ALSTOM Hybridlokomotiven – Technik und Wirtschaftlichkeit im Schienengüterverkehr

Technics and economics in rail bound Freight Business

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Technical principle

Energy production & store
- Generator Modul 200KW

Transformation
- Compressor
- Auxiliaire 400V
- 24V DC
- Aux. Battery

Energy usage
- Traction motors
- Mx

Basis: 200 KW Dielectric shunter
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- Traction motors
- Mx
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- Aux. Battery
- 24V DC
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Hybrid: 200 KW Dieselelectric shunter plus Batterie Booster for Peak Power!
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  - Mx
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Hybrid: Batterie refilled during traction OFF time!
Technical principle

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Battery Modul

Generator Modul 200KW

Transformation

Energy usage

Traction motors

Mx

Compressor

Auxiliaire 400V

24V DC

Aux. Battery

Hybrid: Generator Off time 50%!
Advantages of Concept

- **Diesel**
  - Fuel saving: appr. 40%

- **Emissions**
  - Reduction of emissions: appr. ca. 50%

- **Noise**
  - 10dB(A) decrease (while generator runs)

- **Redundancy**
  - Return with only one energy source
When to use Hybrid-Technology?

Main principles for Hybrid operation

• Heavy shunting business
  (Replacement of classical 500 to 700kW shunters)
• No long runs with heavy load
• >60% idling time during operation
• High speed only without heavy

=> Comparable with Hybridcars in city traffic!
Test Results BR203 H

Test at MEG and DB Regio Nürnberg

- Fuel Saving: 34 - 43% depending on profile
- Diesel-ON-time: 40 - 46% operational time
- Max Batterie operation: 1 h: 19 min 300 t Load at 10 km/h
- Calculated traction force: 190 kN v < 7 km/h
- Max. Speed with 300t: 55 km/h

Actual test: Rotterdam Harbour (April & May 2009)
Commercial evaluation

High level full cost analysis

– Fuel saving: 40% 30K€ pa
– Maintenance costs: Saving on: Motor, Cooler compensates: Batteries (6 year interval)
– Technology costs: 200 K€ higher than new 500KW DH Loco

=> Pay back from day one
Leasing: positive
Purchase: break-even after 4 years

Alternative: Full-Renovation of existing Locomotives even more attractive!
Next steps

- Prototype test runs
  Ongoing in Europe
- First test fleet
  6 years tests in daily service
- Fit for Market
  2011

Specific Questions:

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