WLTP-07-13e

WLTP Coasting (Sailing)

Task Force report, 03June14

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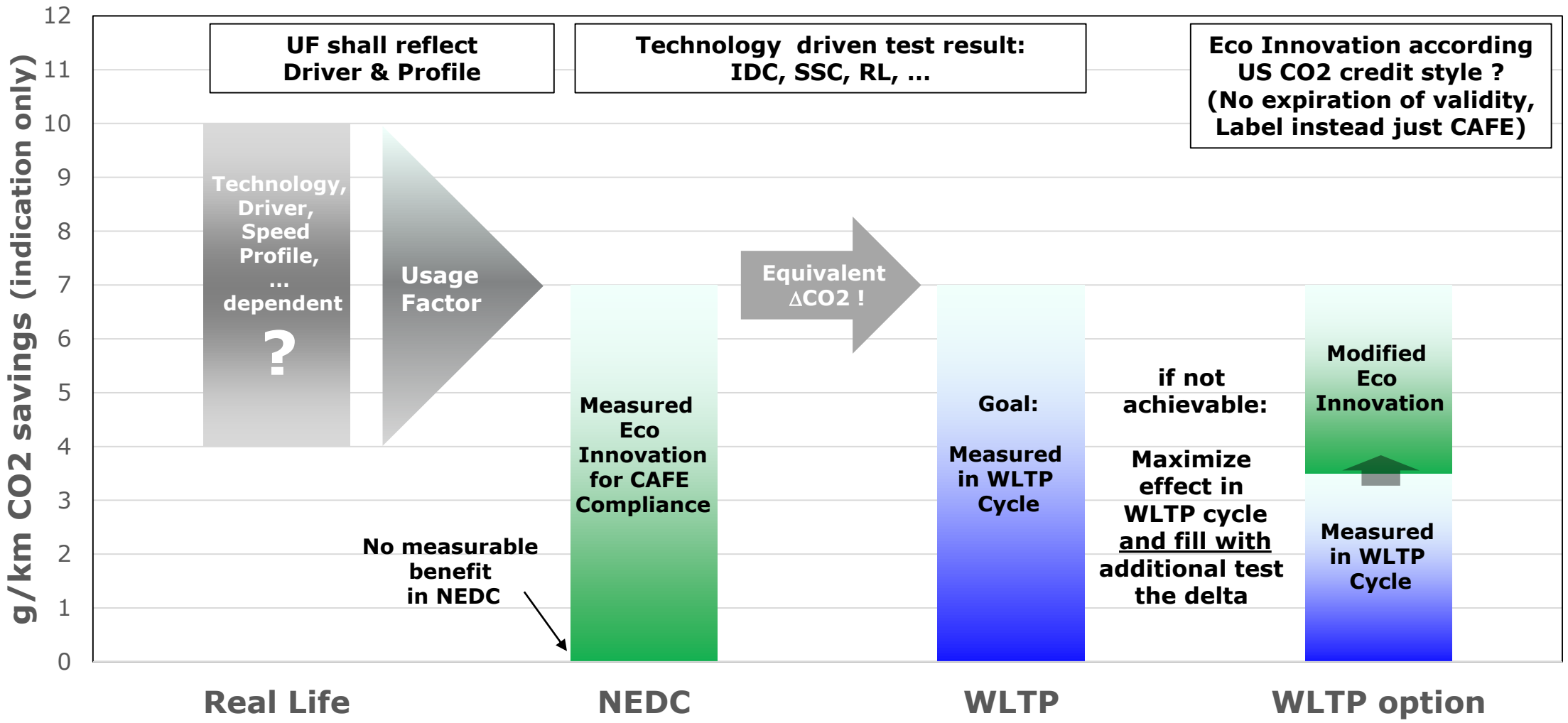
WLTP Coasting

- **One telecom performed, no technical decision made**
- **1 method + baseline reviewed**
- **No MT problems discussed**
- **Naming convention decided: "Sailing" vs. "Coasting":**
  - Carry over definition from Eco innovation team: Use "Coasting" with prefix
  - Two types of coasting are distinguished:
    - ⇨Idle Coasting (IDC)
    - ⇨Start / Stop Coasting (SSC)
- **Next steps until 8th WLTP IWG**
  - Trade and down select methods
  - Directional decision, which method shall be used
  - Interference with "Normalization" task defined

CO2 reduction by Coasting: Transition NEDC ➔ WLTP

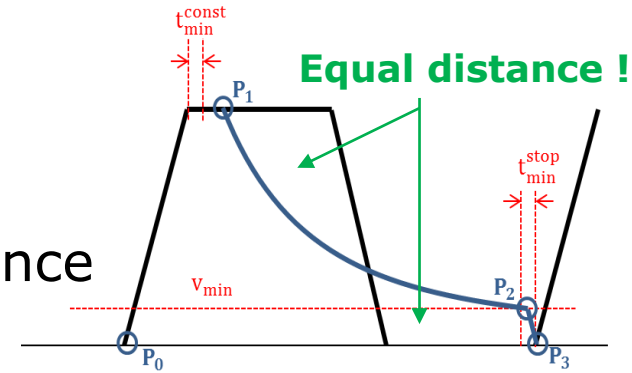


ACEA Expectation: keep Eco innovation CO2 savings (real life + usage factor)

WLTP Coasting Status

- **Baseline & 1 Proposal reviewed: (both require a usage factor)**
  - NEDC Eco Innovation approach
    - ⇨Based on NEDC cycle modification
    - ⇨Cycle modification procedure based on equal distance

Adobe Acrobat Document



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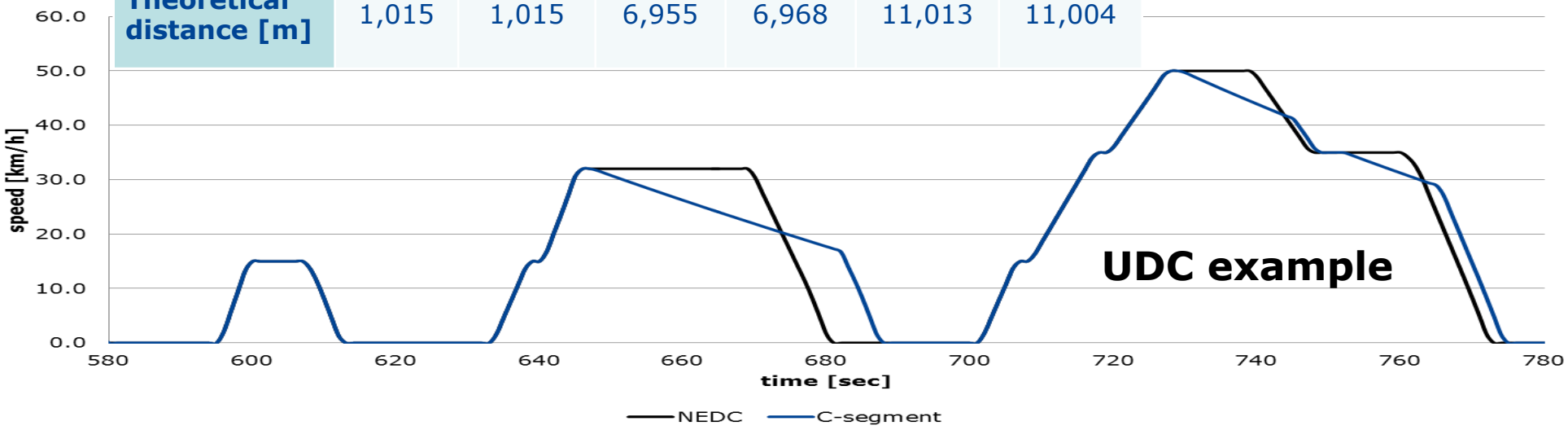
  - Bosch WLTP Coasting approach
    - ⇨Account low power phases in test cycle with zero/idle consumption!

Measuring the benefit of coasting

Modifying the NEDC: Results (JRC evaluation)

	Comparison between the parameters of mNEDC and NEDC for a C-segment vehicle					
	Elementary Urban cycle		Extra-urban cycle		Total cycle	
Speed profile	NEDC	mNEDC	NEDC	mNEDC	NEDC	mNEDC
Time [s]	195	195	400	400	1180	1180
Theoretical distance [m]	1,015	1,015	6,955	6,968	11,013	11,004



Joint Research Centre

Measuring the benefit of coasting

Modifying the NEDC

How define the Usage Factor?

The UF calculated as distance share of usage in normal operation conditions

	Fuel efficiency or CO_2 savings	Coasting Time share in RW	Coasting Distance share in RW	Coasting Time share in mNEDC	Coasting Distance share in mNEDC
Results	5-10%	20-35%	25-35%	JRC evaluation 25-30%	JRC evaluation 30-35%

BOSCH proposal: General outline

Idea:

- Coasting occurs whenever power demand to ICE is low!
- Account low power phases in test cycle with zero/idle consumption!

➔ Using same measurement of the vehicle on dyno according WLTP type approval testing conditions
  - Time resolved recording of fuel consumption necessary

➔ Identify phases with low engine power demands using a power threshold & mark these phases as Coasting phases.

➔ Choose the power threshold so that Coasting time share in cycle matches average Coasting time chare in real life .

➔ Subtract respective zero/idle fuel consumption for identified Coasting phases from the original fuel consumption

Bosch proposal

Pros:

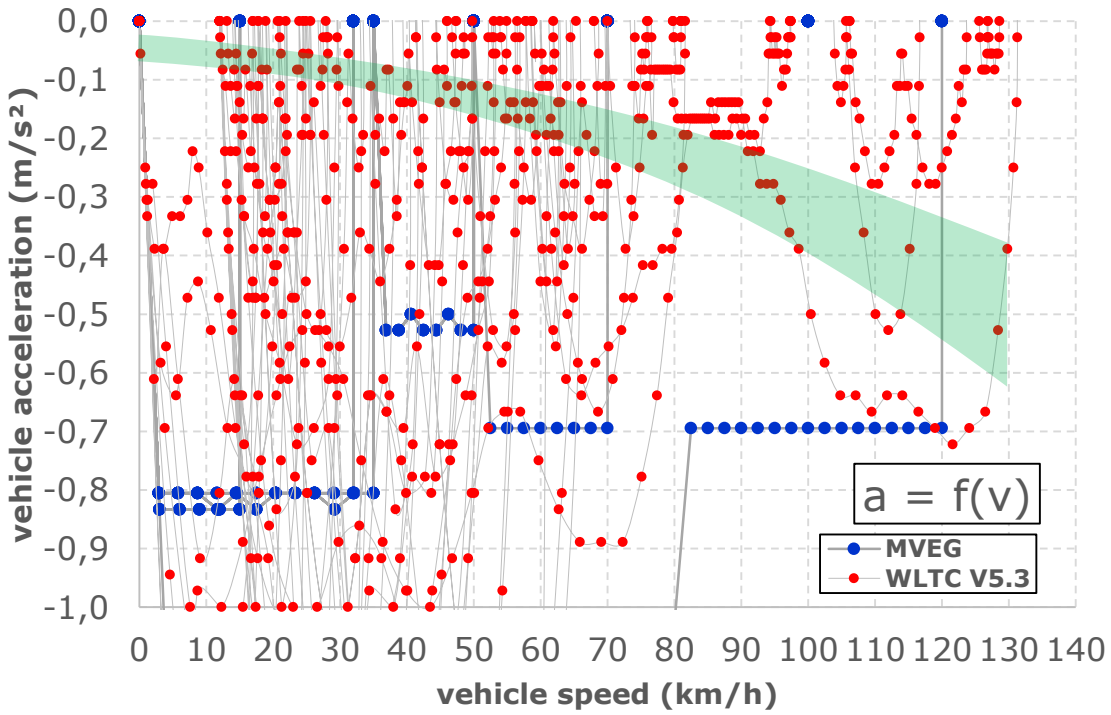
- Simple and easy to implement, no cycle change
- Adjustable by means of a usage factor (% of time)
- No double testing required (evtl. idle consumption)
- Sensitive on remaining idle power (or stop/start)
- Reduction of engine low power operation physically correct

Cons:

- CO_2 modal analysis measurement required
- Energy saving over time not represented correct, just accumulated energy saving reasonable

WLTP coasting based on cycle modification

No Coasting opportunity designed into NEDC nor WLTP at typical coast lines



Modification of WLTP within tolerance bandwidth: 22% of time, same distance