



# Hybrid GRPE workshop on the future of power determination regulations

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# Agenda

1. Background
2. Implementing System Power determination within the UN Regulation
3. Legislative structure – Scenarios
4. OICA proposal for GTR21 implementation
5. Scope and purpose of LD power determination
6. Roadmap
7. Documentation

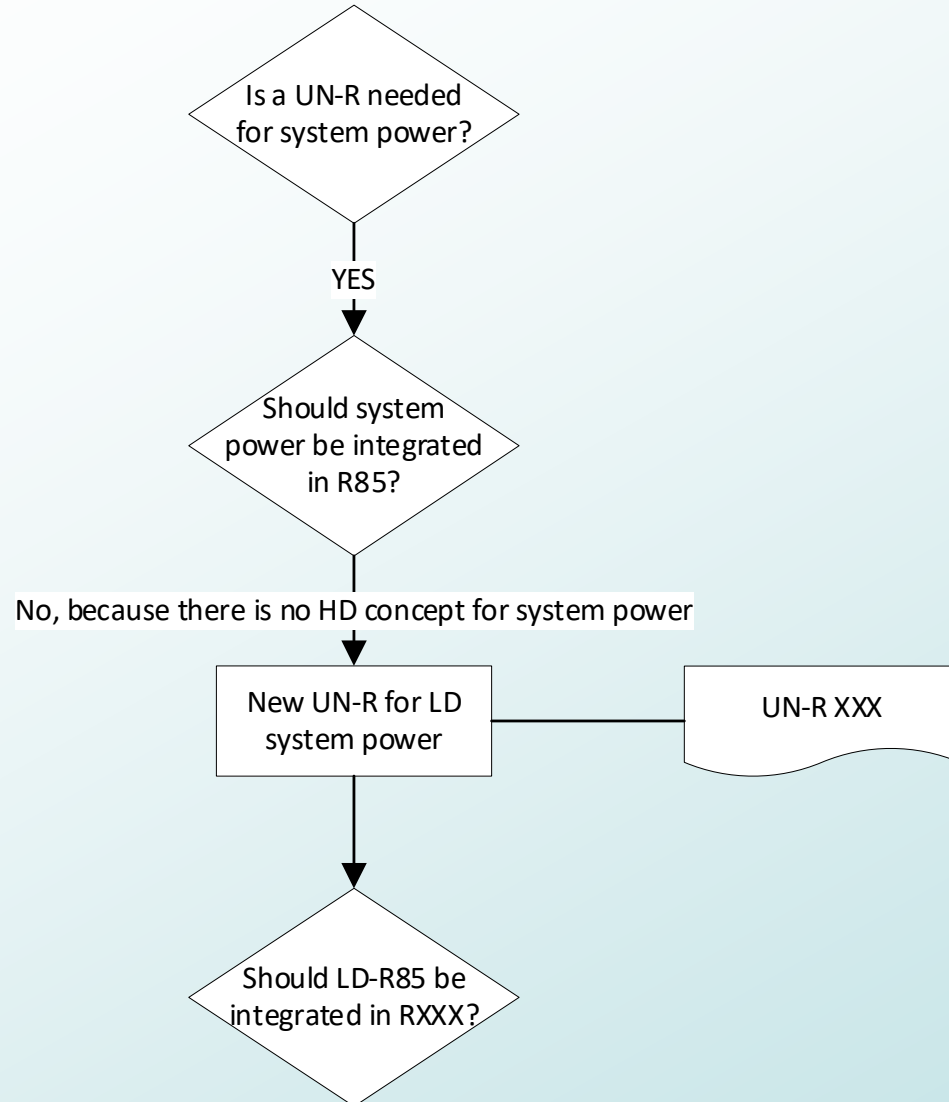


# Background

- OICA has raised concerns in multiple GRPE sessions regarding the future of determination of propulsion power and system power. OICA members can only comment the regulations affecting on road vehicles.
- The EU intends, maybe as the first region in the world, to integrate GTR 21 (Determination of Electrified vehicle power for hybrid vehicles and vehicles with more than one electric machine) for light duty vehicles into EU7 .
- UN-R85 applies to internal combustion engines and electric machines (propulsion energy converters) intended for the use in vehicles of category M and N individually, whereas GTR21 additionally applies to light-duty vehicles whose propulsion system (propulsion energy storage and converters) consists of multiple propulsion sources (e.g. combination of ICE and electric machine, multiple electric machines).
- Vehicles with features temporarily affecting the available power are being considered in response to customer use cases



# How to implement System Power determination within the UN Regulation?



- In OICA's opinion a new UN-R XXX is needed to address the system power determination.
- Different Scenarios for the implementation of a new UN-R XXX are possible.



# Legislative structure - Scenarios

## Assumptions:

LDVs will still need R85 approvals for non-58 Agreement countries

Having component requirements in 2 UN-Rs increases risk of diverse requirements

Scenario 1

UN-R 85.00 **HD & LD**  
component

UN-R XXX **LD**  
system

- Minimum disruption
- E.g. hybrid with 1 ICE and 1 e-motor has 3 approvals
- 2 Regs for „1 subject“ in future

Scenario 2

UN-R 85.00 **HD & LD**  
component

With wording to state that for LDV only R85 or Rxxx is necessary

UN-R XXX **LD**  
System & component

- Minimum disruption
- 1 Reg for „1 subject“ if the world moves to system power
- E.g. hybrid with 1 ICE and 1 e-motor has 5 approvals

Scenario 3

UN-R 85.00 **HD & LD**  
component

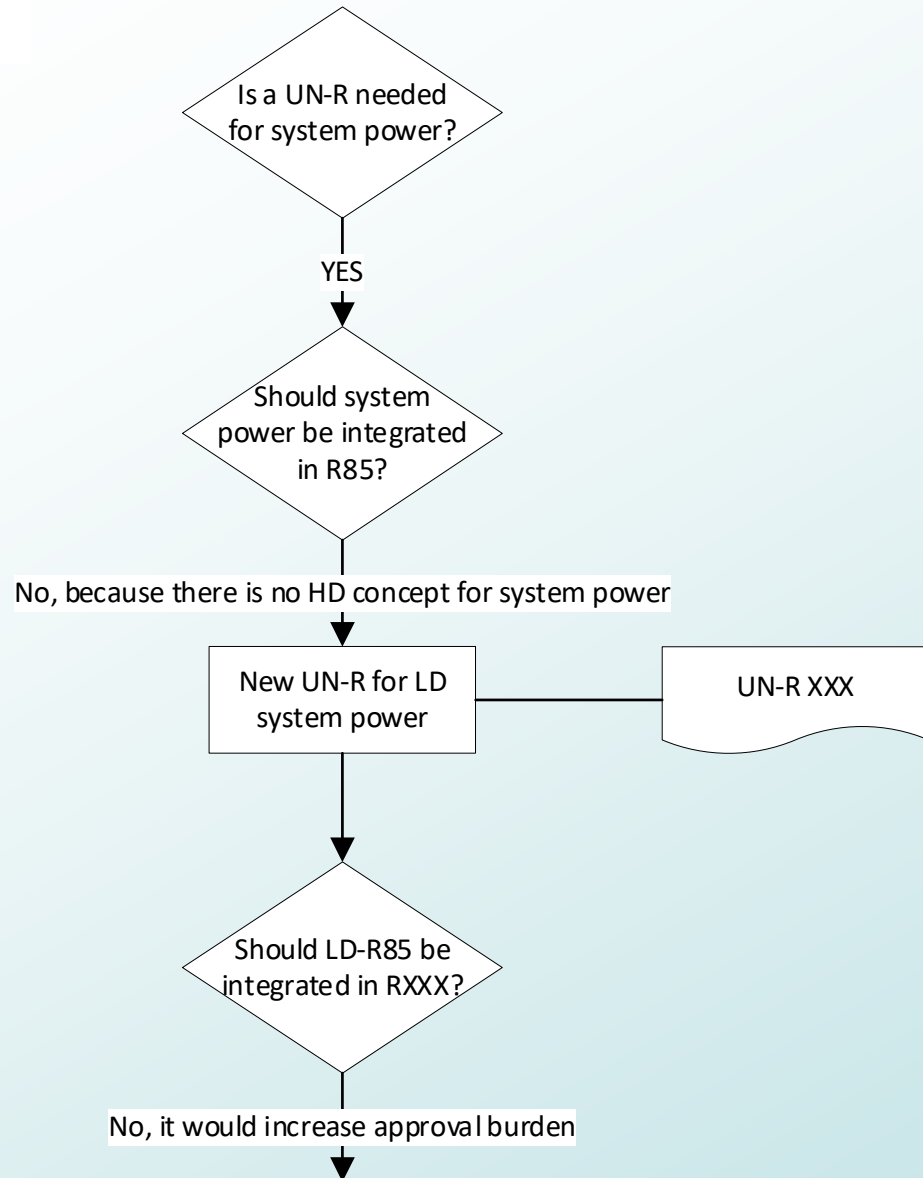
UN-R 85.01 **HD**  
component

UN-R XXX **LD**  
System & component

- 1 Reg for „1 subject“ if the world moves to system power
- New SoA for R85
- E.g. hybrid with 1 ICE and 1 e-motor has 5 approvals



# OICA proposal for GTR21 implementation



In OICA's opinion Scenario 1 (let the scope of UN-R85 as it is and implement the GTR21 in a new UN-RXXX on system power determination) should be followed:

- Less impact on approval burden
- Clear type definition between component based UN-R85 approval and vehicle system approval according to UN-R xxx
- "Easier" drafting of UN-RXXX in comparison with Scenario 2 and 3
- Harmonisation of the both Regulation UN-R85 and UN-RXX remains important



# Scope and purpose of LD power determination

- What is the purpose of propulsion power determination?
  - Safety/environment/customer communication/classification for other regulations
- Comparability vs. Maximum power
  - Comparability: for customer and within industry
  - Comparability among different powertrain concepts
  - What is the definition/common understanding of maximum power?
    - Is maximum power the correct terminology?

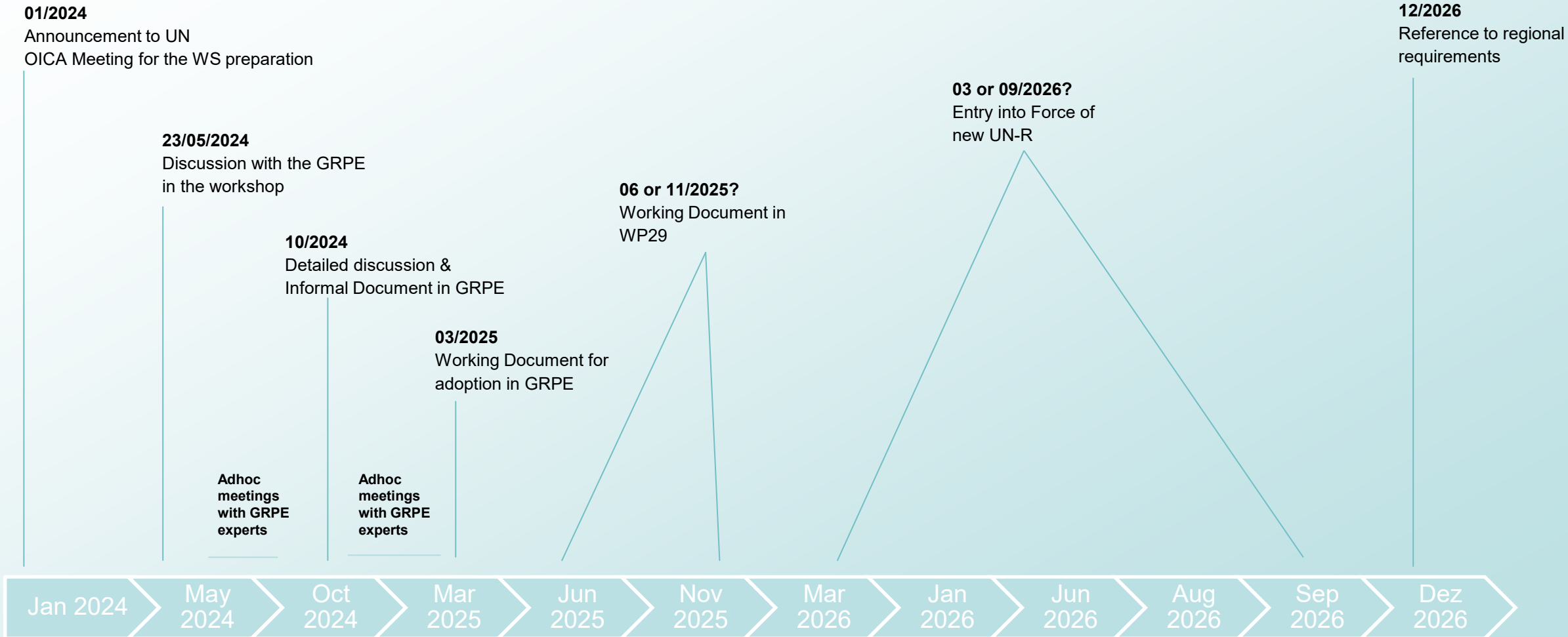
## Differences between the two regulations according to comparability

Topic	UN R85	GTR21
Tested Items	Component	Whole vehicle with multiple propulsion energy converters
Energy supply	Battery supply idealized, supply voltage is kept constant over measurement duration	Vehicle Battery with all their behavior is included
Max power value	Determination of full load curve over speed range	Measurement of one single maximum power value at a certain speed
Measurement duration	Not defined	10 sec. for each measuring point
Determined power values	<ul style="list-style-type: none"><li>• Peak power value (Duration not defined)</li><li>• 30Min. constant power value</li></ul>	<ul style="list-style-type: none"><li>• Peak power value (Highest power over 2sec. Intervals)</li><li>• Sustained power (Average of the 8<sup>th</sup> to 10<sup>th</sup> sec.)</li></ul>





# Roadmap to develop a new UN-R







Thank you very much