

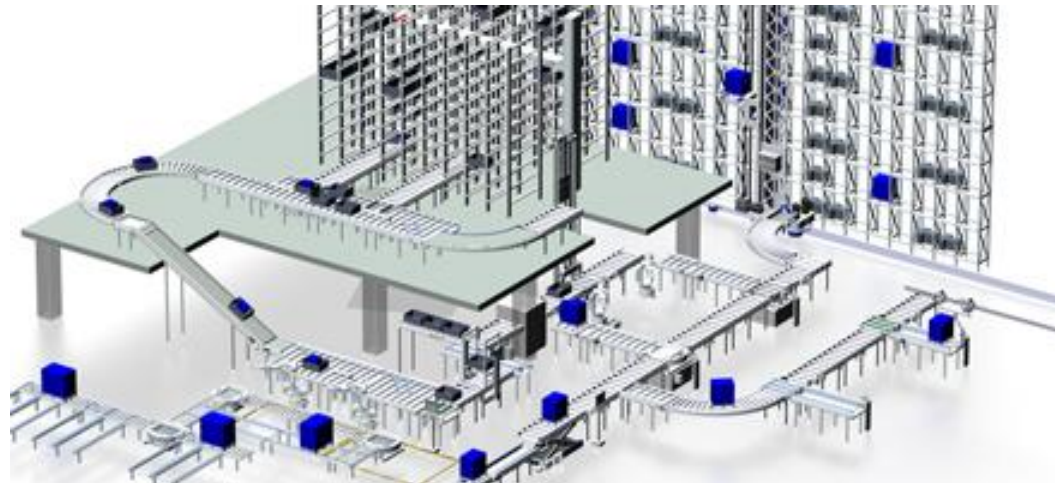
# Intelligent motion control for energy efficient intralogistics

(itsowl-IASI)

Prof. Dr. Holger Borchering

*Technical Head of Innovation*

2012/05/21





Lenze at a glance

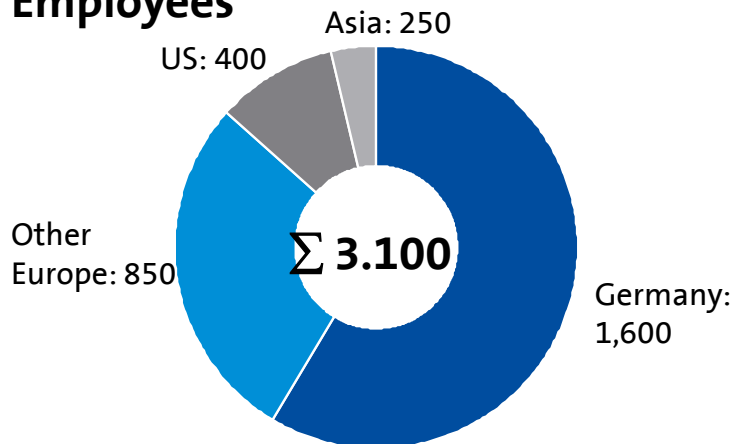
# Lenze Group as drive & automation specialist

*with long tradition*

## Financial facts & figures 2010/2011

- ▶ **Sales:** 567 mn €
- ▶ **Investment (R&D and Capex):** 44 mn €
- ▶ **Operating result** before interest, taxes and extraordinary effects: 48 mn €
- ▶ **Equity quota:** 58%

## Employees



## Value proposition & positioning

- ▶ **Competency:** Specialist for drive & motion centric automation products and technology
- ▶ **Customer-orientation:** Customer needs and requirements as key focus of all activities, with Lenze as proven partner for customer specific products & solutions also
- ▶ **Broad offer portfolio:** Development, production and sales of innovative products, comprehensive solutions and entire systems for drive and automation technology
- ▶ **Tradition & trustworthiness:** Company history of more than 60 years as family-owned business with long-term investment focus, strong balance sheet and clear values
- ▶ **Footprint:** more than 50 locations worldwide

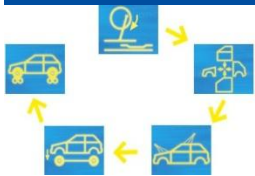


# Lenze Group as valued partner

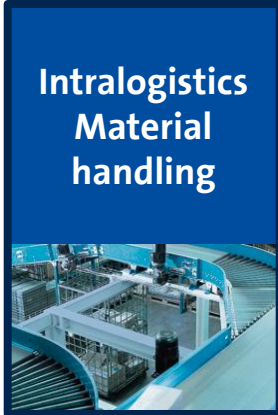
*in many applications & products*

## Factory automation

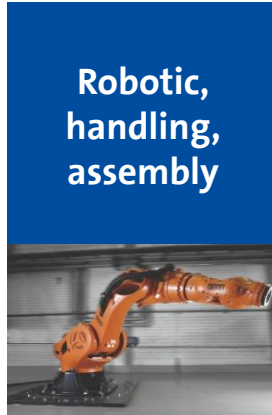
Automotive production lines



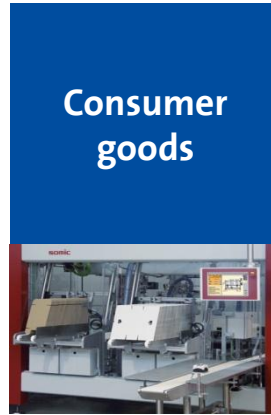
Intralogistics Material handling



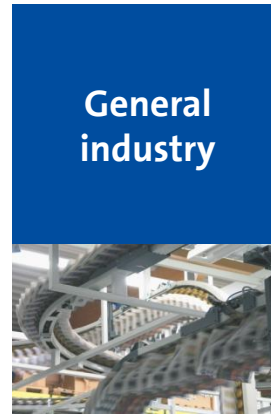
Robotic, handling, assembly



Consumer goods



General industry



Electro mobility

Busses & light trucks



Software & controls



Electrical drives



E-motors



Transmission / geared motors

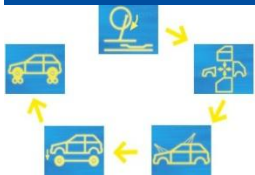


# Lenze Group as valued partner

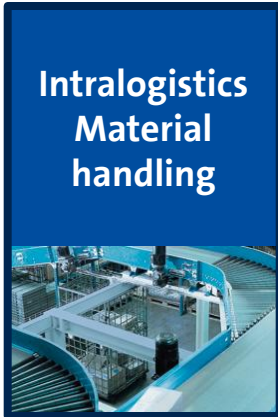
*in many applications & products*

## Factory automation

Automotive production lines



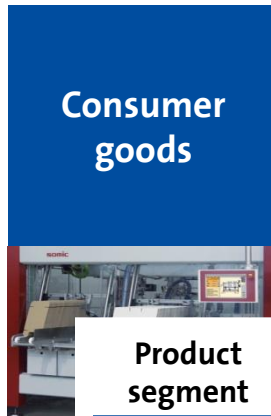
Intralogistics Material handling



Robotic, handling, assembly



Consumer goods



General industry



Electro mobility

Busses & light trucks



Product segment

Example

Global production volumes

Servo drives



>200,000 units p.a.

Inverter drives



> 450,000 units p.a.

E-motors/ transmissions



>350,000 units p.a.

Software & controls



Electrical drives



E-motors



Transmission / geared motors

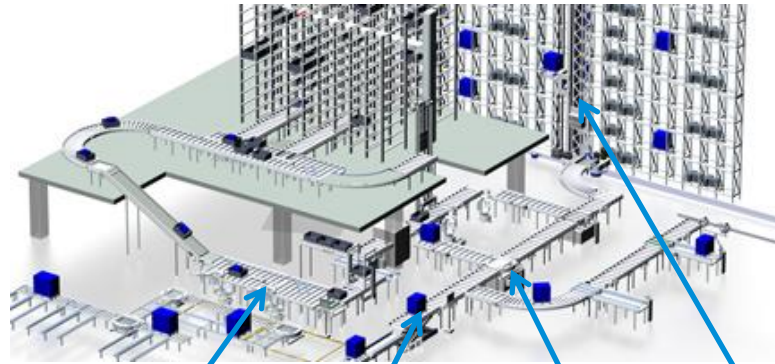




itsowl-IASI:  
Project objectives

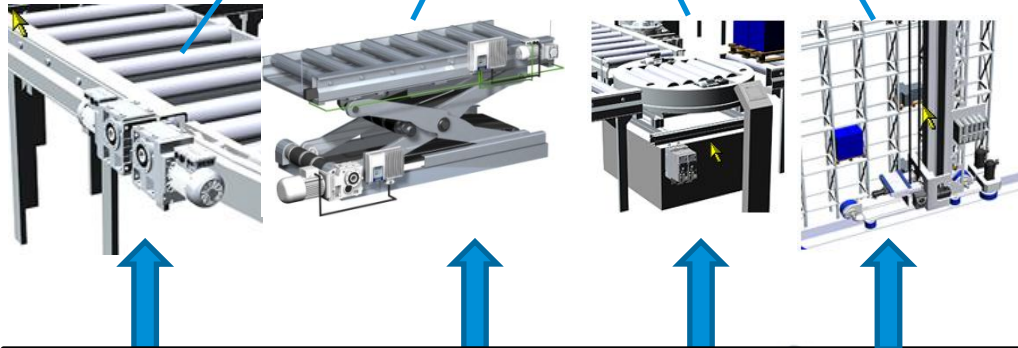
# Project objectives: Energy efficiency in an automated warehouse

Control level:  
Intralogistic systems



itsowl-IASI Partners:  
Lenze SE,  
Weidmueller Interface,  
IOSB-INA, init, Power  
Electronics and Drives  
Lab (LLA),  
aia automation institut

Process level:  
Applications



Duration:  
2012-2015  
Investment:  
4.3 mn €

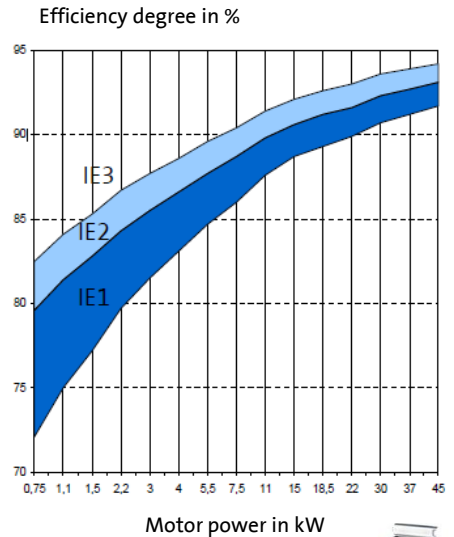
Sensor/actor level:  
Components



# Sensors and actors

## Energy efficient components






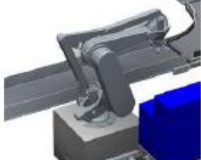


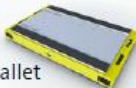

- ▶ Mechanics with low mass and friction
- ▶ Low-loss gearboxes
- ▶ Energy-efficient motors
- ▶ Inverter demonstrator with eco functionality (eco-modes, SMPS, communication, ProfiEnergy, ...)
- ▶ Self-optimizing energy saving drive controls



Energy-efficient drive components are of utmost importance



# Intralogistic applications

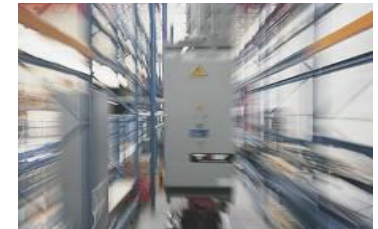
<p>Roller conveyor</p> 	<p>Belt conveyor</p> 	<p>Turntable</p> 	<p>Belt transfer</p> 	<p>Chain transfer</p> 	<p>Accumulating conv.</p> 
<p>Goods lift</p> 	<p>Pallet magazine</p> 	<p>Transfer car</p> 	<p>AGV</p> 	<p>EMS</p> 	<p>Robot</p> 
<p>AS/RS (boxes)</p> 	<p>AS/RS (pallet)</p> 	<p>Load handling device</p> 	<p>Shuttle with hoist</p> 	<p>Shuttle</p>   boxes pallet	<p>Carouse / lift system</p> 

- ▶ Potential for energy savings in intralogistic applications
- ▶ Concepts for energy efficient applications
- ▶ Self-optimizing motion control

# System level

*completely energy efficient intralogistic systems*

- ▶ **Modular energy-efficient intralogistic system (components, applications, tools)**
- ▶ **Concepts for energy-efficient energy distribution in intralogistic systems**
- ▶ **Domain-comprehensive tool chain: Coupling of drive dimensioning, planning of low voltage installations and distribution, management systems**
- ▶ **Prototype of real-time energy management**
- ▶ **Use of braking energy (recovering, exchange, storage)**
- ▶ **Validations in real warehouses**



**As easy as that.**

**Lenze**