## Dear sirs,

**Green Propulsion** wants to react to the Euro VI proposal for Heavy Duty Vehicles as an **Independent Research Center** specialized in low emissions vehicles, having already built different prototypes.

The trends towards new drivetrain technologies will probably not keep a **classical engine + gearbox configuration**. Instead of them, electric traction motors without gearbox eventually in parallel with an engine may move the future Heavy Duty, taking their energy from batteries, fuel cell - thus hydrogen - or any substitution fuels.

How can a company like Green Propulsion, developing these prototypes, announce Euro level emissions, which is a crucial point to market them? Selling an expensive but real "low emission vehicle" will still be impossible if this Euro VI standard keeps its **obsolete measurement methodology based on engine testing only**! The **weight of the vehicle, its gearbox ratios, driving cycle, power take off,... are simply not taken into account**!

What do we propose?

To test complete vehicles, whatever their technology, on chassis dynamometers would necessitate complicated and expensive benches, even multiplied by the number of vehicle variations to test. To test them on tracks with human or robot drivers would not be repeatable (changing weather conditions) nor precise and need mobile emission measurement systems.

Let's then **test any complete motorization**, whatever its technology, from its output driveshaft normally going to the differential, here redirected to a classical **engine test bench slightly adapted**. The testing machine may need an improved torque capability at low speed and a electronic control strategy based on a vehicle simulation. Battery electric; series, parallel and combined hybrids; fuel cells can be tested on the same machine at no more cost than today. Instead of Euro VI we should define first:

- representative driving cycles for every typical applications (bus, garbage truck, delivery,....),

- vehicle weight subclasses to which we adapt the vehicle simulation parameters,
- typical power take off cycles

Side effect of this new methodology: typical fuel consumption and CO2 emissions in g/km could also be given, to help the future buyer to compare different solutions. Can we continue to consider that Heavy Duty vehicles are not concerned by the Kyoto Protocol because we simply don't know in advance their energy consumption?

Europe should be leading towards **more representative testing methods** and give a chance for low emission/consumption technologies to prove their efficiency compared to more "commercial" solutions.

Best regards,

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