PAST – PRESENT – PROSPECTS
AGENDA

09:30 am  WELCOME  Dirk Engel, Jan Kroeger

09:45 am  PAST – PRESENT – PROSPECTS PRESENTATION / Q & A

  BUSINESS MODEL AND STRATEGY  Dirk Engel
  TRENDS AND MARKETS  Hendirk Niestert
  EXCELLENCE AND EFFICIENCY  Peter Hirsch

11:00 am  COFFEE BREAK
AGENDA

11:30 am
APPLICATIONS AND POTENTIALS PRESENTATION / Q & A
PLASTICS PROCESSING INDUSTRY Nico Kuels
LASER AND MACHINE TOOL INDUSTRY Dirk Boevingloh
MEDICAL TECHNOLOGY Denis Roessel
E-MOBILITY Christian Walczyk

01:00 pm LUNCH BREAK
01:45 pm THE NEW TERMOTEK PLANT SITE VISIT Peter Hirsch
03:00 pm COFFEE BREAK
03:30 pm SUMMARY OF THE DAY Dirk Engel
Jan Kroeger, Dirk Engel

WELCOME TO BADEN-BADEN
INTRODUCTION

Jan Kroeger, Managing Director of termotek GmbH since October 1st, 2019

› Degree in Mechanical Engineering

› Managing Director of termotek GmbH since 01 October 2019

› Previous Positions:
  › General Manager
    GEA Group
  › International Sales Director
    York/Epta Group
TERMOTEK GMBH: FACTS AND FIGURES IN A NUTSHELL

› Refrigeration and cooling units
› Serial and customized products
› 130 employees
› 20,000 units per year
TERMOTEK: OUR PRINCIPLES

Modern  Innovative  Potential  Customer-Oriented
Technology  Lab  New Facility  Lean  Quality
Customization  Applications  Long-Term  Environment-Friendly
TERMOTEK: APPLICATIONS

Laser, Tooling, Security, Medical, E-Mobility and Analytics
BUSINESS MODEL AND STRATEGY
„We want to become a leading provider for customized solutions in the area of fluid management.“
Business Model

Technology

Fluid Management
1. Cooling and temperature control
2. Filtration and separating
3. Pumping and spraying

Growth Strategy

› Organic growth
› Focussed M&A activities

International Network

› 19 worldwide locations
› 6 production plants (GER, China, US)
› Sales & services

Balanced Portfolio

1. Print
2. Plastics
3. Laser, tooling, stamping/forming
4. Growth markets
5. Technical documentation

Broad Customer Basis

› OEMs
› End customers

Customized Solutions

› Projects
› Small / mid-sized serial products
Strategic objectives:
› Realisation of **profitable growth**
› **Diversification** of revenue/profit contributors based on core competences
› **Control of risk**

Realisation of „balanced growth“:
› Organic growth
› Acquisitions

Performance 2019:
› High dynamics in growth markets
› Weaker EBIT 2019 due to lower revenue contribution of gwk, expenses for further growth and general cost inflation of about 2-3%
› Measures set to increase profitability and efficiency
2009 – 2018: REALISATION OF BUY AND BUILD STRATEGY

**Group revenue**

- **2009**: 82 m€
- **2011**: 97 m€
- **2014**: 112 m€
- **2017**: 205 m€
- **2018**: 216 m€

**Milestones**

- **termotek** (2013)
- **klh** (2013)
- **gwk** (2016)
- **Reisner/ Hahn**

**Group revenue share**

- **2009**: 100% Print
- **2011**: 86%
- **2014**: 67%
- **2017**: 42%
- **2018**: 38% Print, 29% Plastics, 20% Laser, 3% Techn. Doc.

**Markets**

- 42% Growth Markets
- 3% Techn. Doc.
### Production Sites

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<td>technotrans SE (D)</td>
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<td>gwk GmbH (D)</td>
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<td>termotek GmbH (D)</td>
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<td>klh GmbH (D)</td>
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<td>Reisner GmbH (D)</td>
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<td>technotrans Taicang (CHI)</td>
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### Sales and Services Network

- Production sites

### Stability due to Application & Technology/Services Spread

![Graph showing share of group revenue from 2009 to 2019](image)
ROBUST SETUP IN A VOLATILE ENVIRONMENT

MAJOR TRENDS IN OUR MARKETS

- Print
  - Digitalisation / individualisation
- Plastics
  - Structural changes automotive
- Laser
  - Technological progress
- Growth Markets
  - Technological progress/regulation
- Tech. Documentation
  - Digitalisation / regulation

OUR SETUP

- Solutions for all print techniques, high market share achieved
- Acquiring new clients outside automotive, gaining market share
- Close client cooperation, full-liner principle
- Continuously scanning of growth opportunities; engineering power
- Continuous business development

FOCUS ON ENERGY-EFFICIENT SOLUTIONS AND SUSTAINABILITY
M&A: GOOD OPPORTUNITIES FOR BOLT-ON ACQUISITIONS

New markets
  › Diversification of customer basis
  › New markets
  › New applications

Strategic supplements
  › New Technology
  › Niche position
  › Own industrial added value

Internationalisation
  › Enhance global footprint regarding
    - markets
    - customers
    - production

- Temperature Control is an important technology for various industrial processes
- The requirements are increasing
- Multi-track approach to identify value creating targets
- technotrans’ relevant industries are fragmented with various opportunities for buy and build
THE CURRENT ENVIRONMENT – CHALLENGES INCREASING

- Trade conflict
  USA-China
- Slowed down economic growth
- BREXIT
- Geopolitical threats
- UNCERTAINTY
- Fear of recession
- Environmental focus
- Structural changes automotive industry
OUR ROBUST AND FLEXIBLE SETUP

Key technology competence

Solid financial position

Diversified portfolio

Focus on sustainability

Clear business model

Skilled engineers

Dedicated salesforce

FLEXIBILITY
OUR PILLARS OF VALUE CREATION AT TECHNOTRANS

Growth
- Technology trends
- Sales excellence
- Lifetime Services

Cost Efficiency
- Establishment of single- and multi-purpose sites (manufacturing footprint)
- Increase utilization, flexibility and quality
- Operational excellence, consolidation of production volume and realization of synergy potential
- Reduce complexity and fix cost basis

Pillars of value creation at technotrans
HENDIRK NIESTERT

TRENDS AND MARKETS
THE YEAR 2000 - EXPECTATIONS OF PEOPLE IN 1900
ADOPTION RATE OF TECHNOLOGIES DECREASING RAPIDLY

Time from introducing a product to an adoption rate of 25% across US citizens [years]

- Electricity (1873): 46 years
- Telephone (1876): 35 years
- Radio (1897): 31 years
- TV (1926): 26 years
- PC (1975): 16 years
- Mobile phone (1987): 13 years
- World Wide Web (1991): 7 years
- Facebook (2004): 4 years

Source: FAZ
EXAMPLES: IMPACT OF TECHNOLOGICAL PROGRESS ON BUSINESS MODELS
THE CURRENT BUSINESS ENVIRONMENT

V
Volatility

Increased speed and amplitude of changes

U
Uncertainty

Lack of predictability of the changes

C
Complexity

Increased complexity of systems and correlations

A
Ambiguity

Missing causes and correlations
SNAPSHOT MEGATRENDS: CHALLENGES WHERE THE FUTURE IS BORN

- Work Life Balance
- Silver Society
- Individualisation / Mass Customisation
- New mobility
- Scarcity of resources
- Climate change / Sustainability
- Dynamic technology and innovation
- Urbanisation
- Business process automation
- Knowledge Culture
- Demographic dynamics
- Global knowledge society
- Life sciences
- Healthcare
- Genetic Engineering
- Digital transformation
- VR (Virtual Reality)
- AR (Augmented Reality)
- IoT (Internet of Things)
- AI (Artificial Intelligence)
- Connectivity / Connected consumer
- Pay per use / Sharing economy
- Security / Data protection / Trusted Brand
- Material waste -> waste Material
- Platform Economy
OUR SALES STRATEGY (PRESENT – FUTURE)

- **INCREASE MARKET SHARE**
  - Maintain and where possible extend market share with existing customers
  - Gain market share with new customers in existing markets
  - Early technical involvement with a consulting approach and prototype delivery is the seed for the future

- **BE INNOVATIVE**
  - Big enough to deliver – small enough to care
  - Technical advanced solutions / customized products
  - Business with mid size serial production
  - Project business in known technical areas

- **FOCUS ON MARGINS**
  - Develop revenues with customers in sweet spots (= well chosen niche markets)
  - Acquire new service business
MEGATREND INVOLVEMENT OF TECHNOTRANS

**Megatrends**
- **Individualisation / Mass Customisation**
  - 3D Print
  - Digital printing
  - Packaging
  - Railway sector
  - Bus sector
  - Converter / power grid
  - Charging stations
  - Lightweight vehicle
  - Semi finished products for battery cells
- **Life sciences**
  - Glasses manufacturing
  - Aesthetic surgery (Tattoo removal / Eye surgery)
  - Implants / 3D Print
  - Surgery equipment
  - Analytic equipment
  - Scanner equipment
- **Healthcare**
  - Data Center Cooling
  - Next level computer chips
- **Digital transformation**
  - Data Center Cooling
  - Next level computer chips
- **IoT (Internet of Things)**
  - Data Center Cooling
  - Next level computer chips
- **AI (Artificial Intelligence)**
  - Next level computer chips
  - Data Center Cooling
- **Connectivity / Connected consumer**
  - Production equipment for devices
  - Next level computer chips
  - Data Center Cooling
- **Security / Data protection / Trusted Brand**
  - Security printing
  - Scanner equipment
  - Packaging
- **New mobility**
  - Low GWP F-Gas
  - Natural F-Gas
  - Energy efficient products
  - Power to X
  - Fuel cell production
  - Hydrogen production
  - Charging stations
  - Public Transport
- **Climate change / Sustainability**
- **Scarcity of resources**
- **Urbanisation**
Planted seeds in megatrends have reached the TOP 10 customer list!

### Top 10 Customer revenue share 2018

<table>
<thead>
<tr>
<th>Revenue share</th>
<th>Relevant Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 OEM</td>
<td>12.40%</td>
</tr>
<tr>
<td>2 OEM</td>
<td>5.90%</td>
</tr>
<tr>
<td>3 OEM</td>
<td>3.90%</td>
</tr>
<tr>
<td>4 OEM</td>
<td>3.40%</td>
</tr>
<tr>
<td>5 OEM</td>
<td>1.60%</td>
</tr>
<tr>
<td>6 OEM</td>
<td>1.50%</td>
</tr>
<tr>
<td>7 OEM</td>
<td>1.40%</td>
</tr>
<tr>
<td>8 OEM</td>
<td>1.10%</td>
</tr>
<tr>
<td>9 OEM</td>
<td>0.80%</td>
</tr>
<tr>
<td>10 OEM</td>
<td>0.80%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OEM</th>
<th>Revenue share</th>
<th>Relevant Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEM 1</td>
<td>60% Mobility</td>
<td></td>
</tr>
<tr>
<td>OEM 5</td>
<td>40% Medical &amp; Analytics</td>
<td></td>
</tr>
<tr>
<td>OEM 3</td>
<td>90% Laser</td>
<td></td>
</tr>
<tr>
<td>OEM 4</td>
<td>90% Print</td>
<td></td>
</tr>
<tr>
<td>OEM 7</td>
<td>90% Laser</td>
<td></td>
</tr>
<tr>
<td>OEM 9</td>
<td>80% Laser</td>
<td></td>
</tr>
<tr>
<td>OEM 10</td>
<td>80% 3D Print</td>
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</tbody>
</table>
REVENUE DEVELOPMENT STRATEGY

2018

- 38% Print
- 29% Plastics
- 20% Laser
- 3% Techn. Doc.

Group revenue share

Group revenue in € mn

216 € mn

2022

- 38% Print
- 29% Plastics
- EM
- M&A

Group revenue share

Group revenue in € mn

250 € mn

2025

- 38% Print
- 29% Plastics
- EM
- NN
- M&A

Group revenue share

Group revenue in € mn

>300 m€

EM=E-Mobility

NN = Potential
RECAP: THE CURRENT BUSINESS ENVIRONMENT

- **Volatility**: Increased speed and amplitude of changes
- **Uncertainty**: Lack of predictability of the changes
- **Complexity**: Increased complexity of systems and correlations
- **Ambiguity**: Missing causes and correlations
OUR SETUP: VUCA AT TECHNOTRANS

Vision
We have substantial growth potential with our technology in the upcoming megatrends.

Understanding
We understand the market changes and have the flexibility to adapt.

Clarity
We clearly communicate and learn from our experience.

Agility
We are acting agile and develop solutions close to our customers’ needs.
EXCELLENCE AND EFFICIENCY

PETER HIRSCH
TECHNICAL ROOTS OF TECHNOTRANS

Core competences: **Cooling and Filtration**

- Most of the business is related to print
- Well-established in key market
- Market leader
- Customer-initiated developments
- Medium and long-term developments
- Most products have a serial character
## TECHNICAL DEVELOPMENT OF TECHNOTRANS GROUP

<table>
<thead>
<tr>
<th>Company</th>
<th>Year</th>
<th>Cooling</th>
<th>Tempering</th>
<th>Filtering</th>
<th>Pumping/ spraying</th>
<th>Automated Dosing</th>
<th>Key Market</th>
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<tr>
<td>technotrans</td>
<td></td>
<td>4 – 60 kW</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Print</td>
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<tr>
<td>termotek</td>
<td>2011</td>
<td>0.1 – 16 kW</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Laser</td>
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<tr>
<td>Klh</td>
<td>2013</td>
<td>2 – 240 kW</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Machine Tools</td>
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<tr>
<td>gwk</td>
<td>2016</td>
<td>4 – 500 kW</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Plastics</td>
</tr>
<tr>
<td>Reisner</td>
<td>2018</td>
<td>60 – 1500 kW</td>
<td>X</td>
<td></td>
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<td></td>
<td>Various (Process)</td>
</tr>
<tr>
<td>gds / Sprachenwelte</td>
<td>2012</td>
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<td>Documentation</td>
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<tr>
<td>Ovidius</td>
<td>2016</td>
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Overlapping cooling capacities in the range from 2 – 240 kW

In cooling and tempering: **the technotrans group is a full-liner**
REALISATION OF SYNERGY POTENTIALS

- Pooling of group-wide purchasing potential
- Use of identical components
- Use of manufacturing competencies within the group

- Reduction of technological variances
- Streamlining of key technologies
- Group-wide technology transfer

- Identical main processes
- More streamlined processes
- Uniform ERP system
- Group-wide shared service support

- More flexible and adaptable production sites
- Focus on key products
- Lean production across all locations
Formation of a group-wide Lean Team (5 Lean Experts – one from each German site)

Identical training in methods and standards

Building interdisciplinary local teams with at least 2 of the experts to awaken creativity and ensure a continuous process

Supported and promoted by the board and local management

Focus on key products for highest effectivity (serial production)

Flexible according to a growing project business (multi-purpose site)

Transparent and lean structure for best efficiency

Requirements for future technotrans production
REDUCTION OF TECHNOLOGICAL VARIANCES

› 5 production sites: 4 in Germany, 1 in China
› 9 different series with mainly similar functions with cooling capacities ranging from 0.8 to 380 kW

UC series
cooling capacity: 1 - 5 kW

mako.series
cooling capacity: 1.1 - 7.3 kW

p800 series
cooling capacity: 0.8 - 13.5 kW

weco
cooling capacity: 1.5 - 380 kW

omega.line
cooling capacity: 6 - 60 kW

omega.eco-line
cooling capacity: 10 - 60 kW

taifun.line
cooling capacity: 12 - 54 kW

omega >75
cooling capacity: 75 - 300 kW

UC series
cooling capacity: 63 - 300 kW
THE TECHNOTRANS GROUP CHILLER

- **3-4 production sites**
  3 in Germany + 1 in China

- **4 different series**
  with two main configurations

- **1-13 kW**
- **14-60 kW**
- **75-120 kW**
- **150-330 kW**
**THE TECHNOTRANS GROUP CHILLER**

**PURE**

- Prototype implementation 2019
- Target product launch 2020
- Reduction of manufacturing costs
Innovation is the engine of the future

For technotrans as a technology company it is necessary to identify future trends and to derive promising product innovations within existing markets as well as new ones.

2020: Start of a guided innovation process

Engaging a groupwide “Director for Strategic Development”

Main tasks:
- creation of an interdisciplinary, groupwide development structure
- building central and decentral competence and development teams
- supporting the innovation process and identification of future-oriented technologies
SUMMARY

› technotrans is a full-liner in cooling and filtration

› It is necessary to exploit the full synergy potential of the group

› We have to streamline processes, products and technology

› The group-wide lean transformation will increase our effectiveness

› Innovation will ensure our technological leadership

**technotrans moves forward and will be successful!**
APPLICATIONS AND POTENTIALS
PLASTICS – COMPETENCE OF TECHNOTRANS AT A GLANCE

› Starting time at technotrans: 2016
› Centres of competence: gwk (2016) and Reisner (2018)
› Share of group turnover: 29 %
› Key competences:
  - Cooling
  - Temperature Control
  - Water technology
  - Service
Turnover development as a member of the technotrans group
APPLICATIONS: MODULAR SOLUTIONS FOR OEMs

Product range: Modular temperature controllers up to 220°C / 400°C
Applications: OEM rubber and plastic (extrusion and presses)
APPLICATIONS: CONTAINER SIZED SOLUTIONS

Product range: Energy saving cooling system
Applications: Processors (injection moulding, extrusion, metal and food)
APPLICATIONS: COMPACT SYSTEMS

Product range: Compact temperature controllers
Applications: Plastics, rubber and food (injection moulding and extrusion)
MARKET – RELEVANT SEGMENT

Target group

- Injection moulding
- Extrusion
- Further app plastics
- Metal
- Chemistry
- Food

Customer contact

- Direct
- Indirect
- Factory
- Constructors
- Mould-maker

Requirements

- Sales
- Subsidiaries
- Reps
- Industry
- Key-account
- Product
- Builders

Heating
Cooling
Cleaning
CUSTOMER STRUCTURE – SALES BY MARKETS

- Plastic: 70%
- Metal: 9%
- General machine industry: 8%
- Chemistry & pharmacy: 8%
- Others: 5%
- Injection moulding: 58%
- Extrusion: 28%
- Further application plastics: 14%
MARKET – KEY DRIVERS AND OUTLOOK

› Automotive industry: structural changes
› BREXIT threat
› Trade conflict USA and China
› Environmental reputation of plastics
› Increasing competitive pressure
Positive business expectation in the extrusion market
Business possibilities for energy saving and low carbon technology
International market volume potential
Growing markets with high-end-technologies
Increasing quality consciousness
Compact temperature controllers
Injection moulding, extrusion and rubber processors and OEM

Modular temperature controllers
Extrusion and presses
OEM

Low temperature chillers
Webcoating and test benches
OEM

Water flow controllers
Injection moulding / OEM

Temperature controllers
Test benches for sensoric and semiconductors

Service
Intercompany worldwide

Dynamic temperature control systems
Processing of particle foam processors and OEM

Cooling plants
Plastic, metal and food processors

Waste heat to energy / Renewable energy storage

GROWTH POTENTIAL OF PLASTICS DIVISION
DIRK BOEVINGLOH

LASER AND MACHINE TOOL INDUSTRY
LASER AND MACHINE TOOL INDUSTRY AT A GLANCE

› Starting time at technotrans: 2011 (acquisition of termotek)
› Centres of competence:
› Share of group turnover: 20 %
› Turnover development: (2018)
  From <€ 10mn (2012) to >€ 40mn
› Key competences:
  Cooling: High end solutions for all types lasers and metal working machines
    - full liner -
  Filtration of cooling lubricants for metal working machines
MARKETS AND APPLICATIONS - OVERVIEW

- Cutting
- Grinding
- Welding
- Additive Manufacturing
- Turning / Milling
- Induction Heating
- EUV Lithography
APPLICATIONS: COOLING SOLUTIONS FOR LASER SYSTEMS

› standardized chillers, which can also be adapted to customer requirements

› Precise cooling of laser machines e.g. resonator (laser source), optics (lenses) for focusing the laser beam and various internal cooling circuits

› Energy-efficient cooling solutions

› High-precision temperature control of ± 0.1 K

› cooling capacity range from 1.5 kW to approx. 65 kW
APPLICATIONS: CUSTOMIZED CHILLERS FOR THE LASER INDUSTRY

- Customized Solution
- Fully integrated
- Production in Germany and China
- 5 power ratings (10, 12, 17, 25, 35 kW)
- Supply up to 3 circuits (cooling of laser, optics and motor)
- DI-water compatible (conductivity controlled)
APPLICATIONS: COOLING FOR MACHINE TOOLS

› Narrow tolerances in the micrometer range require constant temperature ranges for all moving parts

› Precise cooling for motors, linear drives, spindles, machine beds, switch cabinets and cooling lubricants is necessary

› Active cooling with liquid (water, oil or emulsion, etc.)

› Cooling and temperature control range from 1.5 to 65 kW
APPLICATIONS: COOLING & FILTRATION FOR MACHINE TOOLS

› Additive manufacturing („3D Printing“)
› Hybrid-Machine Lasertec 65 combines:
  › Laser deposition welding
  › Fully-featured five-axis milling machine
› Our toolsmart combines cooling and filtration for the hybrid machine and replaces 4 individual units

CUSTOMIZED MACHINE TOOLS COOLING & FILTRATION

2x Chiller (without cladding plates) + Filtration 50µm + Filtration 10 µm = Combination Unit
APPLICATIONS: EUV - THE FUTURE OF THE SEMICONDUCTOR INDUSTRY

„The number of transistors and resistors on a chip doubles every 24 months“ (Gordon Moore, Intel)

- EUV-Lithography-Systems for chip production
- Radiation at larger angles onto the wafer increases the resolution
- High-precision customized cooling solution
- Supply of 2 circuits (cooling of laser and domestic water circuit)
- Close cooperation with the customer during development
- 15 kW cooling capacity with a control accuracy of +/- 0.5 K

† EUV: Extreme Ultra Violet Radiation
Energy-efficient design with ...

...speed controlled main components

Continuous adaption of operating parameters

Dynamic adjustment of control accuracy

Highly precise temperature control from $\pm 0.1$ K

Integration into customer control system

Worldwide service and system partner for the OEMs
HEALTH CARE AND ANALYTICS

› Starting time at technotrans: 2011 (acquisition of termotek)
› Centre of competence: termotek GmbH
› Share of group turnover: 5 %
› Turnover development: > 20% CAGR
› Key competences: State of the art cooling
PRODUCTIONS AND SOLUTIONS

Urology - Surgical System

Ophtalmology - Surgical System

Analytics – Liquide chromatography

Life science beauty - Skin rejuvenation

Ophtalmology - Surgical System

Analytics – Liquide chromatography
The cooling system cools the body’s built-in nasal heat exchanger.

- Direct evaporator cooling principle
- Portable and battery operation ready

The system offers an unbroken cooling chain, application in an emergency or intensive care unit.

- From emergency up to the intensive care unit
- Small and compact light
- Tailored to the customers application
The cooling system cools the organ vessel by air to avoid freezing damage of tissue

Portable and battery operation

Cold storage of donated hearts

The new method increases the time a heart can be stored outside of the body

Small, compact and light

Tailored to the customers application

Low power consumption for battery operation
Active cooling system for medical laser dedicated to BPH and urology treatments

Switch quickly from cutting to coagulation

Smallest customised chiller on the market

Based on our new speed driven technology
Active cooling system for head cooling and oral mucosa

Treatment of concussive and sub-concussive brain injury

Smallest customised compressor chiller

Based on our new 24VDC technology
POTENTIAL: VARIOUS MEDICAL ISSUES REQUIRE OUR COMPETENCE

Capabilities of technotrans

› Supply of modern high quality customized solutions

› Comply with new regulations according natural gas (refrigerant)

› Providing new technologies to improve energy-efficiency

› Deep market knowledge

› Analytics
› Urology
› Ophthalmology
› Life Science
› Pain Therapy
› Adverse effects of cancer treatment
CHRISTIAN WALCZYK

E-MOBILITY@TECHNOTRANS GROUP
E-MOBILITY@TECHNOTRANS GROUP

› Activities started at technotrans: 2012

› Centres of competence: technotrans SE, termotek GmbH

› Share of group turnover: >4 %

› Development since start: Initial project was Siemens-QEC, Qatar;

  as

  identification & development of battery and vehicle manufacturers OEMs; now established partner for global players;

  annual growth rate between 20 - 30%

› Key competences: - Cooling

  - Temperature Control
MARKETS AND APPLICATIONS

- E-busses
- Trams & regional trains
- AGV, airport, mining, ...
- HPC charging
- Charging boxes
- E-bus charging
- Rail converters
APPLICATIONS: ROAD

zeta.road X40

- BTMS – Battery Thermal Management System for Li-Ion batteries
- Modular concept to fulfil a wide range of project, battery and vehicle variations
- Street applications: e-bus, trolley bus, e-trucks, harbour vehicles, airport vehicles, ...
- Ready to use with high flexibility for customers – especially in project start, ...
zeta.rail 50

› BTMS: Battery Thermal Management System
› Independent cooling system for a wide range of technically and climatically applications
› Area of operation: trams, trains, locomotives
› Validated and certified serial unit for rail applications
APPLICATIONS: HPC CHARGING

P70300

› Cooling unit for fluid cooled HPC charging cables

› Compact and modular design for the integration into the HPC charging station

› Charging station for electrical cars – able to charge up to 500kW in an extreme climatic conditions: from Scandinavia (-25°C) up to Dubai (+55°C)

› Designed (and proved) to operate with the main available HPC fluid cooled cables
Only in Germany there are more than 40,000 busses in daily operation.

Thereof only 250 e-busses.

Today more than 5,000 e-busses are in preparation/planning for operation in Germany.

40% of the German rail tracks are not electrified.

More than 3,000 diesel trains service these tracks.

Fuel cell & battery trains starting public operations.

Today: Large volume of retrofit projects in the UK, the Netherlands, Italy, ...
POTENTIAL: SPECIAL APPLICATIONS AND PASSENGER CARS

- Worldwide container harbours and airports operate with plenty of diesel vehicles

- First HPC installations offered location protection for service companies

- Now vehicles are on the market: Audi e-tron, Porsche Tycoon,

- Vehicles require infrastructure density
Major drivers of the growth: Li-ion cell costs & political pressure

Dropping battery prices reduce investment costs for e-vehicles and speed up diversification of e-mobility applications

Climate discussion leads to substantial (public & private) investments in e-mobility – technotrans provides the right solutions
SUMMARY OF THE DAY
CONCLUSION – WHY INVEST IN TECHNOTRANS?

Growth
› Technology trends
› Technology and application innovation
› Sales professionalization
› Service offering and delivering

Efficiency
› Productivity increase
› Manufacturing footprint optimization

Capital allocation
› Strong focus on free cashflow
› Disciplined working capital management
› Prudent Capex allocation

Sustainable value creation strategies targeting all key stakeholder groups
Customers / Employees / Investors / Society
SUMMARY – KEY MESSAGES

› ENVIRONMENT REMAINS CHALLENGING!
› WE REMAIN WITH FOCUS ON NICHE MARKETS!
› RE-SHAPE THE ORGANIZATION / INCREASED PERFORMANCE ORIENTATION!
(DEALING WITH A HIGH LEVEL OF COMPLEXITY)
› CASH GENERATION AND CAPITAL DISCIPLINE REMAIN KEY!
(EBITDA/WCM/CAPEX AND DIVIDEND/M&A/LEVERAGE)
› WE ARE COMMITTED TO OUR MID-TERM TARGETS!
› STRATEGY ROADMAP 2025 IN PREPARATION!
› OUTLOOK 2020: 50th ANNIVERSARY OF TECHNOTRANS!
Frank Dernesch
Manager Investor Relations & Corporate Finance

Tel. +49 (0)2583 301-1868
Fax +49 (0)2583 301-1054
frank.dernesch@technotrans.de
This presentation contains statements on the future development of the technotrans Group.

These reflect the present views of the management of technotrans SE and are based on the corresponding plans, estimates and expectations. We point out that the statements are subject to certain risks and uncertainties which could mean that the actual results differ considerably from those expected.
Member of the technotrans group