



Announcement and Call for Contributions

Expert Workshop

**“LCA of Electric Vehicles – Current Status
and Future Perspectives”**



Time: November 11, 2015

(in connection to the A3PS Conference 2015 November 9 – 10, 2015)

Place: TechGate Vienna, Austria

Local organisers:

JOANNEUM RESEARCH, A3PS - Austrian Association for Advanced Propulsion Systems and Austrian Ministry for Transport, Innovation and Technology



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Aims of the workshop:

Electric vehicles (EVs) have the potential to substitute conventional vehicles and to contribute to the sustainable development of the transportation sector worldwide. There is an international consensus that the environmental assessment of electric vehicles can only be performed on a life cycle basis, including production, operation and end of life by using Life Cycle Assessment (LCA) methodology. For example, about 90% of the greenhouse gas (GHG) emissions of a vehicle running on renewable electricity from hydropower are associated with the production and end-of-life treatment of the vehicle, while only 10% are the result of the vehicle operation. If the electricity is coming from a coal power plant, the GHG emissions of the vehicle operation are most dominant (> 95%)

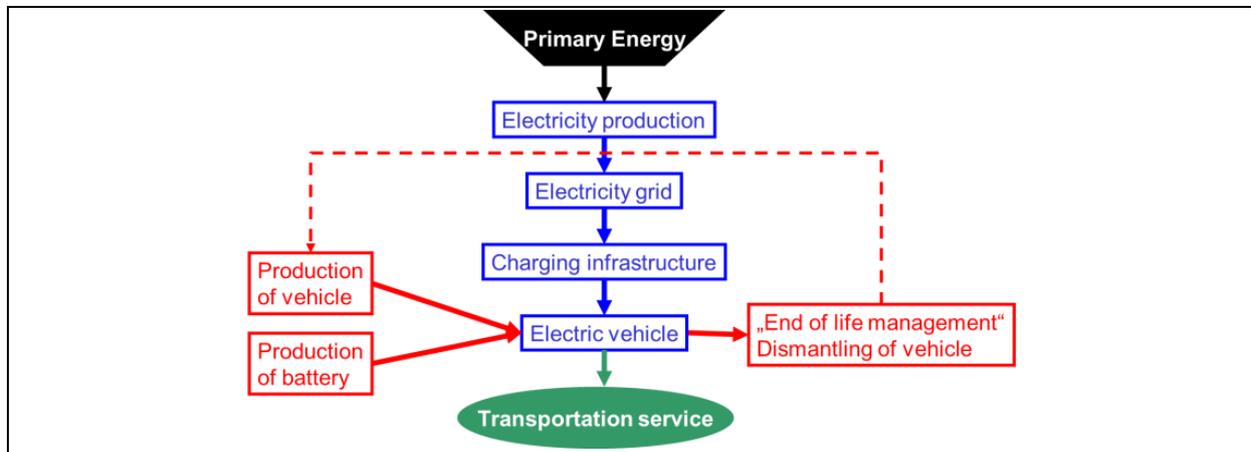


Figure 1: Key elements of the life cycle assessment of vehicles with an electric drive train

The Implementing Agreement on “Hybrid and Electric Vehicle (HEV)” of the International Energy Agency (IEA) is operating the Task 19 “Life Cycle Assessment of Electric Vehicles” to examine the environmental effects of vehicles with an electric drivetrain based on life cycle analyses. The Task 19 started in 2012 and will continue until the end of 2015. The main activities influencing the environmental impacts of electric vehicles on a life cycle basis are:

- 1) Production and life time of the battery,
- 2) Electricity consumption of the vehicle in the operation phase, incl. e.g. energy demand for heating,
- 3) Source of the electricity, only additional renewable electricity maximizes the environmental benefits and
- 4) End of life treatment of the vehicle and its battery.

The aim of the workshop is to present the current status and the future perspectives of Life Cycle Assessment of vehicles with an electric drivetrain. The main focus is on Battery Electric Vehicles (BEV) and Plug in Hybrid Electric Vehicles (PHEV). The results of the activities of Task 19 (2012 – 2015) will be presented and recent developments in LCA methodology development and its application to EVs. In a group of relevant stakeholder from

government, industry, research and NGOs the effects of LCA results on the future large scale market introduction of EVs will be discussed.

The main topics for the workshop are:

1. **Results of Task 19 presented by the 4 participating countries (A, G, CH, US):**
 - a. “Results of IEA HEV Task 19 activities 2012 – 2015”, Gerfried Jungmeier, Operating Agent, JOANNEUM RESEARCH, Austria
 - b. “Results of reviewing of 100 international LCA studies on BEV and PHEV”, N.N.
 - c. “Real world drive cycle of electric and conventional vehicles”, N.N.
 - d. “LCA of electricity generation and Integration of renewable electricity”
 - e. “LCA of battery production”, Jennifer Dunn, Vice Operating Agent ARGONNE, USA
 - f. “Critical Metals in the Automotive Industry”, N.N. EMPA, Switzerland
 - g. “Automotive Battery Recycling and Critical Material Demand”, Linda Gaines, ARGONNE, USA
 - h. “Scenarios for lightweight materials for EVs”, Simone Ehrenberger, DLR, Germany
2. **International Highlights on LCA of EVs - Presentations from “Call for contributions”**
 - a. Influence of social issues and user behaviour on LCA results
 - b. “...from LCA to LCSA – Life Cycle Sustainability Assessment.....”
 - c. Impacts of mining of mineral resources/metals (Co, Ni) e.g. human health effects
 - d. Resource efficiency of EVs e.g. criticality issues
 - e. Including grid impacts of EVs charging in LCA
 - f. Updating of databases for LCA of EVs
 - g. Effects of EVs on water use and land use
 - h. Effects of EVs to waste management
 - i. :
 - j.
3. **Stakeholder discussion:** “Is LCA killing the electric car?” or “How to communicate LCA results?” with EV stakeholders (government, automotive industry, NGO, e-mobility regions, electricity companies, LCA experts)

CALL FOR CONTRIBUTION:

If you want to contribute with a presentation and/or statement to these topics please send your possible title and an abstract (max. 600 words) until June 30, 2015 to gerfried.jungmeier@joanneum.at

Already accepted contributions

1. IREC- SUNBATT project: Second life EV batteries for sustainable batteries waste management, Gabriela Benveniste, IREC - Catalonia Institute for Energy Research, ES
2. LCA of recycling of automotive batteries, Begum Yazicioglu, Umicore Battery Recycling, Belgium

Registration and further Information

Details for registration will be provided later. There is no registration fee for this Workshop.

For further information please contact

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Operating Agent of IEA HEV Task 19 „LCA of EVs“

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Task 19 “Life Cycle Assessment of Electric Vehicles”

Electric vehicles have the potential to substitute for conventional vehicles to contribute to the sustainable development of the transportation sector worldwide, for example, in the reduction of greenhouse gas (GHG) and particle emissions. There is international consensus that the improvement of the sustainability of electric vehicles can only be analysed on the basis of **life cycle assessment (LCA)**, which includes the production, operation, and the end-of-life treatment of the vehicles and the fuel cycle. All environmental impacts must include the whole value chain and - if relevant - interactions from recycling in the dismantling phase to the production phase, if recycled material is used to produce new vehicles.

Based on the LCA activities in the 18 IEA HEV member countries, the **main goals** are:

- Providing policy and decision makers with facts for decisions on EV-related issues
- Improving end-of-life management by identifying and promoting the best available technologies and practices
- Improving the design of vehicle and battery systems for optimal recyclability and minimal resource consumption
- Establishing a research platform for life cycle assessment including end-of-life management for EVs to augment the benefits and competitiveness of vehicles with an electric drive train.

The **main topics** addressed in the four-year working period (2012 – 2015) are:

- 1) LCA methodology (Workshop 1 in Braunschweig/Germany 2012))
- 2) Frequently asked questions on the environmental issues of EVs
- 3) Overview of international LCA studies in a database
- 4) Parameters influencing the energy demand of EVs
- 5) LCA aspects of battery and vehicle production (Workshop 2 Argonne/USA 2013)
- 6) Vehicle end-of-life management, e.g., recycling, or the reuse of batteries in stationary applications (Workshop 3 Davos/Switzerland 2013)
- 7) LCA aspects of electricity production, distribution, and vehicle battery charging (Workshop 4: Barcelona/Spain 2014)
- 8) Summarizing the further R&D demand

The main focus of Task 19 is on **Battery Electric Vehicles (BEV)** and **Plug-in Hybrid Electric Vehicles (PHEV)** for passenger cars. The **key LCA issues** that apply to EVs were identified and applied in various case studies. The following seven key categories were identified, evaluated and applied in “best practice” applications:

- 1) General issues,
- 2) Life cycle modelling approach,
- 3) Vehicle cycle (production – use – end of life),
- 4) Electricity production,
- 5) Inventory analysis,
- 6) Impact assessment
- 7) Reference system.

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<http://www.ieahev.org/tasks/task-19-life-cycle-assessment-of-evs/>