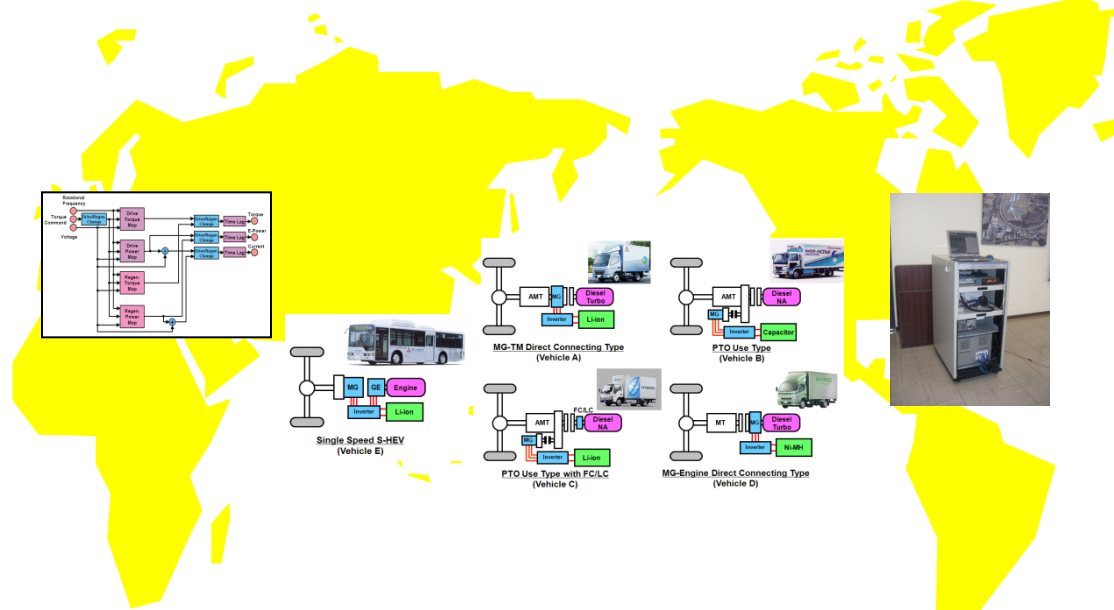




UNITED NATIONS

Working Paper No. **HDH-13-09e**
(13th HDH meeting, 21/22 March 2013)



GRPE Informal Working Group on Heavy Duty Hybrids

13th HDH, Borlänge, 21 to 22 March 2013



Contents

- **Summary of 12th HDH meeting**
- **Status of HDH work program**
- **Roadmap & project planning**
- **Summary of 13th HDH meeting**
- **Next meetings**



Summary of 12th HDH Meeting

- **The results of the 12th meeting in Geneva on 15 January 2013 are summarized, as follows:**
- **Validation test program 1 is on schedule with driver models finished and thermal models nearly completed**
 - **Drive cycle investigations of serial hybrid (task 1) for the different options were presented**
 - **Japan expressed clear preference for the vehicle based approach over the powerpack based HILS approach**
 - **Adaptation of SILS for parallel hybrid (task 2) started in November 2012, proposal for setting up a data bus system as basis for the component library was presented**
 - **OICA proposal to use SILS for validation test program 2 was accepted**
 - **It was agreed that the gtr would require HILS and not permit the use of SILS**
 - **The revised roadmap and project planning on page 5 were agreed**
 - **Establishment of a drafting group was agreed; nomination of experts should be communicated by the end of January 2013**
 - **EU-COM was asked to provide budget for hiring a technical secretary of the drafting group**



Status of HDH Work Program

➤ Validation test program 1

- Validation test program 1 based on SILS (Software-in-the-loop simulation) started in June 2012
- Regular meetings with OEMs are taking place
- Thermal models are available for open source model
- Drive cycle investigations have been completed
- Serial hybrid open source model is uploaded and available for testing
- Model re-structuring and parallel hybrid model are under work

➤ Next steps

- Assessment of chassis dyno and powerpack testing will continue on the basis of input from Contracting Parties by October 2013
- Validation test program 2 with real HVs will start in May 2013
- Development of first gtr draft has started; will be uploaded by end of April



Updated Roadmap & Project Planning

Activity	2 0 1 1				2 0 1 2				2 0 1 3				2 0 1 4																		
	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12
HILS model verification	[Purple bar]				[Purple bar]																										
Component testing verification	[Purple bar]				[Purple bar]																										
Extension to non-electric hybrids	[Purple bar]				[Purple bar]																										
PTO operation	[Purple bar]				[Purple bar]																										
WHVC weighting & scaling factors	[Purple bar]				[Purple bar]																										
Assessment of chassis dyno procedure	[Yellow bar]				[Yellow bar]																										
Assessment of powerpack testing	[Yellow bar]				[Yellow bar]																										
7th meeting				X																											
8th meeting					X																										
9th meeting						X																									
Interim report							[Checkered flag]																								
Validation test program 1																															
10th meeting								X																							
11th meeting										X																					
Validation test program 2																															
Drafting text for gtr n°4																															
12th meeting												X																			
Evaluation & conclusions																															
13th meeting													X																		
Final report																															
14th meeting														X																	
15th meeting																										X					
16th meeting																											X				
GRPE adoption (17th meeting)																											X				
WP.29 adoption																															X

➔ Final report to GRPE delayed to 67th session, GRPE adoption to 68th session

➔ Timing for WP.29 adoption delayed to 164th WP.29 (11/2014)



Summary of 13th HDH Meeting

- **The results of the 13th meeting in Borlänge on 21 and 22 March 2013 are summarized, as follows:**
 - **The basic vehicle cycle will be the WHVC with road gradients; 2 methods for calculating the road gradients will be investigated**
 - **The institutes propose that the model structure allows for using OEM specific models**
 - **The institutes will communicate the deliverables of validation test program 1 and the related time schedule within the next two weeks**
 - **The new model structure will be available by the end of April**
 - **The VECTO transmission model by TU Graz will be added to the open source model**
 - **Master ECU needs to be defined, supportive ECUs via interface or software emulation**
 - **Validation test program 2 will start in May with Volvo parallel hybrid bus, followed by Iveco parallel hybrid MD truck and MAN serial hybrid bus**
 - **Chassis dyno tests and road tests (w/o emissions measurement) will be run at JRC, engine dyno tests at OEM**
 - **Command signal frequency for engine tests will be 1 Hz, 10 Hz, 50 Hz**
 - **OICA and EPA will discuss bilaterally the possibility of HILS testing at EPA and report at the 14th HDH meeting**
 - **Model verification will be investigated during validation test program 2 including powertrain verification**
 - **The hybrid test procedure will be developed as an amendment to gtr n° 4 (new Annex 8)**
 - **Will include HILS method based on JP regulation Kokujikan 281 and input from HDH development**
 - **Will include powertrain method based on US-EPA procedure**



Next Meetings

- **The next HDH meetings are scheduled as follows:**
 - **The 14th meeting will be on 04 June 2013 in Geneva**
 - **The 15th meeting will be on 24 and 25 October 2013 in San Francisco**
 - **The 16th meeting will be in January 2014 in Geneva (to be confirmed)**

- **The next drafting group meetings are scheduled as follows:**
 - **The 2nd meeting will be on 03 June 2013 in Geneva or on 29 May 2013 in Brussels (to be confirmed)**
 - **The 3rd meeting will be decided at 2nd meeting**
 - **The 4th meeting will be on 22 and 23 October 2013 in San Francisco**