Energy optimisation **of a chassis dynamometer.**

As close to reality as possible.

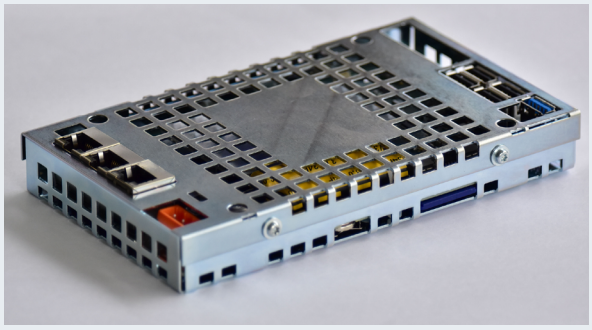
Dynamometers for emissions measurements are at the heart of modern vehicle development. With the aim of accurately simulating real-world driving conditions in the laboratory whilst precisely measuring emissions, fuel consumption and drive behaviour, vehicles are run on large, highly dynamic rollers. Sophisticated measurement systems record relevant exhaust gas and performance data – in a reproducible, controlled manner and independent of external influences.

Optimising energy consumption without compromising on measurement quality.

Simulating different driving situations – such as acceleration, load changes or driving uphill – requires large amounts of energy on a continuous basis. To achieve this, powerful motors, brakes and precise control systems must operate continuously. The sensor technology, measurement systems and safety monitors operate continuously at a high level to ensure stable conditions and accurate measurement values.

Leverage for energy optimisation.

Energy optimisation of a dyno test bench aims to reduce overall energy consumption during the test process without compromising measurement quality. This includes more efficient motors, intelligent control and load management as well as optimised operating and standby modes. Through better coordination of all components and the economical use of auxiliary and ancillary units, energy requirements can be significantly reduced and the test bench will be operated in a more sustainable manner overall.

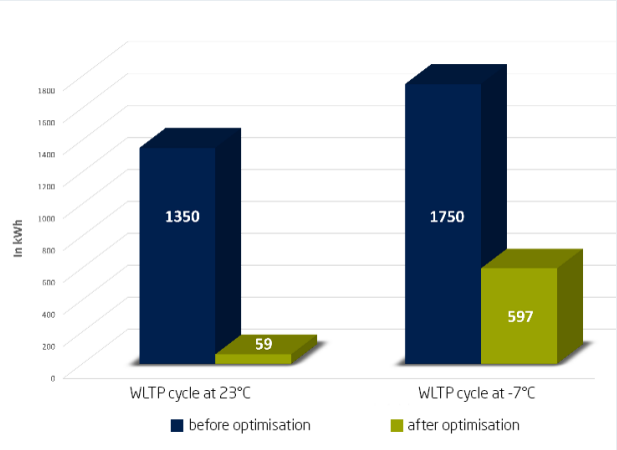


Figures that speak for themselves.

Optimisations resulting in significant energy savings whilst maintaining the same performance.

To assess the energy efficiency of the dynamometer, electricity consumption was analysed during a WLTP test cycle with 12 hours of conditioning and a subsequent WLTP driving cycle - both before and after the energy optimisation measures were implemented.

The graph and tables show a direct comparison of the electrical energy required in kWh and illustrate the savings achieved by the optimisation measures.



Comparison of consumption for both driving cycles during conditioning

Operating hours	before optimisation	after optimisation	Savings after optimisation		
in h	in kWh	in kWh	kWh total	in %	in €
1*1	108	3	105	97,22	24,15
3*1	321	8	313	97,51	71,89
6*1	640	17	623	97,34	143,32
12*1	1.280	34	1.246	97,34	286,58
12-12,5*2	1.350	59	1.291	95,63	296,93

Measured power consumption (WLTP, 23°C, SOAK mode) // Example: €0.23 / kWh

Operating hours	before optimisation	after optimisation	Savings after optimisation		
in h	in kWh	in kWh	kWh total	in %	in €
1*1	142	48	94	66,20	21,62
3*1	422	142	280	66,35	64,40
6*1	842	283	559	66,39	128,57
12*1	1.681	566	1.115	66,33	256,45
12-12,5*2	1.750	597	1.153	66,89	265,19

Measured power consumption (WLTP, -7°C, SOAK mode) // Example: €0.23 / kWh

*1 = WLTP conditioning mode

*2 = WLTP driving cycle

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