Automotive Training Electromobility China (ATEC)
A joint project by: TUV Rheinland, Lucas Nuelle & Fraunhofer IFAM
Sponsored by the German Federal Ministry of Education and Research
Project background

- We are observing a rapid development of new energy vehicles in the automotive market. In the process of creating and developing this new technology, all kind of new training requirements are arising in regard to the technology and the safety aspects of these vehicles.

- China is participating in this development in the first line, so the training requirements to improve individual professional skills and competence are growing day by day.

- Against this background and supported by a special funding from the German Ministry of Education and Research, the companies TUV Rheinland, Lucas Nuelle and Fraunhofer IFAM have set up a joint project to develop and adapt relevant E-Mobility trainings to the Chinese market.

- Based on advanced training experience and technical resources from Germany, it is the aim to adjust the trainings according to local needs in China, develop new energy technology and safety training modules suiting to the Chinese conditions and to build a local professional training team able to deliver these programs in local language.
TUV Rheinland Training & Consulting

- Project background
- Project team
- Project implementation
Project goal and team members

- Improve training skills
- Improve people’s safety awareness
- Develop safety working instruction
- Improve training level in regard to new EV’s
- Master international EV technology
- Promote sustainable development of new energy vehicles

Combination of theory and practice

Training hardware and equipment

Curriculum development and professional training

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Team members

TÜV Rheinland

- Responsible for overall project management
- Providing training facilities for the new programs
- Identification and qualification of local trainers as multipliers
- Advanced practical equipment
- Updating training curriculum according to local markets
LN is a developer and manufacturer of sophisticated training and education equipment.

For the project, LN is providing its E-vehicle training hardware, including multimedia courseware.
Team member

IFAM (Fraunhofer IFAM)

Fraunhofer is one of Europe’s largest application-oriented research organizations.

- Making training plan according to the new energy vehicle market in China
- Developing local curriculum combined with German advanced technical resources
- German experienced trainer doing pilot TTT programs

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Resource integration

- Market requirements, training participation, feedback after training
- TUV manage training activity, continually update the training.
- Curriculum
- Trainer
- Practical equipment
- Venues
- Participant
- Local market
- Training requirement
- German technology
- Market requirement
- Management
- Resource integration

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- Project background
- Project team
- Project implementation
Project framework

Sino-German E-vehicle training project

M1
- Chinese market analysis
- Confirm training needs

M2
- Confirm training outline

M3
- Develop training material
- Manufacture hardware for training
- Build infrastructure

M4
- Run pilot TTT
- Provide marketable trainings in China

Project start: 2014.08.01
Project end: 2016.07.31

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Project step

- Analyse Chinese E-vehicle market, training needs on E-vehicle, national policies, laws and regulations.
- Visit domestic OEM’s, spare part suppliers, government agencies and other potential customers, determine training needs.
**Project step**

- Make draft training outline based on the market analysis
- Finalize training outline, defining training plan based on the discussion between the domestic and international technical teams.

**Training outline (according to German I8686E standard):**

- Basic electric knowledge
- Electrical hazards and first aid on high voltage
- Measures for protection against electric shock and fault arcs
- Organization of safety and health for electrical work
- Five safety rules
- Specialist and management responsibility
- Measuring equipment on high voltage and wire testing
- Use of high voltage systems in vehicles
- Linking theory and practice

**Target group:**
- technicians on E-vehicles
- R&D engineers on E-vehicles
- testing engineers on E-vehicles
- technicians for maintenance and repair of E-vehicles

*Qualification stages for work to be performed prior to the start of production.*
### Training level

**Level 1:** non-electrical work
- Performance of all mechanical tasks and the associated equipment
- The level is mainly for personnel with no access to high voltage.
- Testing driver
- Worker for welding, sheet-metal and painting
- Non-electrical worker for panel work, oil and wheel changes and so on.

**Level 2:** electrical work in non-live state
- Employees who work on electrical systems must work in non-live state.
- The level is mainly for personnel with access to high voltage systems
- R&D engineer for E-vehicle
- Spare parts testing engineer
- Technicians and engineers working on high voltage system

**Level 3:** live work on the high voltage system
- Participants must pass the level 2 training first
- Troubleshooting on E-vehicle
- Working on power battery
- R&D and testing on high voltage systems

The training is divided into 3 levels according to the different duties and working conditions of trainees.
Project step

- Create and compile training material according to domestic E-vehicle market (for trainer)
- Develop training material (for trainees)
- Developing multimedia courseware and training equipment
Project step

- Do pilot TTT with support of German experienced trainers
- Combine theory with practice on vehicles, full participation of trainees
- Provide marketable E-vehicle trainings by local trainers in China
According to BGI/GUV-I8686E, electrical systems and equipment should generally be placed in the non-live state prior to and for the duration of work.

Even a minor mistake could result in high voltage injury!
E-vehicle - Lithium-ion battery
For further information please contact

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