COP 24

Innovations in Low Carbon Transport

Wolfram Schwab
6th December 2018

ALSTOM
Designing fluidity
Clear political objective: drastic reduction of $\text{CO}_2$
Our railway sector contributes!

The head of the Paris Conference, France's foreign minister Laurent Fabius, said this "ambitious and balanced" plan is a "historic turning point" in the goal of reducing global warming
The role of Rail

- The least polluting means of moving people and goods in large quantities
- Responsible for 1.9% of final energy demand and 4.2% of CO₂ emissions of the transport sector*
- Transported 6.3% of global passengers (passenger-km) and 6.9% of global freight (tonne-km) in 2015*

Backbone of low carbon motorised transport for cities and regions

*Source: EEA 2017
Our vision of the mobility of tomorrow

- Rapidly develop environmentally friendly materials and solutions
- Imagine lighter infrastructure that is easily integrated
- Accompany a seamless transition from door to door

High capacity mobility, faster, easier
Levers to improve the energy consumption of our trains

Objective: -20% energy consumption from 2014 to 2020

- Weight reduction
- Braking energy recovery
- Intelligent traction control
- Energy storage
- Highly efficient HVAC
- Reduced train motion resistance
- Energy management systems
- Efficient traction trains

-15% energy consumption of our solutions realized to date
Hydrogen as key towards Emission-free Mobility

Alstom’s contribution
Coradia iLint
Key drivers for public transport

- Environmental needs
- New regulations
- New technology
- Economical solutions
- Sustainable public transport

* Source: UN Sustainable Goals
It’s all about Energy and Weight

Energy density (in MJ/kg)

Coal

Diesel

Hydrogen

34 MJ/kg

43 MJ/kg

120 MJ/kg
The manufacturing method of the hydrogen is decisive for the savings of CO₂

Major decrease of CO₂ emission

-45%  

Diesel-Lint

H₂ out of natural gas reformation

H₂ out of electrolysis with „Green Electricity“

…equals annual emissions of 400 cars

minus 700t CO₂ per year…

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Our vision: A joint service out of one hand – emission-free availability!

Operator receives a maintained and tanked vehicle!

Construction and operation of the H2 infrastructure (with partners)

Delivery of the trains

We provide emission-free availability

Maintenance and service
Coradia iLint in daily passenger service
Back-up

Contact

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Enabling Energy Transition and Climate Change Mitigation in Transport

**OUR PLEDGE FOR CARBON NEUTRALITY IN TRANSPORT**

The implication of the Paris Agreement is clear: to limit the rise in temperature to +2°C by the end of the century, carbon neutrality must be achieved by 2050. Transport is one of the human activities whose CO₂ emissions continue to rise. There is an urgent need to reduce the environmental impact of transport. Alstom is committed to supporting carbon neutrality in transport and has adopted a “Climate and energy transition strategy” along three lines:

- **PLACING ENERGY-EFFICIENT ELECTRICAL RAIL SOLUTIONS AT THE HEART OF OUR PORTFOLIO**
  - Alstom, first manufacturer to set a target on energy efficiency of its solutions
  - Commitment to reduce the energy consumption of our solutions

- **ENABLING THE TRANSITION TO SUSTAINABLE MOBILITY SOLUTIONS**
  - Develop and promote efficient alternatives to diesel trains such as electrification, hybrid traction and hydrogen trains
  - Expand our range of low carbon mobility solutions for cities and infrastructure for long distance transport

- **DECARBONISING OPERATIONS**
  - Reach carbon neutral operations through a step by step approach
  - Energy intensity in permanent facilities in kWh/hours worked
  - Objective: -10% by 2020 vs 2014
  - Electricity supply from renewable sources
  - Objective: 100% by 2025

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Introduction
The Sustainable Low Carbon Transport Partnership (SLoCaT), together with the Paris Process on Mobility and Climate (PPMC) the European CIVITAS initiative and the Municipality of Katowice are hosting a Transport Day event on Thursday 6th December, 2018 on the occasion of COP24. The event will take place at the City Hall of Katowice on Thursday December 6th from 09:00 to 18:00 and will be followed by a cocktail reception. The Transport Day Program will combine morning and afternoon plenaries with six breakout sessions. The topics of the six breakout sessions and their leaders are presented below:

Morning Breakout Sessions

- Electrification of Public Transport led by UITP
- Financing Transformation and Low Carbon Mobility led by Islamic Development Bank and GIZ
- Adaptation: Adapting to new climate in the transport sector led by UIC, PIANC and JDCL

Afternoon Breakout Sessions

- Emissions Reduction Targeting in Urban Transport led by GIZ
- Innovations in Low Carbon Transport led by Alstom
- Walking and Cycling led by CIVITAS

The Innovations session
Alstom has been invited to organize/lead the break-out session on the subject of Innovations in Low Carbon Transport - new innovations which will help to reduce GHG in general, and CO2 in particular, with the targets of the Paris Agreement in mind. The session will last 90 minutes. The intention is to have maximum 6 panelists covering a range of motorized transport modes. Each panelist would have 10-12 minutes to present on the innovations that he/she believes to be the most pertinent (Max. 8 slides each). This would be followed by an open panel session coordinated by an animator with question invited from the audience.

The draft outline is as follows: *please note that the order of speaking is not yet definitive*

Panelist 1: Rail industry: Wolfram Schwab – VP R+D and Innovation, Alstom S.A.
Panelist 2: Rail operator: Andreas Gehlhaar - Head of DB Environment *(title to be confirmed)*
Panelist 3: Automobile industry: TBC *(Renault or BMW)*
Panelist 4: Automotive operator: TBC *(Uber)*
Panelist 5: Bus industry: TBC *(Volvo)*
Panelist 6: Supply industry: Nicolas Beaumont, SVP Sustainable Development and Mobility, Michelin
Animator: Barry Howe – Sustainable Mobility Director, Alstom S.A.