



IRTENZ Conference

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A close-up photograph of an electric vehicle's charging port. The port is open, revealing a black charging cable with a silver connector plugged into it. The car's body is a dark, metallic blue-grey color. The background is slightly blurred, showing the car's window and door handle.

Power Train Decarbonisation

- Motive power
- Emissions – exhaust / other
- Drive train

Motive Power Sources

- Diesel
- Biofuels
- E-Diesel
- Dual Fuel
Hydrogen/diesel
- Electric - Hydrogen/
battery
- Hydrogen – ICE
- Ammonia





Diesel

Diesel



Recent technologies

- Cooled EGR
- Multi/variable turbo
- Piezo injectors
- Common rail
- ECU management
- Fuel Quality

Selective Catalytic Reduction

- Reagent Fluids
- Particulate control
- Thermal management
- Artificial Intelligence- After treatment control

Biodiesel and E-Diesel

- Carbon neutral
- Shortage of feedstocks
- Low investment
- Direct drop in fuel for existing fleet



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Diesel RCCI/HCCI



- Diesel ignition of a low reactivity fuel
- Gasoline or ethanol
- Cleaner and more efficient than petrol or diesel

An abstract graphic consisting of several concentric rings made of small, dark teal rectangular segments, creating a textured, circular effect. The word "Hydrogen" is centered within this pattern.

Hydrogen

Dual Fuel Hydrogen / Diesel



Hydrogen charge with Diesel injection (pilot / partial/ full diesel)

- NOx emissions
- Exhaust after treatment systems

Hydrogen - ICE



- Development of existing engine technologies
- Ignition system and combustion chamber design
- Hydrogen supply networks need to be established-range
- Exhaust after treatment systems still required – Nox emissions
- Major research – Ricardo technology support

Hydrogen Fuel Cells

- Existing technology
- Battery storage diminishes payload.
- Hydrogen infrastructure still evolving
- Liquid or gas Hydrogen



Future Fuels - AMMONIA NH_3



High energy density fuel.

Better thermal efficiency than current fuels

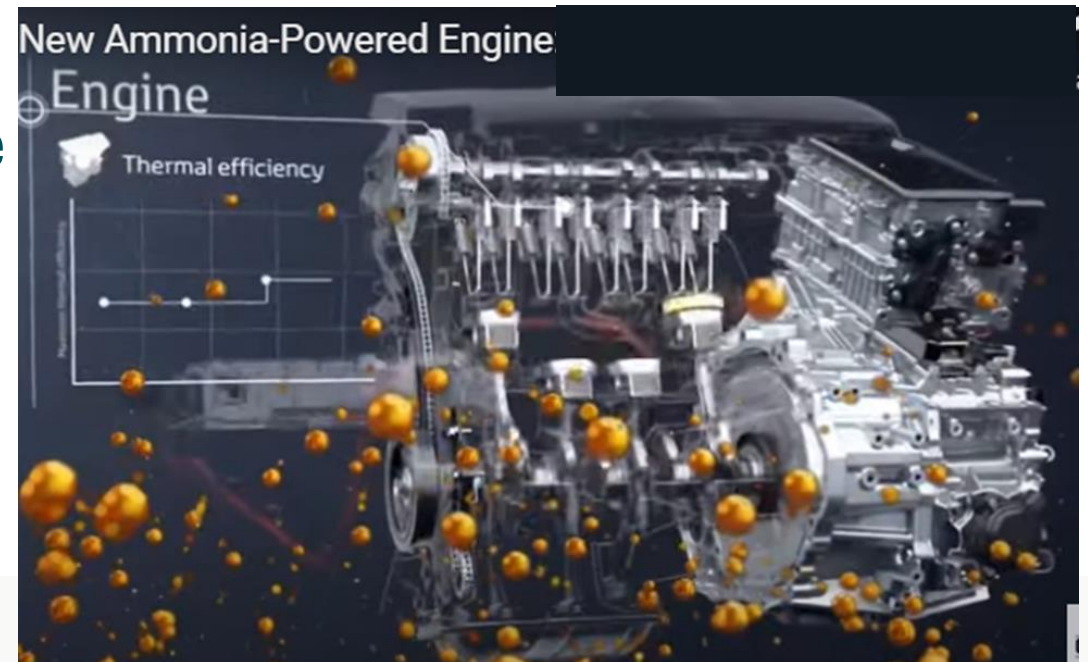
Suitable for car and HCV

Low emissions

Research into green feedstock source

After treatment still required

Liquid form for long range usage

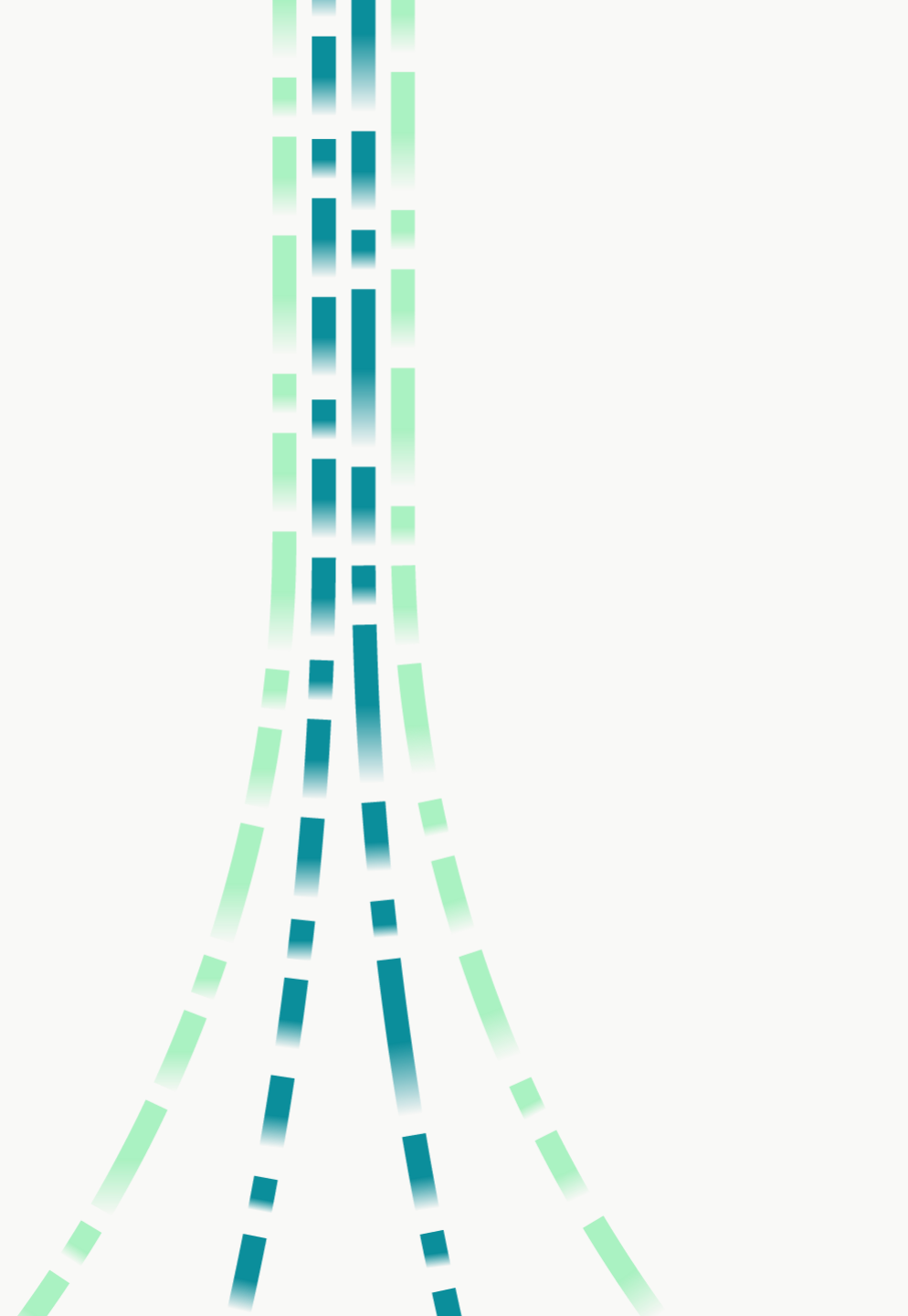


An abstract graphic consisting of several concentric rings made of small, dark teal rectangular segments, creating a textured, circular effect. The word "Emissions" is centered within this graphic.

Emissions

Emission Standards

- Euro VII-looking at 56% reduction 2035
- Extended durability
- Brake dust
- Rubber wear
- Rolling resistance



Transmissions, Diffs, Tyres



- Optimizing gear splits/ratios
- Automated manuals / auto
- Dual clutch trans
- Hard lubrication-gear coating
- Low rolling resistance tyres



E-Trailers



- Regulations UN R13 / ISO11992-2
- Smart connectivity
- Shared battery load distribution
- E-axles –driven axles throughout the configuration
- Electric endurance brakes/retardation

- Stability/control -anti sway
- Compatibility issues

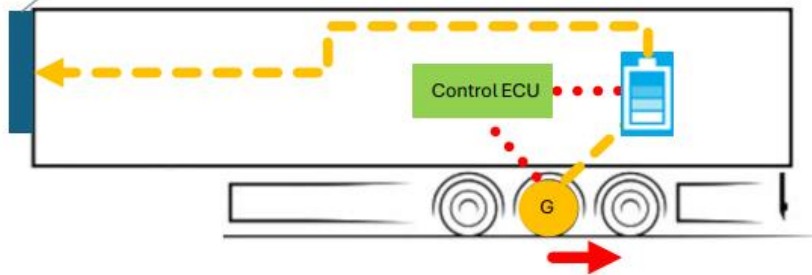


E-Trailers



Dynamo trailer

The trailer recuperates energy for trailer users, e.g. a cooling unit (usually energy consumption < 20 kW)



- Data communication
- - - - - Power flow
- force

E-trailer

The trailer recuperates energy and provides propulsion. Trailer users (cooling unit) may be installed as well.

