Road Freight Operator’s statement
Sustainable and competitive solutions
Aldo Celasco,
IRU Senior Manager
The world's road transport organisation

IRU is the global voice of companies providing commercial road transport, mobility and logistics services.
Our members are national road transport associations, mobility and logistics operators, industry bodies, research and academic institutes and leading companies supplying the sector.

From safety to innovation, environmental standards to trade policy, urban access to driver shortages, IRU works on issues at the very heart of the industry.
MISSION

Bring together business, partnering with those who regulate, serve and use our industry by:

- Being the trusted voice for mobility and logistics
- Facilitating the transport of people and goods
- Championing excellence in road transport
Industry committed to decarbonising

Urge other stakeholders to play their part

Call on governments to create an enabling environment

IRU 2050 DECARBONISATION VISION
Energy density and energy content of energy carriers

### Energy Density (GJ/m³)
- **Diesel**: 35
- **LNG**: 20
- **CNG**: 14
- **Liquified hydrogen**: 8
- **Li-Ion Battery**: 2

### Energy Content (MJ/Kg)
- **Hydrogen**: 120
- **Natural Gas**: 48
- **Petrol/Diesel**: 43
- **Solid-mass Battery**: 4
- **Li-Polymer Battery**: 0.55
- **Li-Ionic Battery**: 0.36

**Best options for international transport:**
1. Diesel
2. LNG
3. L-H2
4. CNG/H2
5. BEV

Measurement units: GJ/m³ for energy density, MJ/Kg for energy content.
Well-to-wheel emissions of diesel, natural gas, electricity and hydrogen

- Diesel
- Natural gas
- Electricity
- Hydrogen

**EUROPEAN UNION (kg CO₂/GJ)**

- Diesel: 90
- Natural gas: 66 (-26%)
- Electricity*: 107 (+19%)
- Hydrogen*: 175 (+96%)

**USA (kg CO₂/GJ)**

- Diesel: 91
- Natural gas: 77 (-15%)
- Electricity*: 125 (+37%)
- Hydrogen*: 111 (+21%)

**CHINA (kg CO₂/GJ)**

- Diesel: 91
- Natural gas: 72 (-21%)
- Electricity*: 168 (+80%)
- Hydrogen*: 180+ (+98%)

*Hydrogen and electricity emissions based on the average regional electricity mix

Sources: ADEME, GLEC, JRC (EU); GREET (USA); Life Cycle Greenhouse Gas Analysis of Multiple Vehicle Fuel Pathways, Peng T. et al, 2017 (China)
BEV @2050: never more than 50%

Electrification alone will not achieve climate neutrality

- Policy makers cannot dream to have 100% BEV @ 2050
- European Commission Study indicates most probably target achievable less than 50%
- IRU calculations foreseen by 2080 a possible 100% BEV market
- Actions are needed today

Source: PRIMES model
Different transport activities are suited to different fuels and technologies.
CO₂ abatement cost

- Fuels have to be renewable
- Costs increase has to be offset by Green Taxation (High Carbon Price)
- Only Well to Wheel approach will allow the sector to fully decarbonise
- Operators invest in ~ 300000 new trucks/year

TCO – Total cost of ownership (focus on vehicle and fuel cost)*

<table>
<thead>
<tr>
<th>EURO</th>
<th>Vehicle cost</th>
<th>Fuel cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel truck</td>
<td>100k</td>
<td>1.10 ~1.40</td>
</tr>
<tr>
<td>LNG truck</td>
<td>+20%</td>
<td>- 30 %</td>
</tr>
<tr>
<td>BEV</td>
<td>+ 200% ~ +300%</td>
<td>+ 300% ~ +400%</td>
</tr>
<tr>
<td>H₂</td>
<td>TBC</td>
<td>+100%</td>
</tr>
</tbody>
</table>

* Average assumptions
Make commercial road transport fully carbon neutral by 2050

based on:

- Alternative Fuels
- Eco-trucks
- Collective Passenger Transport
- Vehicle Efficiency
- Driver Training & Monitoring
CONCLUSIONS

• CNG/LNG and Biofuels are the most promising alternatives to diesel for the immediate future
• Batteries not suitable as an energy storage medium for commercial vehicles
• Hydrogen fuel cell vehicles and infrastructure need further development and a positive business case
• ICE (based on liquid and gaseous) alternative/synthetic/renewable fuels will continue to play a key role towards 2050
• Measuring of CO$_2$ emissions should be based on a lifecycle approach (better fuel efficiency and better fuels equally important)

Operators need all alternative fuel options on the table as there is no silver bullet and different solutions will serve different use cases
For a world in motion