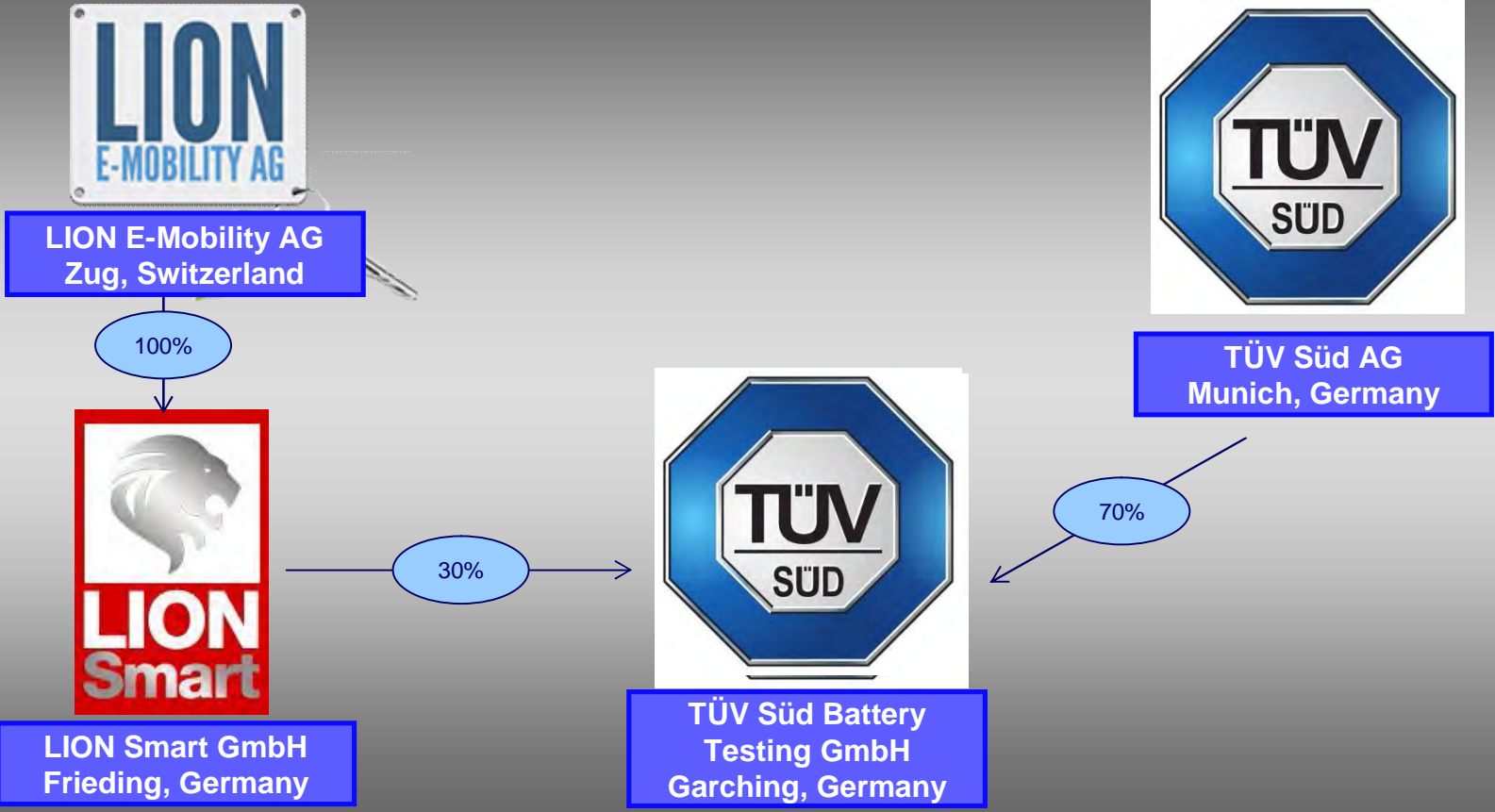




LION E-Mobility AG (WKN: A1JG3H, Ticker: LMI) is a Swiss holding company with promising strategic investments in the e-mobility sector, particularly in electrical energy storage and battery technology. The company owns 100% of German LION Smart GmbH, a developer of battery packs and battery management systems. LION Smart GmbH also holds a 30% share in TÜV SÜD Battery Testing GmbH, a promising joint venture with TÜV SÜD AG.

December 2011

Holding Structure



Company Executives

- **LION E-Mobility AG: Run by tax and legal experts Henley & Partners with executives Hans Fraats and Cees Jan Quirijns.**
- **The 100% owned subsidiary LION Smart GmbH is managed by highly skilled growth professionals Dipl.-Kfm. Winfried Mundl and Dipl.-Betriebswirt Harald Seemann who are also consultants to the AG and part of the investment committee.**
- **Joint Venture TÜV SÜD Battery Testing GmbH is managed by Dipl.-Ing. Daniel Quinger (Founder and Managing Director of LION Smart GmbH until the end of 2010) and Dipl.-Wi.-Ing. Stefan Rentsch (Head of e-mobility at TÜV SÜD AG until the end of 2010).**

LION E-Mobility AG Management

Cees Jan Quirijns

Cees Jan Quirijns is an international tax planning specialist and the managing partner of the H&P Trust Group. After graduating in Corporate and Tax law at the University of Maastricht in the Netherlands, he worked at a leading international tax consultancy firm in the Netherlands and the Netherlands Antilles. He subsequently joined the management team of the Swiss operations from a global fiduciary services firm. He is specialized in the incorporation and management of tax efficient corporate structures and the creation of trusts. He is the managing partner of the H&P Trust Group and he deals with complex planning issues for affluent and international oriented companies.

Hans Fraats

Hans Fraats is an international tax planning lawyer and a Partner at the firm's Zug office as well as a member of the board of H&P Trust Group. He is responsible for the Structured Solutions business, which focuses on the facilitation of tax efficient scenarios such as transactions with cash rich companies as well as other structured finance transactions. After graduating from the University of Maastricht in Business Economics and Tax Law, he started his career in 1997 as a tax consultant and worked several years for a leading corporate trust services provider. As a member of the board on a group level he is also responsible for Marketing and Sales.

LION E-Mobility AG Advisory Board

Craig Davis, MBA

In the last 3 years Craig Davis was Sales & Marketing Director at Tesla Motors (NASDAQ: TSLA) where he drove strong growth of the company. He built up a complete marketing and sales team and trained them to become experts in the e-mobility sector. Craig Davis holds an International Master of Business Administration (MBA) and has more than 20 years experience in marketing & sales, business development and international project management. His network stretches from Singapore to Europe to Los Angeles. Mr. Davis is an energetic brand builder and a successful marketing professional. He has excellent references in the development of dynamic and global brands such as in high tech start-ups and in the premium automotive sector. From 2001 to 2008 he worked in brand management of the MINI at BMW AG in Munich where he successfully managed projects to establish the MINI brand on the world market. Previously, he spent 3 years in brand management of The Coca-Cola Company in Vienna. His strengths are particularly in business development and strategic partnerships with innovative and unique marketing platforms and business as well as consumer marketing campaigns.

LION E-Mobility AG Advisory Board

James Wilde, MBA

James Wilde also has an international MBA since 1996 and has had Chief Operating Officer (COO) and Chief Financial Officer (CFO) roles in start-ups and large telecommunications and technology companies over the last years. His references include leading companies such as Telefonica, British Telecom and MTS in Russia as well as Creditanstalt and The Coca-Cola Company in Austria. His strong international experience with projects in six countries on four continents enables quick and effective worldwide project management for LION E-Mobility.

Dipl.-Ing. Daniel Quinger

Currently Daniel Quinger is Managing Director of TÜV SÜD Battery Testing GmbH. He is one of the founders and was CEO of LION Smart GmbH until the end of 2010. Daniel has extensive experience in the automotive industry, testing of lithium-ion batteries, strategic innovation management and product development. Prior to incorporating LION Smart, Daniel worked in different positions for 3M, BMW, EVA Fahrzeugtechnik and ENAX Batteries in Europe, North America and Japan.

LION Smart GmbH Management

Dipl.-Kfm. Winfried Mundl

Winfried Mundl studied technology oriented business administration at the Technical University of Munich with a specialization in capital markets as well as Chemistry. Winfried has considerable experience in accounting, corporate finance, project management and consulting. Prior to incorporating LION Smart GmbH and LION E-Mobility AG Winfried worked in several business consultancies and investment banks.

Dipl.-Betriebswirt Harald Seemann

Harald Seemann studied European Business Studies in Regensburg, Germany and La Rochelle, France. Harald has extensive international experience in corporate development, investor relations, global sales and marketing. After working with Deutsche Bank in London and Societe Generale in Paris he founded LION Smart GmbH and LION E-Mobility AG.

LION Smart GmbH Advisory Board

Martin Ertl, MBA

Currently, Martin Ertl is Chief Innovation Officer at Bombardier Transportation based in Berlin, Germany. After finalizing his studies in industrial engineering he joined AUDI AG in 1996 and worked in several managerial and non-managerial functions covering HR, manufacturing and design until 2004. In parallel he successfully completed an Executive MBA in 1999/2000 at the Universities of Augsburg and Pittsburgh. In January 2005 he joined BMW AG as Head of Innovation Impulses. His responsibilities covered the scouting and monitoring of promising trends, innovations and technologies outside the automotive business by using classical methods as well as external networks and open innovation methods. Since July 2008 he is with Bombardier Transportation as Chief Innovation Officer. His responsibility is to set up and implement an innovation strategy, a structured and holistic innovation management, the governance of the process along the value chain and support/training of the divisions and business unit in generating innovations.

LION Smart GmbH Advisory Board

Prof. Dr. habil. Martin Leucker

Martin Leucker is currently a professor at Technical University of Munich in the field of computer science. He studied mathematics and computer science at RWTH Aachen University, Germany, graduating with a diploma in mathematics in 1996 and a doctoral degree in computer science in 2002. Afterwards, he worked as a PostDoc at the University of Pennsylvania, USA, and at Uppsala University, Sweden. He pursued his Habilitation at Technical University of Munich in 2007.

Martin Leucker is the author of more than 70 reviewed conference and journal papers ranging over formal methods, modeling and analysis techniques, software engineering, and theoretical computer science. He is regularly visiting research groups at NASA, Stanford University and ENS Cachan/Paris. He is frequently a program committee member of top ranked conferences.

Together with Martin Sachenbacher, he established the field of energy informatics at Technical University of Munich, which focuses on the application of methods developed in computer science to model and reason about energy aspects of systems, especially in the area of electric vehicles. Both are currently involved in the project eE-Tour Allgäu, a larger German project to optimize the usage of electric vehicles in rural areas.

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LION Smart GmbH Advisory Board

Dr. Martin Sachenbacher

Martin Sachenbacher heads the Emmy Noether junior research group "Constraint-based Models and Algorithms for Self-Diagnosis and Planning" at the Department of Computer Science at Technical University of Munich. He graduated from Technical University of Munich with a diploma in computer science in 1996, and a doctoral degree in computer science in 2001. From 1996 to 1999, he worked as a postgraduate at Robert Bosch GmbH, Stuttgart on a European project on vehicle model-based diagnosis. From 2002 to 2005, he was a PostDoc at MIT's Computer Science and Artificial Intelligence Laboratory, USA. The focus of his research are intelligent technical systems that can diagnose, plan and optimize their behavior based on probabilistic models and combinatorial search algorithms. Together with Prof. Dr. Martin Leucker, he is involved in the German project eE-Tour Allgäu, which aims to optimize the usage of electric vehicles in rural areas.



Joint Venture

TÜV SÜD Battery Testing
GmbH



TÜV SÜD Battery Testing GmbH



Battery Testing GmbH



- **Munich/Germany based battery testing service provider offering performance, environmental and abuse testing of cells, modules and battery systems with a focus on the European testing business within TÜV SÜD Group.**
- **New Battery Test Center in Garching/Munich with over 1400 m², an investment of several Million Euros in Battery Testing Equipment and Infrastructure, officially opened since October 17, 2011.**
- **Founded in November 2010, managed by Dipl.-Ing. Daniel Quinger (Founder and Managing Director of LION Smart GmbH until the end of 2010) and Dipl.-Wi.-Ing. Stefan Rentsch (Head of e-mobility at TÜV SÜD AG until the end of 2010).**
- **Strong partnerships with universities, research institutes and innovative companies.**
- **Strong growth in revenues, positive future outlook.**
- **TÜV SÜD AG is committed to the goal to become market leader for batter testing in Germany.**

Reaching Excellence



Chair for electric energy storage devices
(Prof. Dr. Jossen)



Prof. Dr. Andreas Jossen
Lehrstuhl für Elektrische Energiespeichertechnik,
TU München
Professorship for electric energy saving technique,
TU Munich



TÜV SÜD Battery Testing GmbH



Chair for automotive engineering
(Prof. Dr. Lienkamp)



Joint Venture Management Overview

- **Strategic goal to become German market leader in battery testing, further expansion in Europe and globally (Toronto, North America and Singapore, Asia).**
- **Huge synergies because LION Smart is expert in battery testing and TÜV SÜD AG long-term leader in industrial certification.**
- **Abuse testing according to United Nations guidelines 38.3 and EU regulations.**
- **Market know-how and customer relationships from LION Smart are combined with professional reputation of TÜV SÜD AG.**
- **Strong partnership: 2010 was another record year for TÜV SÜD AG with 1.55 billion Euros in revenues.**

Joint Venture Clients

Large European
OEMs

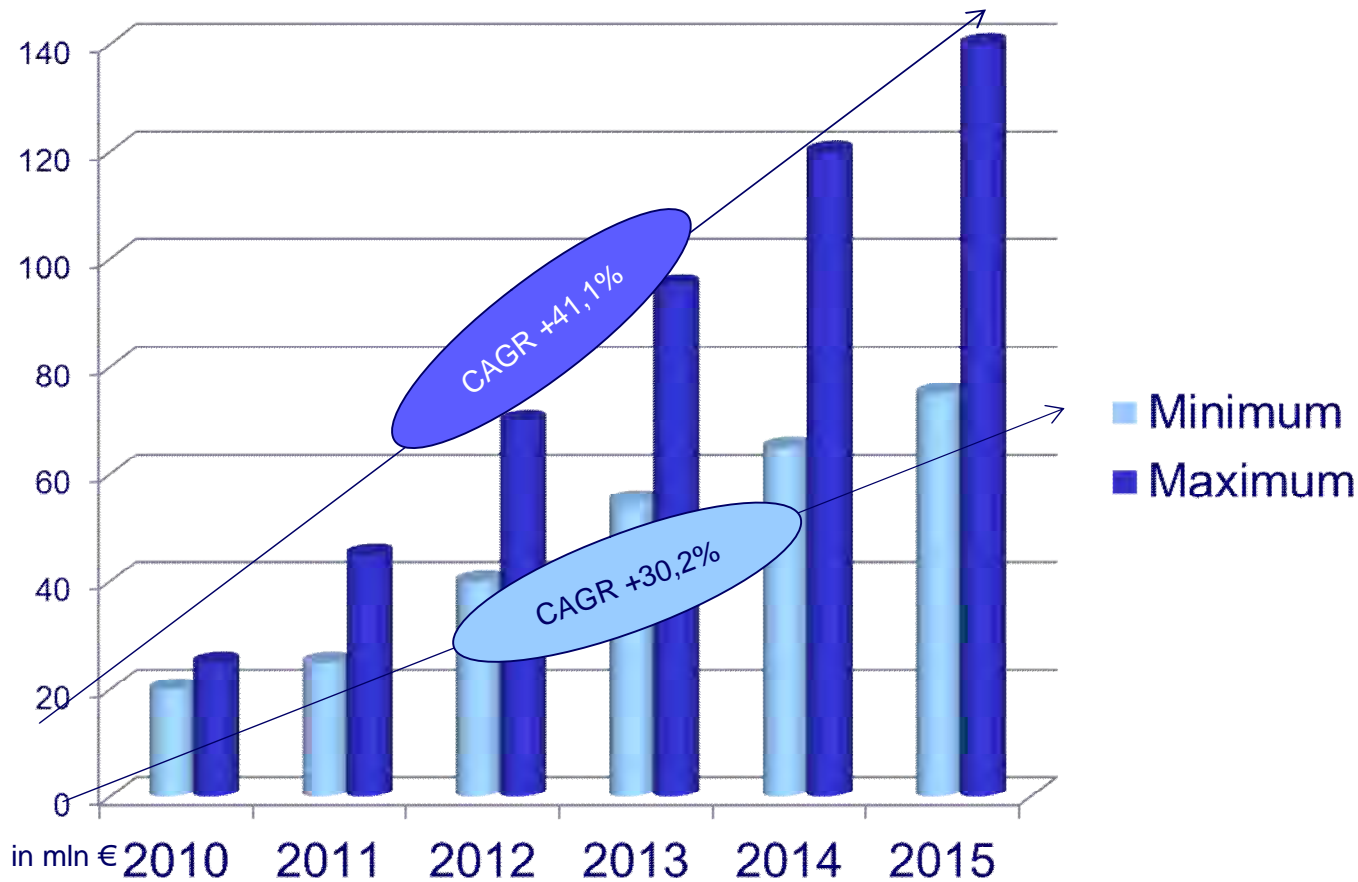
Tier 1 and Tier 2
Automotive
Suppliers

Research
Institutes

Battery
Manufacturers

Manufacturers
of Stationary
Systems

Expectations for Battery Testing Revenue Worldwide



Source: McKinsey & Company

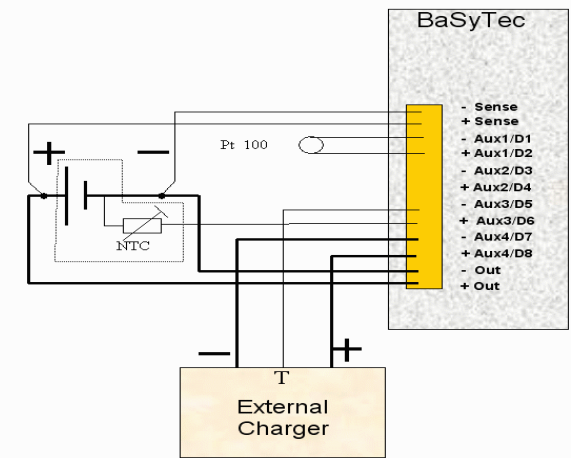
Test Lab for Electric Storage Devices

- **Cyclization testing of single cells and multi-cell systems**
- **Testing according to specifications of FreedomCAR, the United States Advanced Battery Consortium (USABC)**
- **Storage testing and life cycle testing at temperatures from - 40° to 180° C**
- **Implementation of individually designed cell/battery tests**
- **Battery tests in connection with battery management systems**



Possible measurements

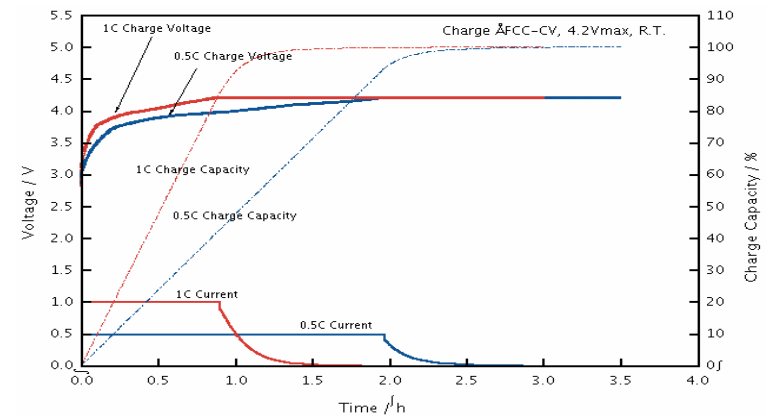
- **Measuring of cell parameters**
 - Internal resistance
 - Capacity
 - Open circuit voltage
 - Hysteresis voltage
 - Performance
- **Static / dynamic measurements**
- **Drivecycles**
- **Life cycle testing (Aging)**
- **Additional measurements according to manufacturer's guidelines**



Batterytestsoftware - [user: basytec] - [Messdaten]

Auswahl des Tests: Batterie: Soft_LiNCd Zelle 1 Kan: Kan 00 (SV/3A) Y Feldname: [UV]
 Testname: Memos-Elekt Start: 08.02.2001 10:55:39 X Feldname: [Timeh]
 Datenzeile: Schritt Testplan: Memo_Test_1CA_20.p Testplan: 10.02.2001 00:32:10
 Export: Datenauswahl: Alle Ohne Schritte Nur Schritte State: 0
 Zelle: [] und Ziele [] Zyklus [] und Zyklen []
 Plan [] SQL [] Update []

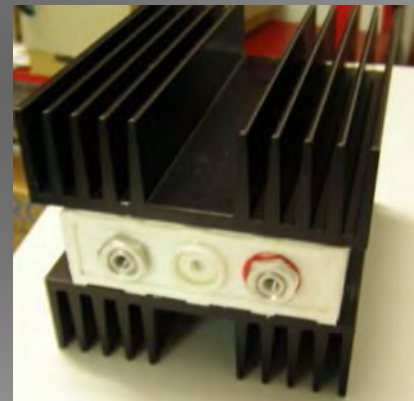
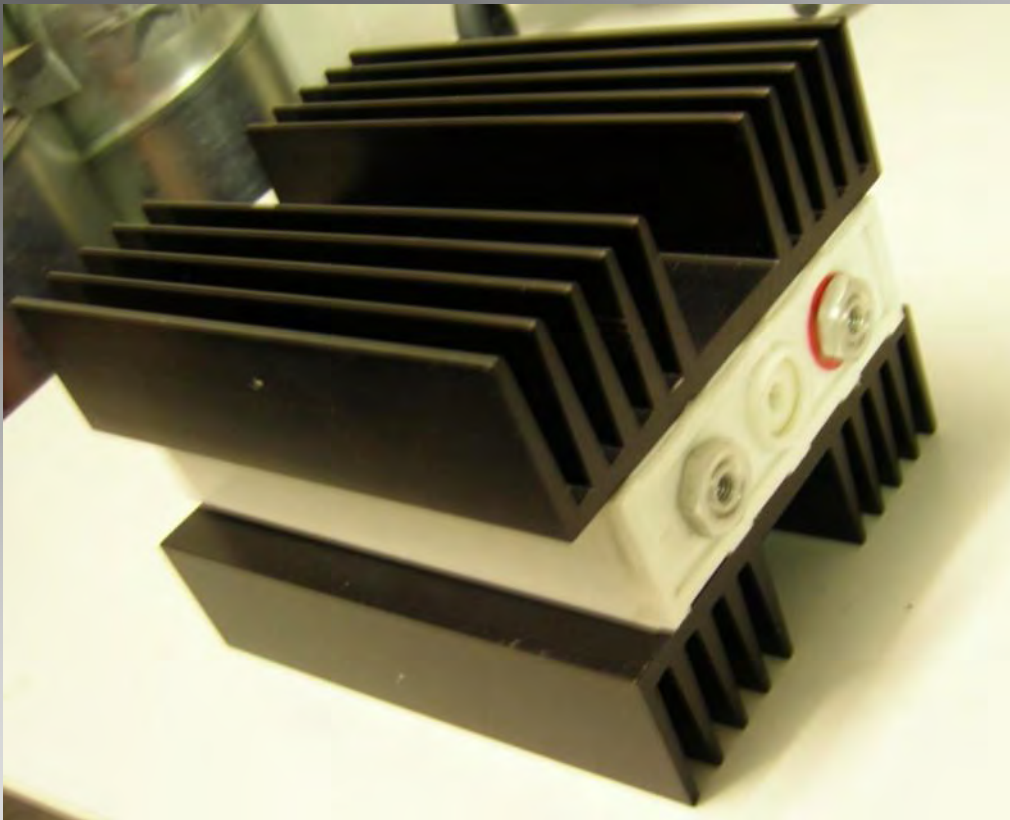
DataSet	Timeh	t-Step(h)	t-Set(h)	UV	I[A]	AH(AH)	Ah-Charge	Ah-Discharge	Ah-Step	Ah-Set	Ah-Ch-Set	Ah-Ds-Set
0	0.00	0.000	0.001	1.3810	7.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	0.002	0.002	0.002	1.3877	7.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001
2	0.003	0.003	0.003	1.3939	7.002	0.002	0.002	0.000	0.002	0.002	0.002	0.002
3	0.004	0.004	0.004	1.3991	7.001	0.003	0.003	0.000	0.003	0.003	0.003	0.003
4	0.005	0.005	0.005	1.4044	7.001	0.003	0.003	0.000	0.003	0.003	0.003	0.003
5	0.007	0.007	0.007	1.4096	7.001	0.005	0.005	0.000	0.005	0.005	0.005	0.005
6	0.031	0.031	0.031	1.4148	7.000	0.021	0.021	0.000	0.021	0.021	0.021	0.021
7	0.051	0.051	0.051	1.4201	7.000	0.036	0.036	0.000	0.036	0.036	0.036	0.036
8	0.071	0.070	0.071	1.4253	7.000	0.049	0.049	0.000	0.049	0.049	0.049	0.049
9	0.084	0.084	0.084	1.4287	7.000	0.059	0.059	0.000	0.059	0.059	0.059	0.059



Testing of flat cells (pouch/coffeebag)



Testing of prismatic cells

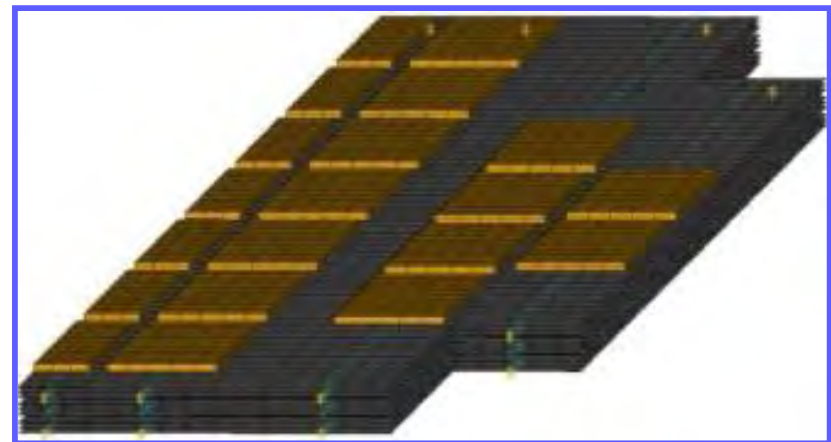
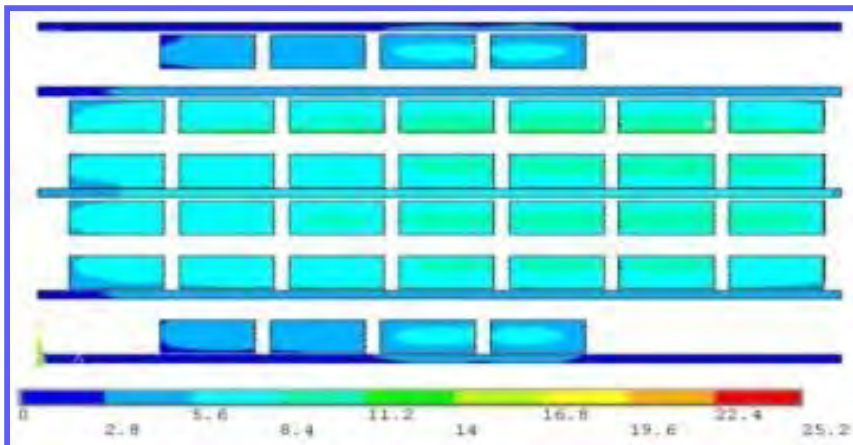
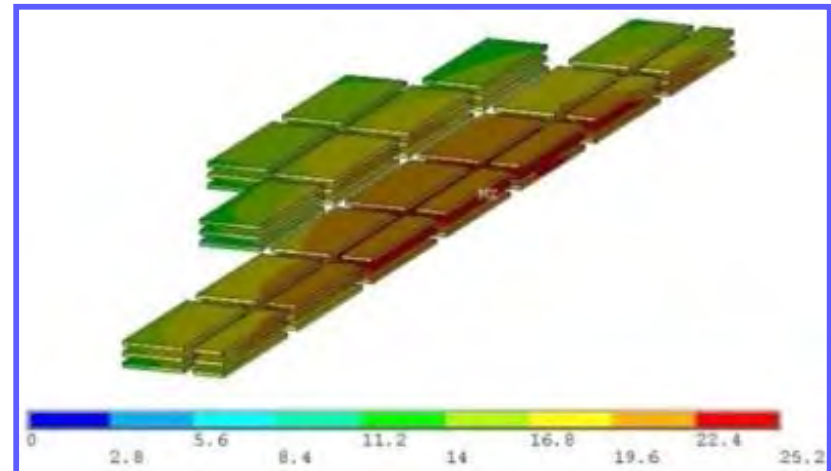




LION Smart GmbH

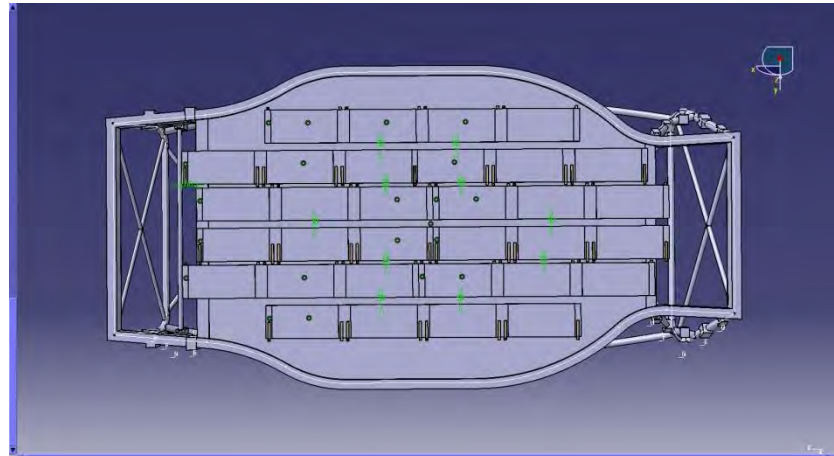
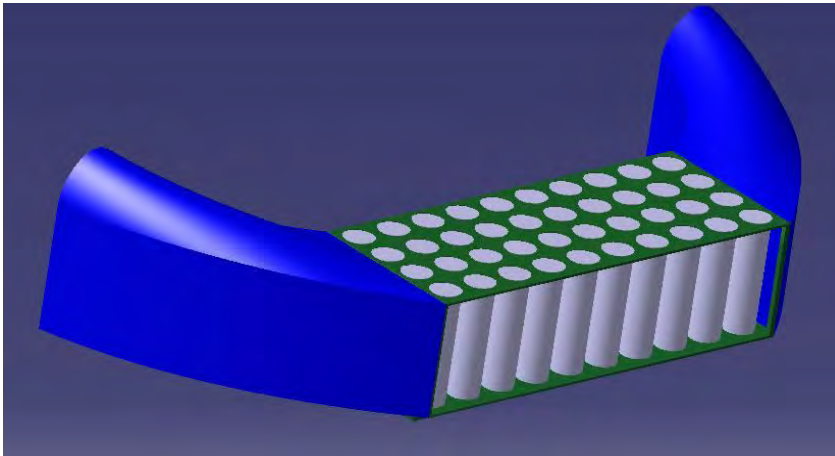
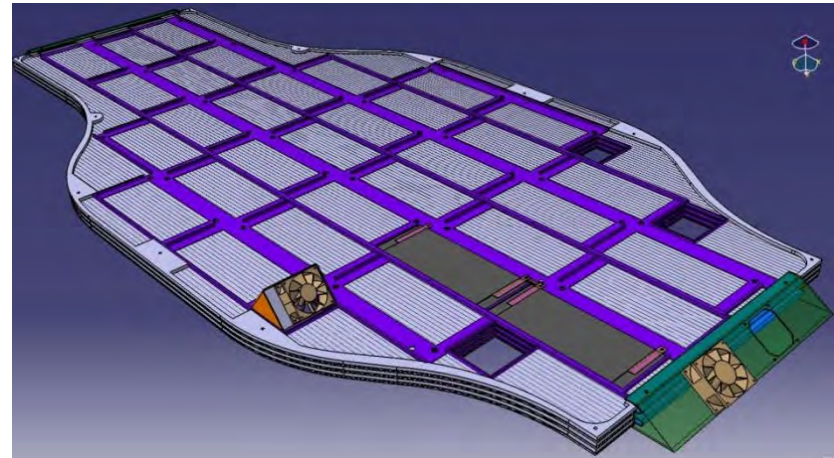
Simulation Services

- Development of battery models
- Simulation of single cells up to entire battery packs
- Evaluation and optimization of battery packs
- Interpretation and adjustment of temperature management systems



Design Services

- Design and construction of battery packs
- Assembly of prototypes
- Creation and optimization of battery management systems
- Thermal management of lithium-ion batteries



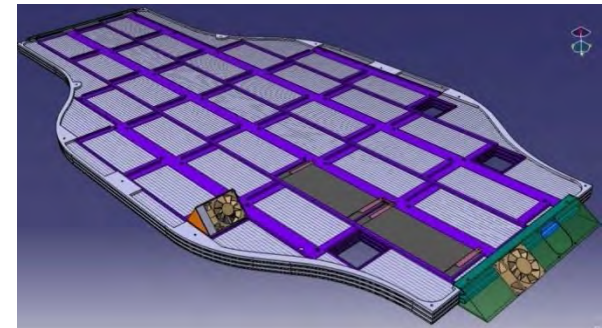
Projects

- ▶ **Battery pack for E-Trial
(Tier 1 motocross supplier)**



Projects

► Battery pack for the EF1



► Next project has already started!

Consulting in Lithium-Ion Technology

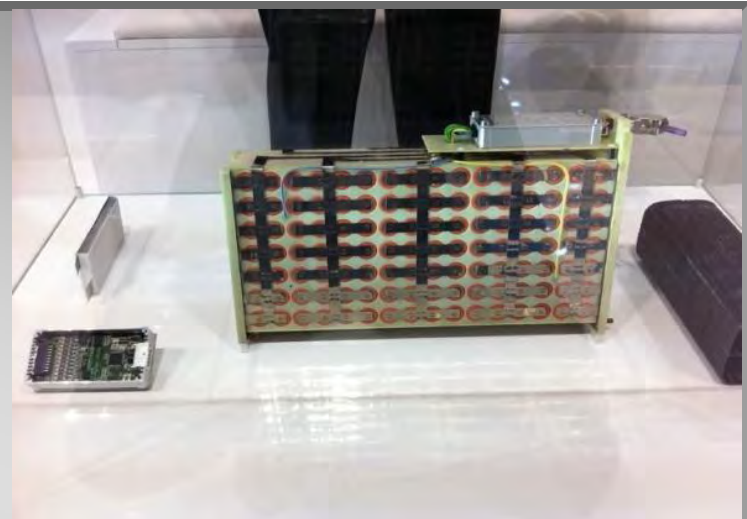
- **Workshops, training, seminars.**
- **Professional training in lithium-ion technology.**
- **Trend and market research in the field of new drive propulsion systems and electric / lithium-ion storage technology.**
- **Analysis of systems and support during selection of suitable electric energy storage systems; selection of manufacturers in Asia.**
- **Analysis and potential of hybrids, plug in-hybrids and battery electric vehicles.**

Research & Development

- **Development of an enhanced and adaptive battery model.**
- **Development of an innovative battery pack.**
- **Development of a battery management software.**
- **Use of computer aided design (all current software products).**
- **Conceptual design and construction in Solidworks 2010.**
- **Kinematics simulations and renderings of products with construction data.**

Mission Statement Li-BMS

- Develop and build a „safe system“.
- Open source platform.
- Modular design.
- Affordable platform.
- Target: Automotive and large battery systems.
- Short term targets: Students, scientists, research and development projects.
- Joint commercialization.



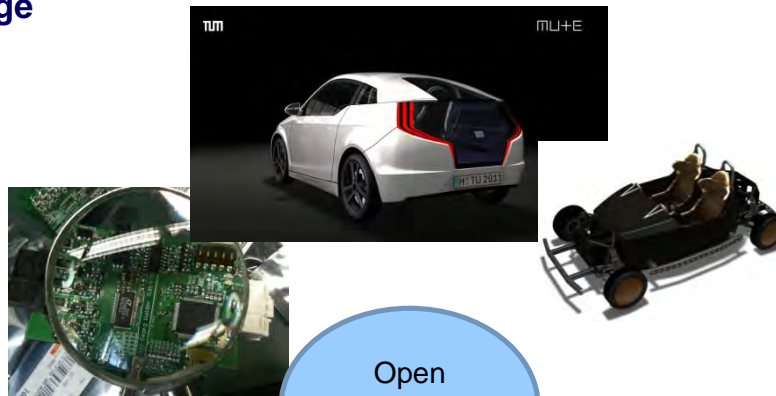
Network of Li-BMS Project Partners



Chair for electric storage technologies
(Prof. Dr. Jossen)



Chair of automotive engineering
(Prof. Dr. Lienkamp)



Open Source BMS



LION Smart's Li-BMS development program was funded with ~100.000 Euros from the ZIM program of the German Federal Ministry of Economics and Technology. An application for ZIM2 is planned to receive further funds.

Further Li-BMS Development Financing

- ▶ Within this consortium LION Smart GmbH will develop an innovative, server based Battery Management System and a new cooling concept for electric vehicles.



LION Smart's Li-BMS development will soon get an additional ~150.000 Euros of subsidies from the VisioM program of the German Ministry of Education and Research. (Application is pending)

Li-BMS Parameters

- Stand-alone architecture
- 1 mV precision in cell-voltage-measurement
- 12 cells for each BMS-module
- >2,5 kV-isolated cell-measurement-sector
- 32-bit processor for SOC-calculation
- 2x CAN-interfaces
- 10/100 Ethernet interface
- USB-Data-logging
- Different kinds of topologies:
 - central: for small stacks (12 cells)
 - modular: for medium stacks (12-48 cells)
 - Master-Slave: for large stacks (48++ cells)



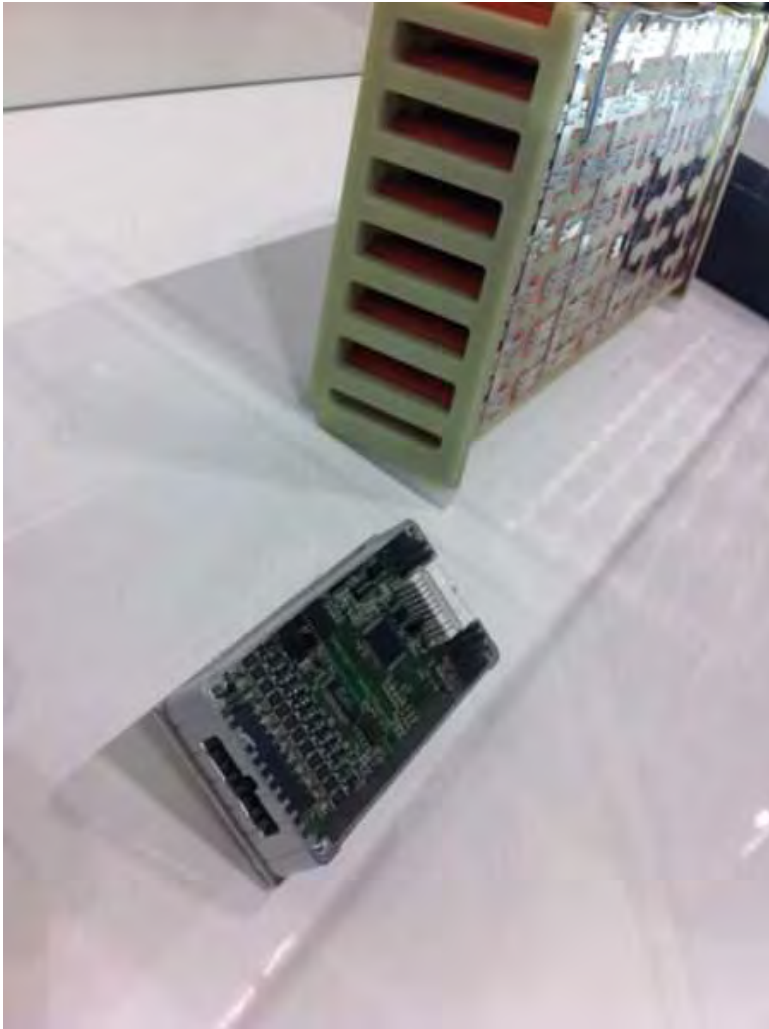
- Open-Source- Software
- Good cost-effectiveness
- Module size
only LxBxH (mm) =90x50x10
- Supply: 5V max. 100 mA
- BMS-Master-function ability with an add-on masterboard
- High performance passive cell-balancing with 300mA balancing-current

- Sophisticated Secure-concept
- Redundant cell-voltage-measurement
- Redundant communication structure
- Pilot-line trigger unit
- isolated I²C Temperature-BUS
- evaluation of two analogue temperature sensors

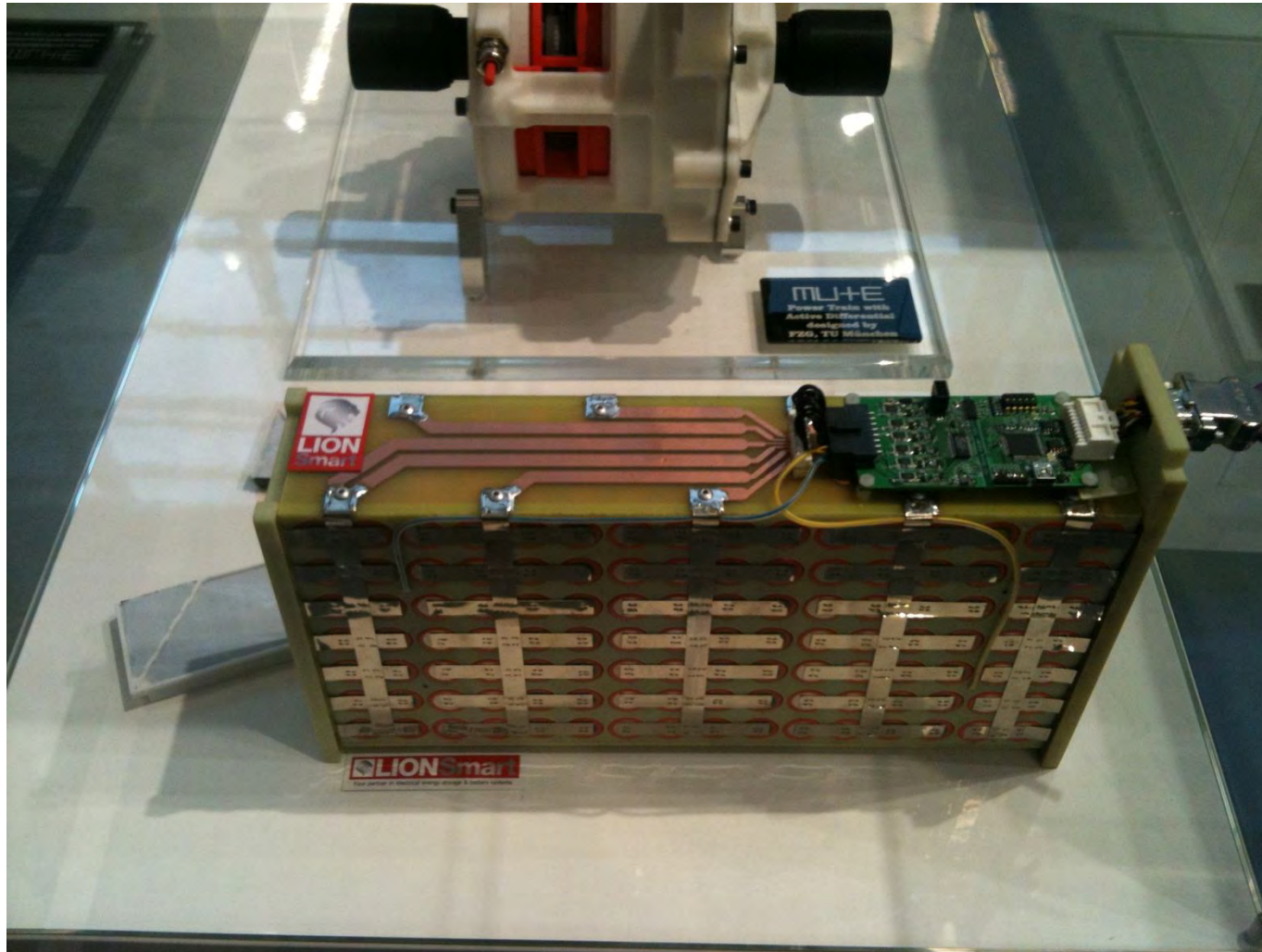
Li-BMS Presentation at the IAA



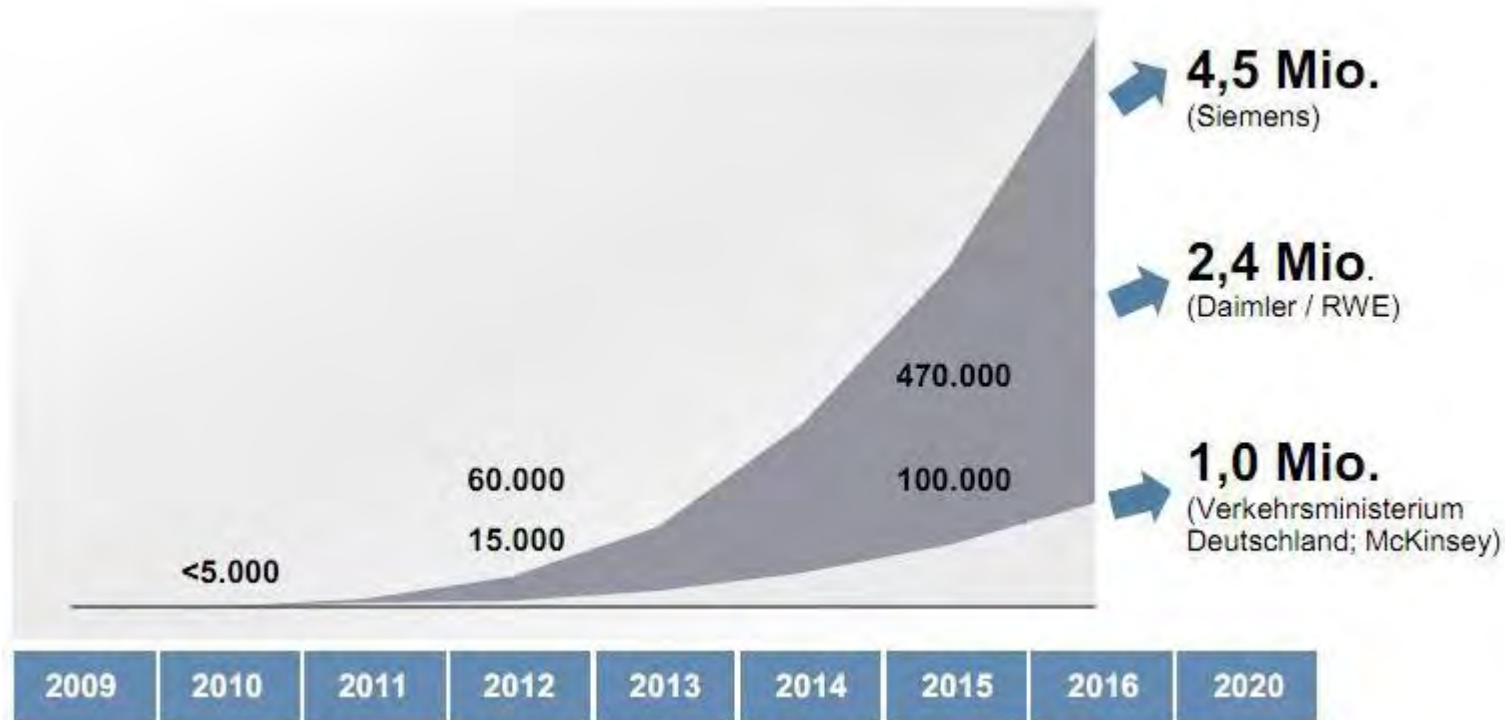
Li-BMS Presentation at the IAA



Li-BMS Presentation at the eCarTec



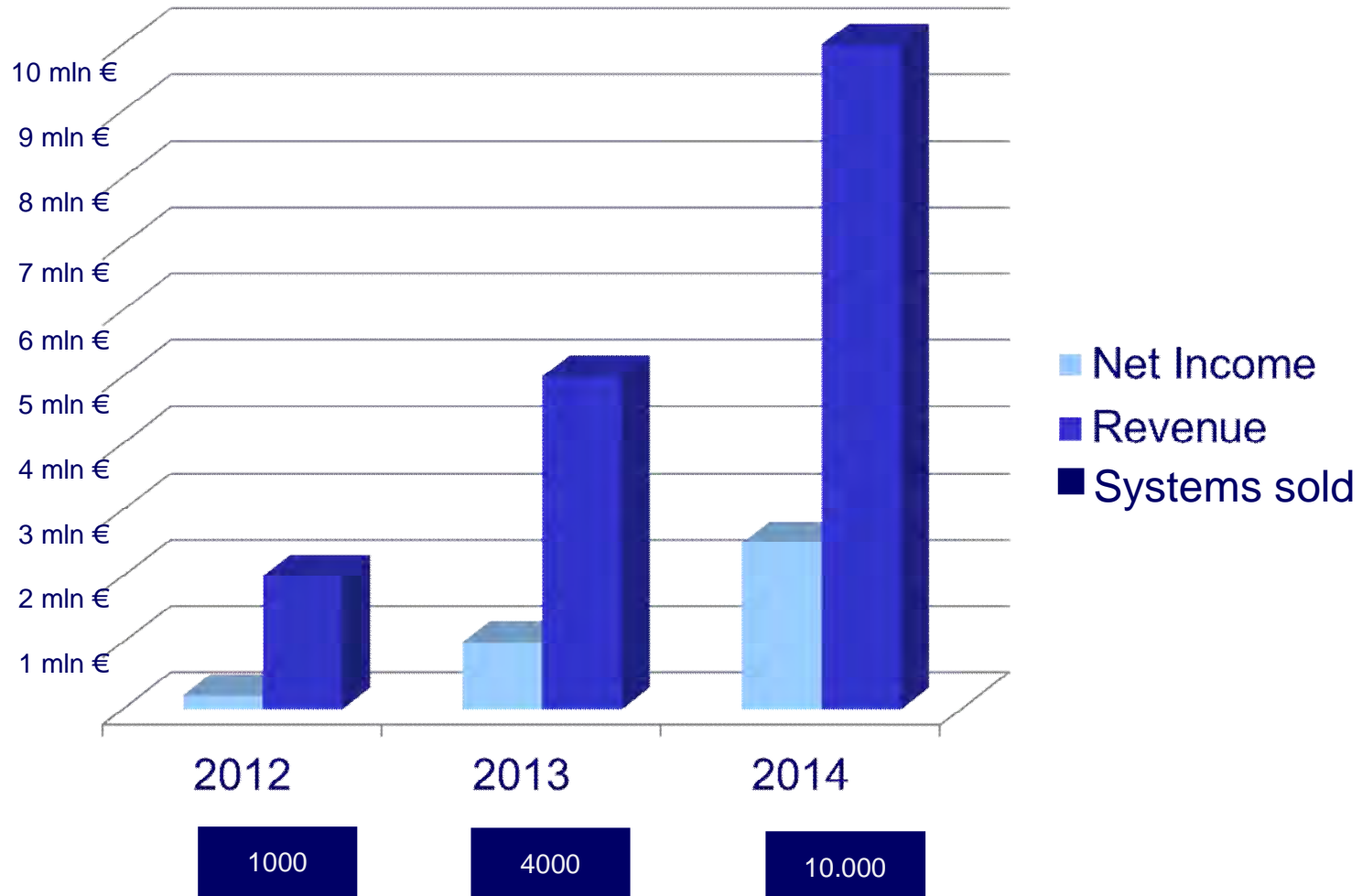
Electric Vehicles on German roads: Different Market Expectations



Source: RWE AG

A BMS is essential for every electric vehicle. The BMS market will not only multiply but skyrocket.

Expected Revenue and Net Income from Li-BMS sales

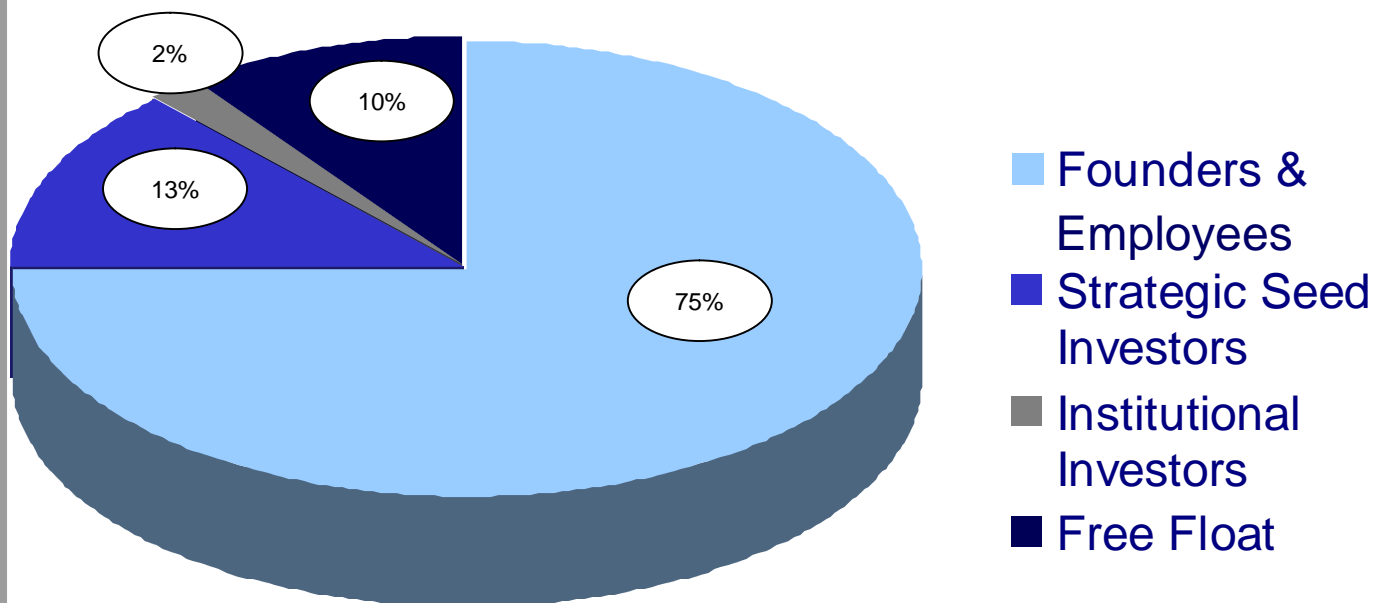


Why Zug in Switzerland?

- **Corporate tax rate of < 8% possible.**
- **High reputation of Switzerland among automotive clients.**
- **German is the official language in Zug.**
- **The legal system is quite similar to Germany.**
- **Short distance (3h by car) to our core assets in Germany.**
- **International expansion plans are easier to implement.**

LION E-Mobility AG Shareholder Structure

- **5 Million Shares Issued & Outstanding**
- **Tightly held, low dilution**
- **Listed on Frankfurt, Berlin and Stuttgart Stock Exchanges**
- **WKN: A1JG3H, Ticker: LMI**



Contact Information

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6300 Zug
Switzerland**

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