Announcement and Call for Contributions

Effects of EVs on

Land Use – Resources – Waste

incl. special topic: LCA of Autonomous Vehicles

Expert Workshop

June 13 – 14, 2019
Washington D.C., USA

Local organisers:

Argonne NATIONAL LABORATORY

Amgad Elgowainy; aelgowainy@anl.gov

Introduction

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 particulate 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) (Figure 1), 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.

The Implementing Agreement on "Hybrid and Electric Vehicle (HEV)" of the International Energy Agency (IEA) is operating the Task 30 "Assessment of Environmental Effects of Electric Vehicles" to examine the environmental effects of vehicles with an electric drivetrain based on life cycle analyses. The Task 30 started in 2016 and will continue until the end of 2020. 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.

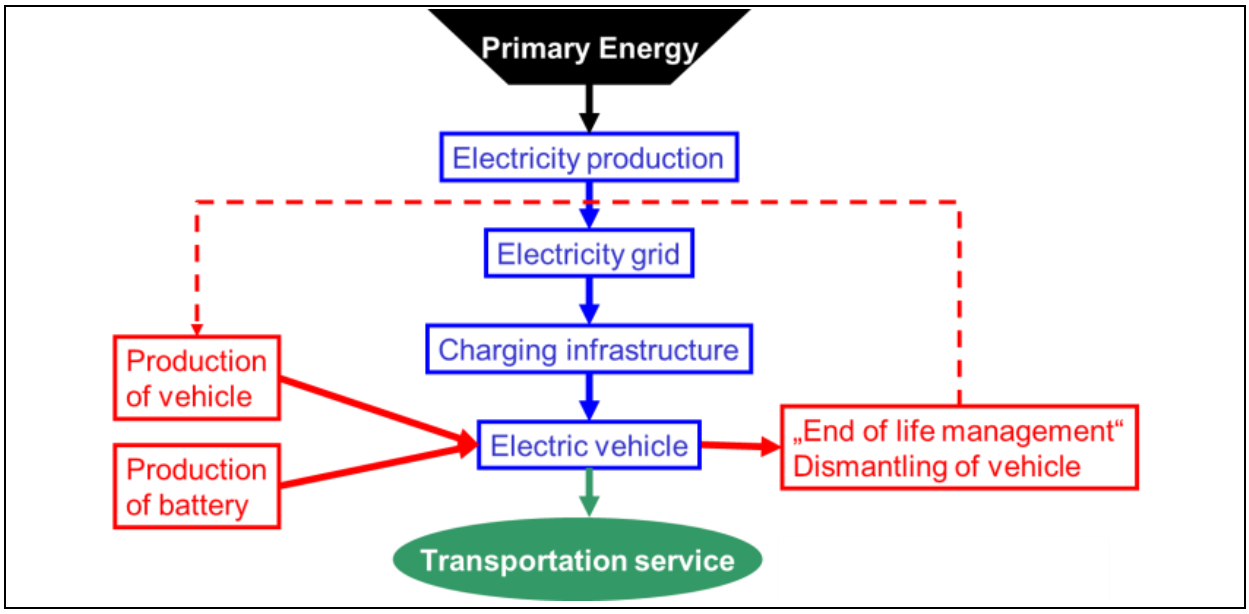

Figure 1: Key elements of the life cycle assessment of vehicles with an electric drive train

Aims of the workshop

The aim of the expert workshop of Task 30 is to analyse and assess environmental effects of electric vehicles (EVs) on land use, resources, waste based and autonomous vehicles on life cycle assessment in a cooperation of the participating countries in the International Energy Agency (IEA).

The aim of the workshop is to present and discuss the current status and the future perspectives of LCA of Electric Vehicles on these issues in comparison to conventional vehicles with an internal combustion engine (ICE). The main focus is on Battery Electric Vehicles (BEV) and Plug in Hybrid Electric Vehicles (PHEV).

The results of the activities of LCA activities in IEA HEV since 2012, and recent developments in LCA methodology development and its application to EVs will be presented. In a group of relevant stakeholder from government, industry, research and NGOs, the relevant issues of effects on land use, resources, waste and autonomous vehicles will be identified and discussed referring to the ongoing large scale market introduction of EVs and the rapid development of autonomous vehicles.

The main topics for the workshop are:

1. LCA methodology on land use, resources, waste and autonomous vehicles
2. Necessary inventory data
3. Case studies of EVs, ICEs, batteries, electricity and conventional fuel production
4. Identification of "hot spots"
5. Findings and Recommendations

The format of the workshop is based on presentations, discussion and group work.

CALL FOR CONTRIBUTIONS:

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 March 15, 2019** to **gerfried.jungmeier@joanneum.at**

Meeting Location

Argonne's office.
955 L'Enfant Plaza SW, sixth floor
Washington, DC 20024

Hotels

Hyatt Place Washington DC/National Mall
400 E St SW, Washington, DC 20024 +1 (202) 803-6110

Hyatt House Washington DC/The Wharf
725 Wharf St SW, Washington, DC 20024 +1 (202) 554-1234

InterContinental Washington D.C. - The Wharf
801 Wharf St SW, Washington, DC 20024 +1 (202) 800-0844

Holiday Inn Washington-Capitol
550 C St SW, Washington, DC 20024 +1 (202) 479-4000

Registration

There is no registration fee for this Workshop.

For registration please send a mail to

Gerfried Jungmeier
gerfried.jungmeier@joanneum.at

Further Information

For those travelling longer distance we recommend to also participate in the

Annual Merit Review 2019of the U.S. Department of Energy (DOE) Vehicle Technologies Office on June 10-13, 2019

The Annual Merit Review meeting will take place at Hyatt Regency Crystal City hotel in Arlington, Virginia, which is located at:

2799 Richmond Hwy, Arlington, VA 22202, +1 (703) 418-1234

https://www.energy.gov/eere/vehicles/annual-merit-review-registration

Contact Task Operating Agent

Gerfried Jungmeier
Operating Agent of IEA HEV Task 30 „Assessment of Environmental Effects of EVs"

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Task 30 "Assessment of Environmental Effects of Electric Vehicles"

Members: Austria, Canada, Germany, Spain, South Korea, Turkey, USA

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 analyzed 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.

The aim of Task 30 (2016 – 2020) is to analyze and assess environmental effects of electric vehicles (EVs) on water, land use, resources and air based on life cycle assessment in a cooperation of the participating countries in the International Energy Agency (IEA).

Task 30 is using the results of the completed Task 19 "Life Cycle Assessment of Electric Vehicles" (2011 – 2015, www.ieahev.org/tasks/task-19-life-cycle-assessment-of-evs/, led by JOANNEUM RESEARCH) as a foundation to subsequently examine the environmental effects – benefits and impacts - of vehicles with an electric drivetrain (EVs), based on life cycle assessment (LCA). With an eye on the three phases of LCA, such as production, operation and dismantling of EVs, various environmental effects of EVs on water, land use, resources and air, among others, will be analyzed and assessed. Thereby a strong accent is put on the comparison of environmental effects between pure battery EVs (BEV) and Plug-in hybrids (PHEVs) on one hand and conventional ICE vehicles using gasoline and diesel on the other side.

In recent years the focus in environmental assessments of electric vehicles was on global warming and primary energy consumption. But now it is recognized that other impacts gain additional relevance and must be addressed by life cycle based comparisons like water, land use, resource consumption, local PM and NO_x-emissions. Therefore Task 30 will focus on following topics covering methodologies, data and case studies:

- Effects of EVs on water (emissions to water, waste water, "Water Footprint" of EVs)
- Effects on EVs on land use-resources-waste (land use, occupation and degradation, demand of renewable and fossil resources, recycling)
- Effects on EVs on air (local emissions and effects of NOx, PM and CxHy, human health effect and non-energy related emissions from tires and brakes)
- Overall environmental effects and their assessment (comparing and assessing different impact categories, single score methodologies, stakeholder involvement).

Within the Task, methodologies for helping countries implement EVs by identifying possibilities to maximize the environmental benefits will be developed. Besides, various case

studies will be analyzed and networking combined with information exchange will be supported within the Task's frames (Figure 1). The Task will proceed by holding a series of expert workshops addressing the following objectives:

- Methodologies on assessment of environmental effects
- Analyses of necessary and available data
- Overview of international studies/literature
- Analyses of current knowledge and future challenges
- Overview of key actors and stakeholders and their involvement
- Communication strategies to stakeholders
- Summarizing further R&D demand

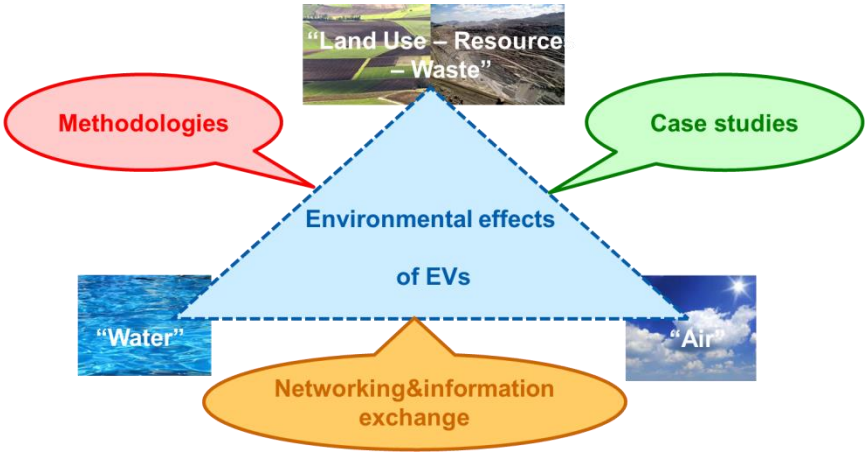

Figure 1: Working method in Task 30

Members in this Task will compile a list of environmental benefits and impacts of EVs with the goal to increase their overall acceptance by providing facts and figures on the environmental effects of EVs. Thus, numerous advantages of EVs compared to conventional vehicles will be shown. These results should help the industry and government to support further development and employment of EVs in all transport modes. The results will document and summarize the state of current knowledge and future challenges (incl. methodologies and case studies) on

- Effects of electric vehicles on water
- Effects of electric vehicles on Land use – resources – waste
- Effects of electric vehicles on air
- Overall environmental effects and their assessment of EVs
- R&D demand.

In addition to these technical and scientific results a glossary on "Frequently asked questions" (FAQ), a framework for Communication strategies to stakeholders and

dissemination activities (e.g. proceedings, reports, papers, notes, presentations) will be available.

Contact Details of the Operating Agents

For further information, please contact the Task 30 Operating Agent:

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www.ieahev.org/tasks/task-30-assessment-of-environmental-effects-of-electric-vehicles/