solution provider

- Ensure that your work convinces with regard to
 - model versioning and release
 - neutral, internally registered document numbers ("non-identifiable" ID)

The project: Project timeline

■ Classification of all material master data sets and commissioning of software environment

01/ 2011

**Project start
Kick-off**

06/ 2011

**Classification
finalised
Attributes
company parts
ready**

12/ 2011

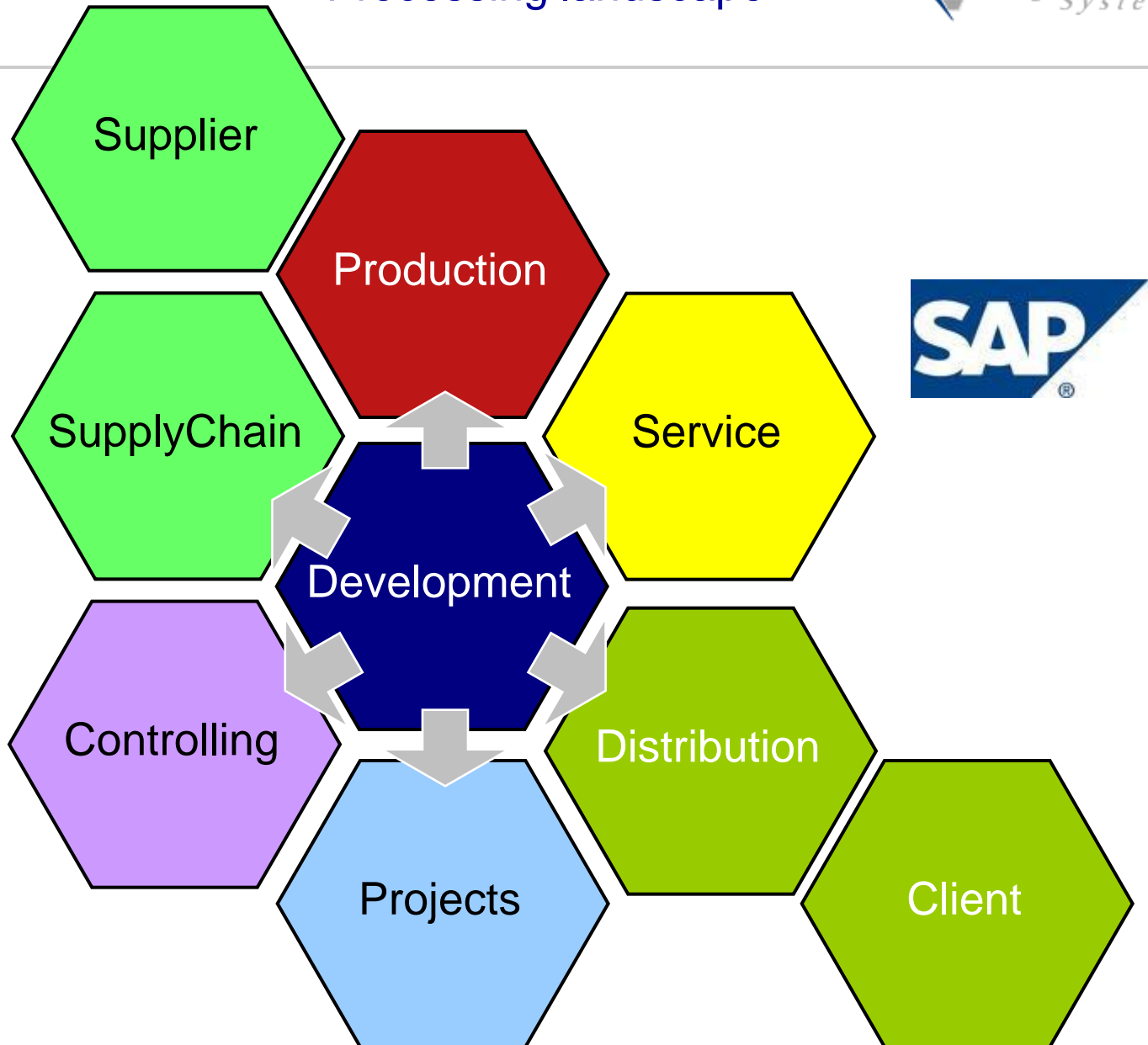
**Test phase
finalised**

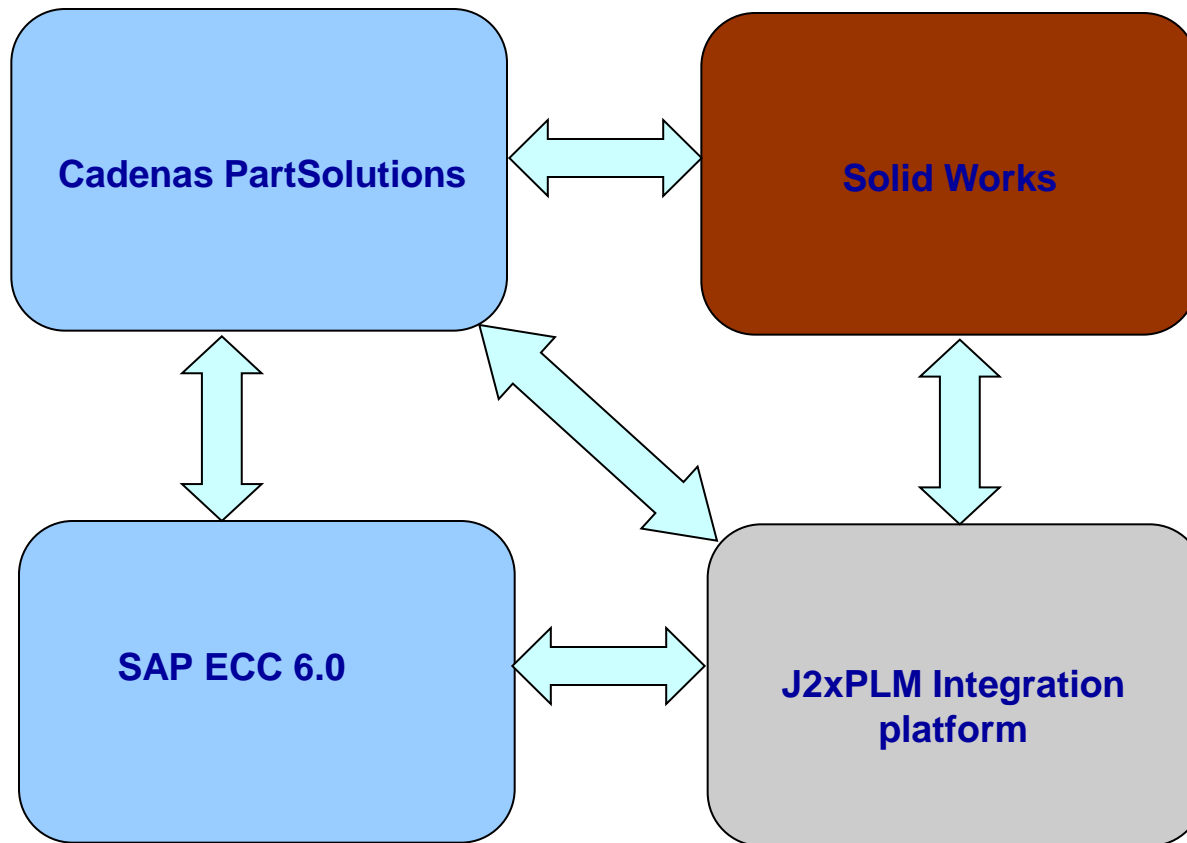
03/ 2012

GoLive

The project:

Processing landscape





Intermediate result

The screenshot displays the SolidWorks CAD environment. The top menu bar includes 'File', 'Edit', 'View', 'SAP', 'Insert', 'Tools', 'Window', and 'Help'. The 'SAP' button is circled in red. Below the menu bar is a toolbar with various icons. The main workspace is divided into three panes:

- Table:** A table with columns for material properties. Row 10 is circled in red.

	CHS000001 Länge [mm]	CHS000002 Breite [mm]	CHS000003 Höhe [mm]	CHS000004 Dicke [mm]	CHS000005 Außendurchm...	CHS000006 Inwenddurchm...	PE_VRKSST Werkstoff	PE_JNORMT Norm	PE_BRGEW Bruttogewicht	PE_NITGEW Nettogewicht	PE_MSTAE Materialstatus
1									90,000	65,000	E
2	800,000	115,000	100,000	8,000			S235JR		12,000	12,000	F
3									0,375	0,375	F
4							Polyamid		100,000	100,000	FE
5									375,000	375,000	FE
6									100,000	100,000	FE
7	527,525	400,000	60,000	6,000					8,700	8,700	F
8							S235JR	DN 1017	0,000	0,000	FE
9							S235	DN 1017	0,000	0,000	FE
10	391,235	150,000	60,000	6,000			S235JR02		2,001	2,001	FE
11									0,101	0,101	FE
12									300,000	300,000	F
13									0,000	0,000	FE
- 3D Model:** A 3D rendering of a curved metal part with a red circle highlighting a specific feature.
- Technical Drawing:** A 2D technical drawing of the part, with a red circle highlighting a dimensioned section. The drawing includes labels like 'gerechnete Länge / fact length = 50mm' and 'Innenverbleib / fact dp guaranteed'.

On the right side, a vertical menu is open, listing various functions in German:

- Verbindung aufbauen
- Verbindung beenden
- Dokument laden
- CAD-Manager
- Aktives Dokument versionieren
- Aktives Dokument kopieren
- Rekursive Funktionen
- Zeichnungskopf aktualisieren
- PDF-Datei erzeugen
- Dokument anzeigen
- Produktstruktur anzeigen
- Hilfsfunktionen
- Info
- Customize Menu

Steps towards GoLive

- ▶ more than 23,700 (+6,000 Delta) materials classified
- ▶ approx. 6,000 3D-models read, converted and linked
- ▶ interfaces defined; programming / fine tuning in progress
- ▶ produce training course documentation / prepare training courses

Using hierarchic class searches

Objekte in Klassen suchen

Suche in Einstiegsklasse | Suche auch in Unterklassen | Nachselektion

Klassenstruktur

Klassenstruktur	Kurztext
001 RECL@SS	Basisklasse
001 14000000	Logistik (Dienstleistung)
001 15000000	Instandhaltung (Dienstleistung)
001 17000000	Maschine, Apparat (besondere Anwend.)
001 19000000	Info-,Kommunikations-,Medientechnik
001 20000000	Packmittel
001 21000000	Ausstattung,Werkzeug,werkstatteinrich.
001 22000000	Bautechnik
001 24000000	Büro-,material,einricht,techn,Papeterie
001 25000000	Allgemeine Dienstleistung
001 26000000	Energie, Gewinnungsprodukt, Sekundärroh
001 27000000	Elektro-,Automatis-,Prozessleittech.
001 28000000	Fahrzeugtechnik
001 29000000	Hauswirtschaft, Hauswirtschaftstechnik
001 30000000	Hilfsstoff, Additiv, Reinigungsmittel
001 31000000	Polymer
001 32000000	Labormaterial, Labortechnik
001 33000000	Anlage (komplett)
001 34000000	Medizin, Medizintechnik
001 35000000	Halbzeug, Werkstoff
001 36000000	Maschine, Apparat
001 37000000	Rohrleitungstechnik
001 38000000	Anorganische Chemikalie
001 40000000	Arbeitssicherheit, Unfallschutz
001 41000000	Marketing
001 90000000	Interimsklasse (nicht spezifiziert)

Einstiegsklasse

Klasse: RECL@SS Basisklasse
 Klassenart: 001 Materialklasse

Merkmale

Allgemein

DIN	Merkmalbezeichnung	M..Wert	I
	Hersteller-Artikelnummer		+
	Hersteller-Name		
	Lieferanten-Name		
	Lieferanten-Artikelnumm...		
	Länge		
	Breite		
	Höhe		
	Dicke		
	Außendurchmesser		
	Innendurchmesser		

Hierarchic class search

Geosearch

The screenshot displays a software interface for hierarchical class search. On the left, a tree view shows a hierarchy of parts under 'Kataloge'. The selected item is '23-11-01-01 Schraube, flach aufliegend, Außenantrieb'. The right pane shows a list of search results, all labeled 'Classification...' with various part numbers.

The screenshot displays a software interface for geometric search. The 'Suchoptionen' window is open, showing search criteria and options. Below, a table of search results is shown with columns for Ranking, Firmenlogo, Katalog, Vorschau, 3D Form A, 3D Form B, 3D-Größe, Name, ERP-Nummer, and Materialnumm.

Ranking	Firmenlogo...	Katalog	Vorschau [...]	3D Form A ...	3D Form B ...	3D-Größe	Name	ERP-Nummer	Materialnumm
1	REpower	Classification@...		100%	100%	100%	23-14-03-90 Kabelschell...	00000000000002...	000000000000
2	REpower	Classification@...		96%	93%	98%	23-14-90-90 Schelle (so...	00000000000003...	000000000000
3	REpower	Classification@...		83%	93%	83%	35-01-05-01 Blech (Stah...	00000000000003...	000000000000
4	REpower	Classification@...		76%	93%	88%	23-90-02-29 Welle	00000000000002...	000000000000
5	REpower	Classification@...		77%	92%	89%	21-04-07-90 Meißel, Kör...	00000000000003...	000000000000
6	REpower	Classification@...		76%	88%	96%	21-04-07-90 Meißel, Kör...	00000000000003...	000000000000

GoLive qualities

- ▶ Import of electronic data from catalogs during data creation process
- ▶ Continuous management process via CAD-xPLM-PSOL-SAP
- ▶ Improved data quality and management information with regard to material master
- ▶ Fast search and location of parts / assemblies
- ▶ Company-wide access to classification data in SAP and PSOL
- ▶ Integration into existing data creation process
- ▶ Automation possibilities



REpower as a business and its products



CAD use, actual and target



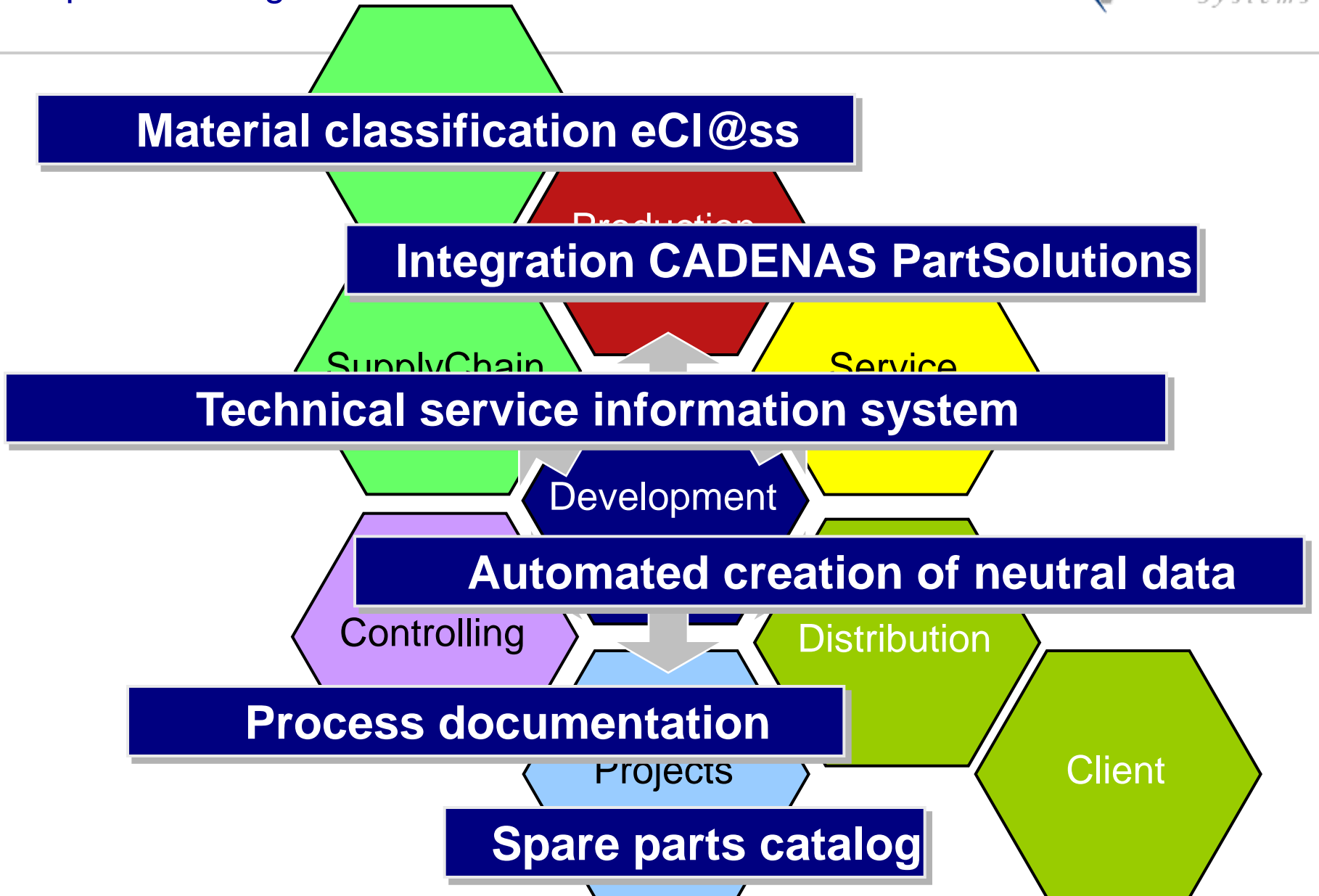
The project



Expansion stages



PSOL Key-Features / Cooperation with D&TS / CADENAS





REpower as a business and its products



CAD use, actual and target



The project



Expansion stages



PSOL Key-Features / Cooperation with D&TS / CADENAS

Excellent features

- ▶ Integration of a large number of supplier catalogs
- ▶ Minimal customizing in SAP (using standard functions MM)
- ▶ System configuration via parameter files
- ▶ Product transparency for engineers and buyers
- ▶ Allows for data transparency (Avoid duplicates)
- ▶ Simple and homogeneous operation

- ▶ A wealth of experience in this field
- ▶ Continuous project support
- ▶ Close cooperation with regard to solution design
- ▶ Open-minded about "new", still to be developed, requirements
- ▶ Extremely satisfied with the qualified support

Thank you for your attention

Any questions?



Dipl.-Ing. FH

Alexander Schulz

Head of technical service department
(PDM / PLM)

REpower Systems SE
Albert-Betz-Straße 1
D-24783 Osterrönfeld

Tel: +49-4331-13139-171
Fax +49-4331-13139-54
Mobile: +49-176-1662 8176
Email: alexander.schulz@repower.de
Internet: www.repower.de



© REpower Systems SE

All rights reserved. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photography, recording, or any information storage and retrieval system, without permission from REpower Systems SE.