Global Opportunities for SMEs in Electric Mobility

Beate Müller
VDI/VDE Innovation + Technik GmbH
Berlin

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Global EV Market

Situation

- **USA**
  - Market Volume: 285,000
  - Potential: 3 Mio

- **Brazil**
  - Potential: 500

- **China**
  - Potential: 75,000
  - Potential: 200,000

- **Korea**
  - Potential: 200,000

- **Japan**
  - Potential: 100,000

- **India**
  - Potential: 2000

- **Potential**
  - 1 Mio
  - 200,000

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- **Market Volume (2015)**
- **Market Potential** (by governmental targets for 2020)
- **Entry Barriers (2014)** (low – medium – high)
Analysis of Global EV Supply Chains

Investigation of

- Situation and framework conditions:
  - Government policies and plans, incentives, funding programmes and other initiatives
  - Market situation and specifics on customers
  - Distribution of infrastructure and initiatives to further implementation
  - Competing transport means and fuels (car sharing, public transport, fuel cell and gas vehicles)

- Trends
- Mapping of supply chains, analysis of dynamics within Porter’s 5 Forces and SWOT
- Attractiveness of supply chain, qualifying and competing factors, Entry points for European SMEs
Electric Mobility in Japan
Trends – Smart Community

- Use of EV batteries as emergency power supply
- Energy storage of locally produced electricity from renewable sources
- Supply and demand energy management by controlled charging and discharging of EV batteries in the smart grid
Electric Mobility in Japan
Trends – Intelligent Mobility

Ha:mo Concept (Source: Toyota 2013)

- Network solutions combining private car and public transportation efficiently and using micro EVs for last mile
- Autonomous, mobility supporting robots
- Synergies of electrification, connectivity, and automation also enabled by well-developed ITS infrastructure
Electric Mobility in Japan

Market Attractivity
• Japan is pioneer: EV market highly developed and innovative
• Highly efficient industry, disciplined employees, high quality standards, advanced infrastructure
• Re-organisation of traditional *keiretsu* system provides opportunities for new entrants in Japanese supplier networks in fields where know-how and expertise are complementary

Barriers
• *keiretsu* are rather closed structure and hard to access from outside
• Japanese companies expect high quality and extensive product services (product-life-time service including re-engineering, after sales service and high-quality packaging) that often requires a representation office close to customers
• Cultural and language barriers
• Can be overcome easier today by entering the Japanese supply chain through cooperations in India, China or Europe
Electric Mobility in Korea
Trends – Micro EVs and electric fleets for big cities

Armadillo foldable car (Source: KAIST 2013)

- All-electric car with two seats and four in-wheel motors, weight 450kg, range 100km
- Takes only 1/3 of a regular parking spot when folded
Electric Mobility in Korea
Trends – Inductive en route charging

Online Electric Vehicle (OLEV) (Source: KAIST 2013)

- Wireless electro-magnetic transmission to power electric vehicles (cars, buses, vans, etc.) in motion
- First OLEV in Seoul Zoo, 2009
- World’s first commercial application of OLEV for 24km bus line in the City of Gumi since 2013
- Further applications planned in other cities, also international
Electric Mobility in Korea

Market Attractivity
- Korea is an attractive manufacturing country: high-quality output, low production costs
- Good business opportunities in engine- and infrastructure-related businesses, charging technologies and standardization, new EV business models
- Government promotes SME growth and Korean-European technological cooperation

Barriers
- Currently low demand of EVs, users are still hesitant to purchase EVs
- SMEs have to overcome barriers to come into existing chaebols eg. by partnerships with suppliers of the chaebol or by showing prestigious references
- Highly competitive market
**Electric Mobility in US**

**Trends – Tesla Motor Story**

*Tesla Model S suppliers and sketch of Tesla Battery Gigafactory in Nevada (Source: Tesla 2014)*

- Tesla Model S is the first electric sedan with range up to 300km, using 1,000kg Li-ion consumer cell batteries.
- In June 2014, Tesla Motors announced its intention to share all patents to spur electric car development.
- Mass manufacturing of batteries in gigafactory to equip 500,000 Tesla cars: construction start in 2014.
Electric Mobility in USA
Trends – On-route charging for EVs

I-710 Corridor Project, Long Beach Freeway, California

- Zero emission trucks using catenary pantograph system developed by Siemens.
- Improvement of air quality and public health, safety, and the design of the highway with the horizon year 2035.
Electric Mobility in USA

Market Attractivity

- Excellent framework conditions: political and economical stability, low entrance barriers, consumers are open towards e-mobility
- New market opportunities in different sectors: vehicles, batteries, charging infrastructure, mobility services, etc.
- Strong government support for vehicle automation and technologies promoting synergies of automation and electrification

Barriers

- High competition in automotive supply chain
- Domestic suppliers benefit from their connections and business network and economies of scale
- Complex legal framework and region-dependent differences can cause difficulties
Electric Mobility in China
Trends – *Electric buses & standardization of charging infrastructure*

Pioneer in manufacturing and export of electric buses.

Standardization issued by central government in the future: elimination of numerous local standards for charging and billing (isolated applications)
## Electric Mobility in China

### Market Attractivity
- Steadily growing Chinese car market has huge potential: High sales rates and growing potential for EVs
- China lags behind in key technologies: Business opportunities for SMEs especially in design and development of control units and electronics, “intranet of cars”
- Cost advantages of up to 25% compared to other countries, due to good access to natural resources and lower labor costs.

### Barriers
- Chinese companies favor Joint Ventures with bigger foreign companies: more difficult for SMEs, easier access for big multi-national players
- Government seeks to establish Chinese brands and a strong NEV market with domestic manufacturers
- Weak IP-protection: risk of losing technological know-how to Chinese partners
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Information on country reports
Gereon Meyer gereon.meyer@vdivde-it.de
Frauke Bierau frauke.bierau@vdivde-it.de
Beate Müller beate.mueller@vdivde-it.de

Coordinators
Prof. Thierry Coosemans Thierry.Coosemans@vub.ac.be
Dr. Ing. Arrate Alonso Gómez Arrate.Alonso.Gomez@vub.ac.be