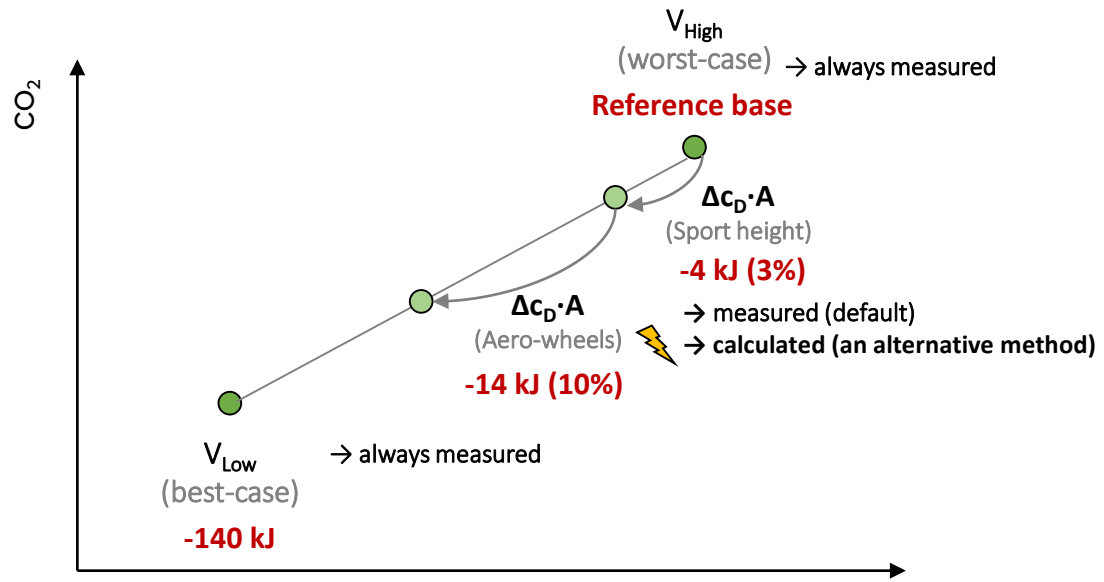
PREMISSES FOR AN ALTERNATIVE METHOD

EXAMPLE

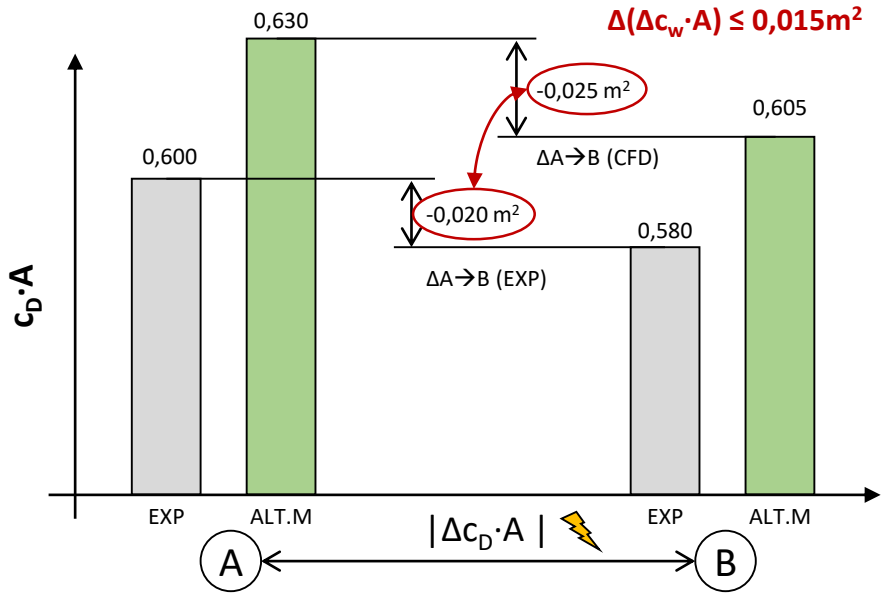
A. No interpolation:	worst-case	$c_D \cdot A$	is always measured
B. Inteprolation:	worst-case, best-case	$c_D \cdot A$	is always measured
	individual vehicle - equipment	$\Delta c_D \cdot A$	can be measured (default)
			can be calculated (an alternative method, eg. CFD)

INTERPOLATION



Typical values of CED for a compact class car

AN ALTERNATIVE METHOD PRECISION



Accuracy criteria for an alternative method in WLTP → Applies for rating an equipment with cca. 0-10% effect on CED between V_L & V_H

Application of an alternative method:

1. Makes the type-approval process significantly more effective; highly variable equipment can be calculated and not measured
2. Has a relatively marginal effect on the whole car; V_L & V_H measured; aero-effect of a single equipment cca. 0-10% of $\Delta CED_{L \to H}$

OEM = manufacturer
TS = technical service
TAA = type approval authority

CERTIFICATION PROCESS OF AN ALTERNATIVE METHOD

PROPOSAL

1. SCOPE DECLARATION

1.Body types
2.Groups of types of parts
3.Number of test-cases

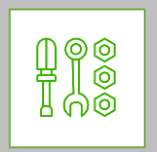
Responsibility: OEM
Approval: TS/TAA

2. TEST-CASE DEFINITION

1.Baseline model
2.List of modifications (deltas)

Responsibility: OEM
Approval: TS/TAA

3. SPECIFICATION OF TOOLS



1.Type and set of parameters
! if changed -> re-certification !

Responsibility: OEM
Approval: TS/TAA

4.A MEASUREMENT IN WIND-TUNNEL

4.B ALTERNATIVE METHOD

1.Result protocols
2.List of parameters and input data (4.B)

Responsibility: OEM
Witness: TS/TAA

5. EVALUATION AND REPORT

1.Certification report
2.Each case to meet condition Err. ≤0,015m²

Responsibility: OEM
Approval: TS/TAA

6.A CERTIFICATION PASSED

1.Approved certification report (6.A)

Responsibility: TS/TAA

6.B CERTIFICATION FAILED

REVISION

ALT. METHOD CERTIFICATE

Motivation:
Check of an input method

Expectation:
The same results for the same inputs within proposed tolerance

1. CONFORMITY CHECK OF 4.B

1.List of parameters and input data by TS/TAA

Responsibility: OEM
Witness: TS/TAA

2. EVALUATION AND REPORT

1.Test report
2.Deltas to be within proposed tolerance (±0,002m²)

Responsibility: OEM
Approval: TS/TAA

REVISION

ROAD LOADS (f0, f1, f2)

Motivation:
Check of declared values of the whole individual car

Expectation:
Conformity of road loads within specified tolerance

1. COAST-DOWN TEST

1.Individual car and declared road loads specified by TS/TAA

Responsibility: OEM
Witness: TS/TAA

2. EVALUATION AND REPORT

1.Test report
2.Cycle energy to be within specified tolerance (±5%)

Responsibility: OEM
Approval: TS/TAA