



TRAFIKVERKET



Region  
Gävleborg

# Welcome to the first International Electric Road Systems Conference 14-15 June 2017 Högbo Brukshotell Sandviken, Sweden



Hosted by :



EUROPEAN UNION  
European Regional  
Development Fund

Arranged by:



ITRL – INTEGRATED TRANSPORT  
RESEARCH LAB

KTH ROYAL INSTITUTE OF TECHNOLOGY



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## Program

(subject to change)



- 10.00 – 10.45 Optional: Presentation Region Gävleborg - ERS-site Elvåg E16
- 11.00 – 11.15 Bus from Högbo to Elvåg E16
- 11.45 – 12.00 Bus from Elvåg E16 to Högbo
- 11.00 – 13.00 Registration at Högbo Brukshotell
- 11.30 – 13.00 Lunch buffé is open
- 13.00 – 13.20 Opening of conference with Agneta Wargsjö
- 13.20 – 13.40 Key note speaker Dr Jacob Teter
- 13.40 – 14.00 Key note speaker Dr Håkan Sundelin
- 14.00 – 15.30 Presentations session – [Strategies and policies](#)
- 15.30 – 16.00 Coffee and poster session
- 16.00 – 17.30 Presentations session – [ERS Technology](#)
- 17.30 – 17.45 Closing of day 1
- 17.45 – 19.00 Posters / Recreational activities
- 19.30 Mingle with aperitif in the piano bar followed by dinner



- 08.30 – 09.00 Key note speaker Dr David Christensen
- 09.00 – 10.30 Presentations session – [Impact and benefit](#)
- 10.30 – 11.00 Coffee and poster session
- 11.00 – 11.20 Key note speaker Gereon Meyer
- 11.20 – 12.00 Industry panel
- 12.00 – 12.30 Conclusions
- 12.30 – 13.15 Lunch
- 13.15 – 15.15 Optional: Bus to Högbo Arlanda Drive Lab
- 15.15 – 16.00 Presentation Elways - ERS-site Arlanda and coffee
- 16.00 – 16.15 Bus to test track
- 16.15 – 17.15 Visit
- 17.15 – 17.45 Bus to Terminal 5 at Arlanda airport

## Key note speakers

**Agneta Wargsjö**

**Director Strategic Development**

**Swedish Transport Administration**

**Title:**

*ERS as a potential solution for fossil free transport system.*

**Abstract:**

A sustainable society is dependent on a well working transport system with a low environmental footprint. At the same time, analysis of future trends shows that transport operation in tonne-km will increase, for all modes of transport. Road freight transport faces a huge challenge in breaking the fossil dependency. Despite the planned avoid, shift and improve measures the challenge remains. Additional measures within the road transport sector would be needed to liberate the road freight transport sector from fossil fuels. Electric road systems could be one of these additional measures.



**Biography:**

Agneta Wargsjö is the Director Strategic Development at the Swedish Transport Administration. She is responsible for future and trend analysis, strategic planning, research and innovation, international affairs and is member of the executive management board at the administration. Agneta has a long experience within strategic planning of infrastructure and has been a member of TRB Committee, CEDR task group research, PIARC group on Good governance of road administration and Performance of transport administrations. Agneta is also the steering committee chair of the Swedish pre-commercial procurement of electric road systems which is responsible for the electric road systems at Sandviken and Arlanda.

**Dr. Jacob Teter**  
**Energy Analyst**  
**International Energy Agency**

**Title:**

*How ERS is a key technology enabling CO<sub>2</sub>-reduction of road traffic and reaching the 2 degree goal.  
Technologies and events that take us to the right future.*

**Abstract:**

The relevance of transport, and within transport road freight, for the global energy sector cannot be overstated. At around 52 million barrel of oil per day (mb/d) [in primary energy], transport accounts for more than half of global oil demand, and hence emits nearly one-quarter of global total energy-related carbon dioxide (CO<sub>2</sub>) emissions. Sectoral oil demand and emissions are both growing rapidly, and within developed countries, nearly all of this growth is attributable to road freight. Trucks constitute a key segment of global oil demand: oil use by trucks is second only to that of passenger vehicles (which consume around 24 mb/d) and nearly as high as all oil use by the industry sector. As a result, road freight transport alone emits 2.3 Gt of CO<sub>2</sub> today, or 7% of total global energy-related CO<sub>2</sub> emissions. Indeed, in both IEA the Reference Technology Scenario (RTS) and the 2-Degree Scenario (2DS), energy demand and greenhouse gas (GHG) emissions from road freight are expected to surpass those of passenger road vehicles in the early 2030s to become the greatest single sectoral energy consumer and GHG emitter within transport. Relying upon recent work to update and calibrate historical data on global road freight fleets and trends in truck energy efficiency, sales and stocks, vehicle and service (tonne-kilometre) activity, as well as revised demand projections for the goods delivery services provided by road freight, this presentation seeks to outline the measures that would be needed to realize 2DS in the sector, and to highlight the role that Electric Road Systems (ERS) play in the 2DS toward decarbonisation targets by mid-century and in the latter half of the century.

**Biography:**

Dr. Jacob Teter is a Transport Energy Analyst for the International Energy Agency. His focus at the IEA is on modeling technologies and policies using the IEA Mobility Model. He holds a Ph. D. in Transportation Technology and Policy. Jacob has written and published various papers on transportation policy and climate change. He is the desk officer for Advanced Fuel Cells (AFC) and Advanced Materials for Transportation (AMT) Implementing Agreements.



**Dr. Håkan Sundelin**  
**Senior Researcher**  
**RISE Viktoria**

**Title:**

*ERS research in Sweden and around the world.*

**Abstract:**

Electric road systems (ERS) have the potential to reduce carbon dioxide emissions from the transport sector. ERS are today tested on public roads in multiple locations around the world. The basic technologies of ERS has been developed through various research projects across the globe. The presentation will give a brief overview of research activities around the world and provide a deeper presentation of past and present research projects in Sweden. The purpose and goal of the Swedish Research and Innovation Platform for Electric Roads will be presented and finally future challenges will be highlighted.



**Biography:**

Dr. Håkan Sundelin is a senior researcher in electromobility projects at RISE Viktoria. He is currently the project leader of the Research and Innovation Platform for Electric Roads in Sweden. He is also work package leader of the research project ERSET which aims at creating analysis methods and tools to support optimal implementation of Electric Road Systems (ERS) in the Transport system. He has a long industrial background from Scania where he has been evaluating and testing the concept of electric roads using both inductive and conductive power transfer in many different research projects.

**Dr. David Christensen**  
**Executive Director of the Center for Sustainable Electrified Transportation (SELECT)**  
**Utah State University**



**Title:**

*Inductive ERS: concept, economics, test results and upcoming pilots in the US.*

**Abstract:**

Inductive technologies for electric road systems offer the potential for cross-compatibility from light to heavy-duty vehicles on the same roadway. This talk will provide updates on inductive ERS from the university, industry and government partners at the Center for Sustainable Electrified Transportation (SELECT). Topics covered include an overview of the concept and technology options for roadway integration, a summary of cost-benefit techno-economic analysis, hardware results from the SELECT test track, and plans for upcoming pilot projects in the US.

**Biography:**

Dr. David Christensen holds a professional practice position in the Department of Electrical and Computer Engineering at Utah State University and serves as the Executive Director of the Center for Sustainable Electrified Transportation (SELECT). He leads the Center's strategic direction and commercialization activities as well as coordinates research collaborations between academic partners, government funding agencies, and industry members. He is currently coordinating multiple efforts between SELECT and its partners to launch pilot projects for inductive electric roads in the US.

**Dr. Gereon Meyer**  
**Head of Strategic Projects**  
**VDI/VDE Innovation + Technik GmbH**

**Title:**

*European Roadmap Electrification of Road Transport.*

**Abstract:**

Jointly edited by the European Technology Platforms ERTRAC, EPoSS and ETIP SNET, the European Roadmap Electrification of Road Transport provides background information and R&D&I roadmaps for the electrification of the different vehicle categories. Its 2009 and 2012 editions have been the major source of recommendations for the calls by the European Green Cars Initiative in FP7, followed by the European Green Vehicles Initiative in Horizon 2020. In early 2017, the 3rd edition of the document was published. It extends the outlook until 2030 and roadmap distinguishes four areas of action, (a) operation System dependent EVs in the urban environment (b) user-friendly affordable EV passenger cars + infrastructures, (c) no compromise electric urban bus system, and (d) sustainable electrified long-distance trucks and coaches.



**Biography:**

Dr. Gereon Meyer, Head of Strategic Projects with the Future Technologies and Europe department of VDI/VDE Innovation + Technik in Berlin, earned his Ph.D. in Physics from the Freie Universität Berlin. Before joining VDI/VDE-IT in 2007 he was an Alexander von Humboldt fellow and researcher at Stanford University, Palo Alto, CA (USA), Hitachi Global Storage Technologies, San Jose, CA (USA) and Lawrence Berkeley National Laboratory, Berkeley, CA (USA). At VDI/VDE-IT, Dr. Meyer is an expert for electronics and ICT for the automobile of the future. He is the chairman of the Int. Forum on Advanced Microsystems for Automotive Applications (AMAA), and leads the activities of the Working Group Automotive of the European Technology Platform on Smart Systems Integration (EPoSS). Dr. Meyer is a member of the industry delegation of the PPP European Green Vehicles Initiative, an Operating Agent in charge of information exchange in the Technology Collaboration Programme Hybrid and Electric Vehicles of the International Energy Agency, and the editor of the Springer book series Lecture Notes in Mobility. Dr. Meyer also serves as rapporteur for the European Roadmap Electrification of Road Transport.



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## Sessions

### Strategies and policies

#### **ERS in a Technology-neutral Policy Environment**

Julius Jöhrens, Julius Rücker, Hinrich Helms

Institute for Energy and Environmental Research, Heidelberg, Germany

#### **Electric Road Systems: The importance of technology sharing**

Francisco J. Márquez-Fernández, Gabriel Domingues-Olavarria, Lars Lindgren and Mats Alaküla, Lund University and Swedish Electro mobility Centre

#### **Repurposing the Electric Road as an In Motion Charging System for Battery Electric Trucks**

Roger Bedell, Opbrid Charging Systems, Furrer+Frey AG, Bern, Switzerland

#### **Traffic operations and electric road systems**

Joram Langbroek and Joel Franklin, KTH Royal Institute of Technology, Jubin Jacob and Gerdien Klunder, TNO

#### **Business case for electric roads**

Håkan Sundelin, Ann-Charlotte Mellquist, Marcus Linder, Martin Gustavsson, Conny Börjesson and Stefan Pettersson, RISE Viktoria

## ERS Technology

#### **Ground-level feeding systems: From rail to road transport**

Patrick Duprat, Jean-Luc Hourtane, Philippe Veyrunes, Alstom, France

#### **Analysis of a large scale ERS pilot**

Christofer Sundström and Håkan Sundelin, RISE Viktoria

#### **Continuous electric energy transfer for heavy road vehicles**

Peter Östman, Bombardier Primove

#### **Automatic conductive charging of electric cars**

Martin Gustavsson and Conny Börjesson, RISE Viktoria

Robert Eriksson and Mats Josefsson, Volvo Cars

#### **Standardization and Regulation approaches towards an interoperable European overhead contact line ERS**

Karsten Hunger, DKE Deutsche Kommission Elektrotechnik, Frankfurt, Germany

Michael Lehmann, Siemens AG, Erlangen, Germany

Niklas Petersson, Scania CV AB





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## Impact and benefit

### **Impact on CO2 emissions and infrastructure cost from electric road systems – The case of Norway and Sweden**

Ludwig Thorson, Maria Taljegard, Mikael Odenberger and Filip Johnsson, Chalmers University of Technology

### **Energy demand from a highway using ERS – A case study in Sweden**

Darijan Jelica, Maria Taljegard, Ludwig Thorson and Filip Johnsson, Chalmers University of Technology

### **Fuel Displacement Potential of ERS on the European Motorway Network**

Jakob Rogstadius, Christer Thorén and Nils-Gunnar Vågstedt, Scania CV AB  
Håkan Sundelin, RISE Viktoria

### **Electric Road Systems from a Strategic Sustainability Perspective**

Jesko Schulte and Henrik Ny, Blekinge Institute of Technology

### **Electric Road Systems in Driving Simulator**

Arne Nåbo, VTI – Swedish National Road and Transport Research Institute

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## Poster sessions

### **Electric Infrastructure for Goods Transport, ElinGO, status & technology**

Runar Söråsen, Milesahead

### **Test of in-road conductive electric feeder system**

Mikael Hellgren, KTH, Integrated Transport Research Lab

### **FABRIC status**

Yannis Damousis, Institute of Communication & Computer Systems

### **Energy system model for electric roads**

Anders Malmqvist, KTH, Dept. for Energy Technology

### **The business models challenges of Stop Inductive Electric Charging Bus System case**

Rami Darwish, KTH, Dept. Industrial Economy and Management

### **E-way overall program**

Jacques Van Wittenberghe, Observatory for Innovation in Energy, OIE

### **Exposing Electric Road System stakeholders network**

Qiuchen Wang, KTH, School of Technology and Health

## The Venue

Högbo Brukshotell is beautifully located on the countryside just outside Gävle/Sandviken, approximately 1,5 hour (by car) from Stockholm/Arlanda airport. Högbo Bruk is a unique combination of nature, activities and cultural history. The facility offers restaurant, bar, conference centre, hotel rooms, pool & relaxation area, visitor's shop, free wifi and more.

## While you are here!

Take the opportunity to explore the surroundings in your spare time. There are numerous activities to choose from *and it is complimentary just for you\**. Just let the reception know upon arrival or anytime during if you are interested in any of the activities and they will help you with the details. You can read more about the activities at the [Högbo Brukshotell website](#).



\*SPA treatments are not included but enjoying the pool- and relaxation area is free of charge.

## How to get there

### By car

**From Gävle:** E16 west towards Sandviken

**From Stockholm /Uppsala /Gävle:**

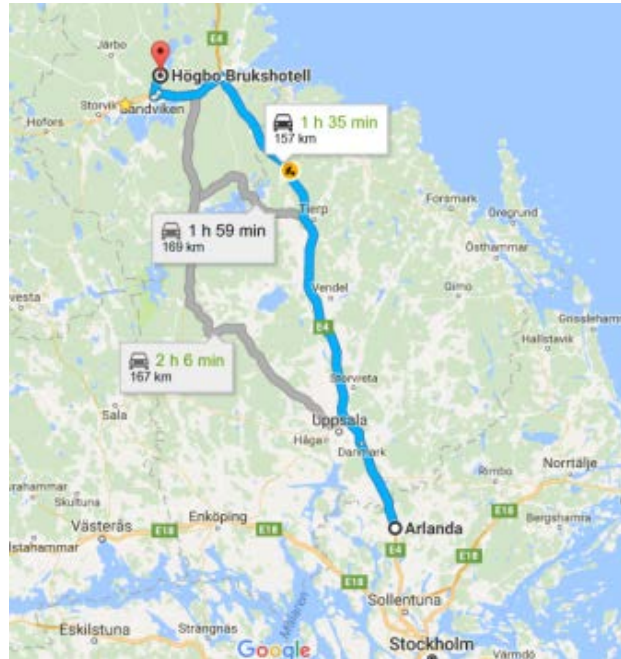
E4 north to Gävle, Sandviken exit at E16.

### By train

The nearest train station is located in central Sandviken, at Sandviken Travel Center six kilometers from Högbo.

**Address:** Hans Hiertas Väg 5, Högbo bruk,  
811 92 Sandviken

**GPS Coordinates:** N 60 ° 40'20.0 "E 016 ° 48'44.2"



**Price and reservation:** SEK 1375 incl breakfast and VAT. Book via e-mail [reservations@hogbobrukshotell.se](mailto:reservations@hogbobrukshotell.se) and use the code "ERS-conference".

Please note that after the conference on June 15<sup>th</sup>, a bus will depart at 14.00 from Högbo going to the Arlanda test track for a field study after which the bus will continue to Terminal 5 at Arlanda International Airport.