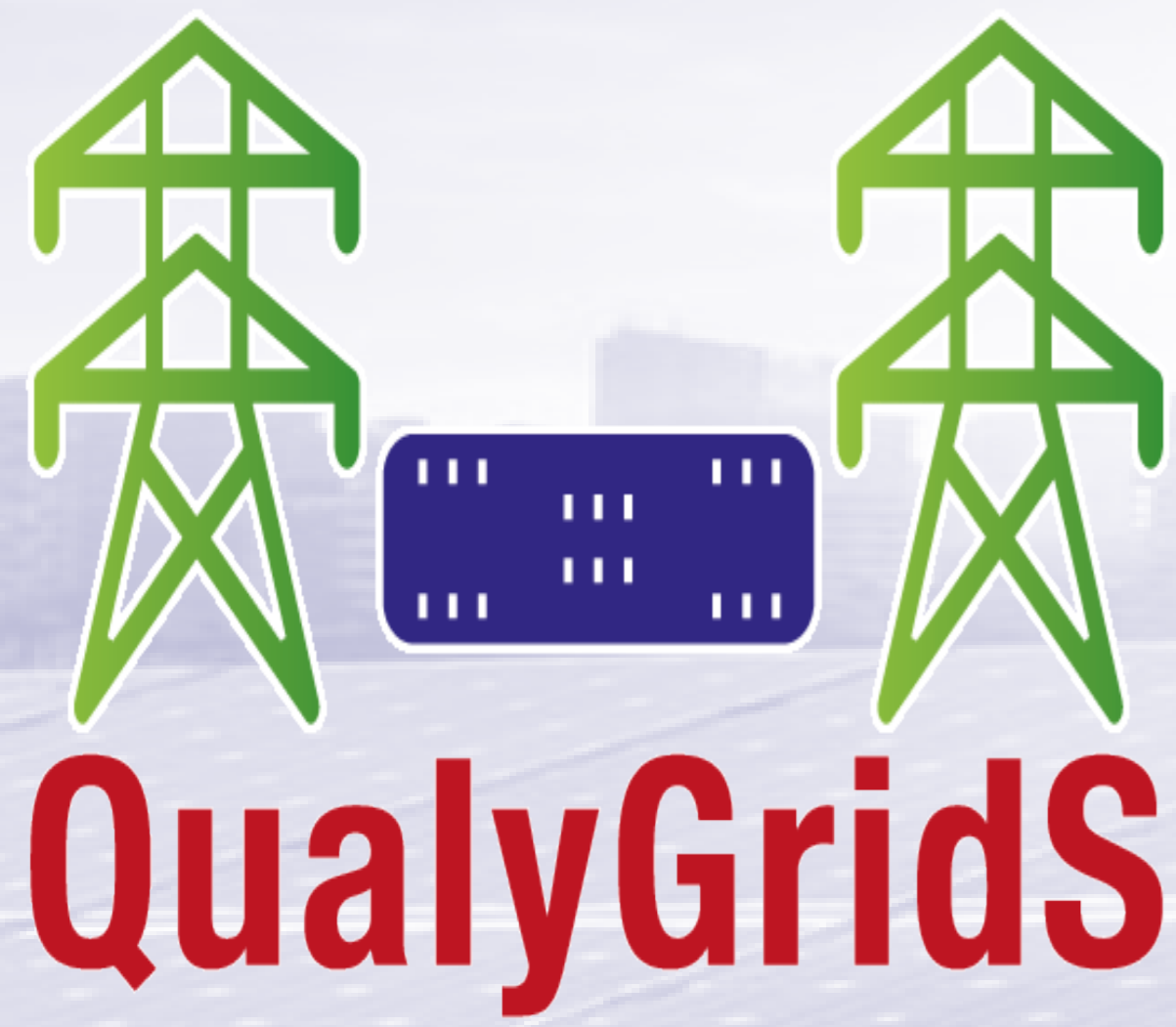


QualyGridS - Standardized qualifying tests of electrolyzers for grid services

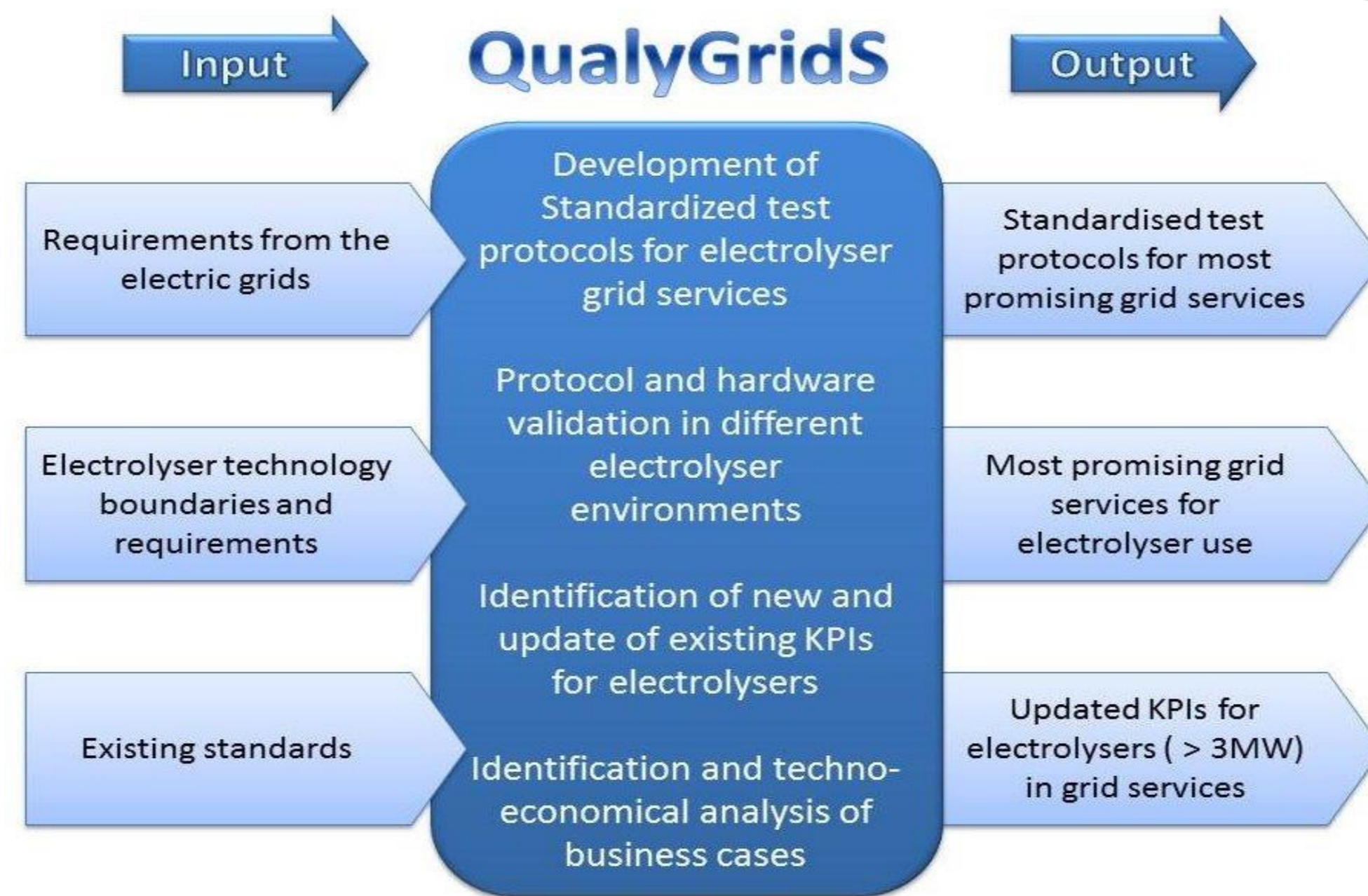


Regine Reissner ⁽¹⁾, Marius Bornstein ⁽²⁾, Ben Green ⁽³⁾, Laura Abadía ⁽⁴⁾, Cyril Bourasseau ⁽⁵⁾, Shi You ⁽⁶⁾, Chresten Træholt ⁽⁶⁾, Françoise de Jong ⁽⁷⁾, Pablo Marcuello ⁽⁸⁾, Christoph Imboden ⁽⁹⁾, M. Spirig ⁽¹⁰⁾ et al.

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Motivation

The objective of the project QualyGridS is to develop testing protocols for water electrolyser systems performing electricity grid services. The methodology of the project is shown in Figure 1.



Appeal

Collaboration of QualyGridS with other projects, manufacturers and users of electrolyser systems is highly appreciated to have a broad base of feedback on the suggested electrolyser tests. Anybody interested should please get in contact with the coordinator of the project: Regine Reissner (regine.reissner@dlr.de)

Methods and Results

First step: collecting electricity grid services and prequalification procedures

Second step: draft of unified testing protocols and pass criteria
Various (European) countries

Next steps:

- Verification in alkaline and PEM electrolyzers and review

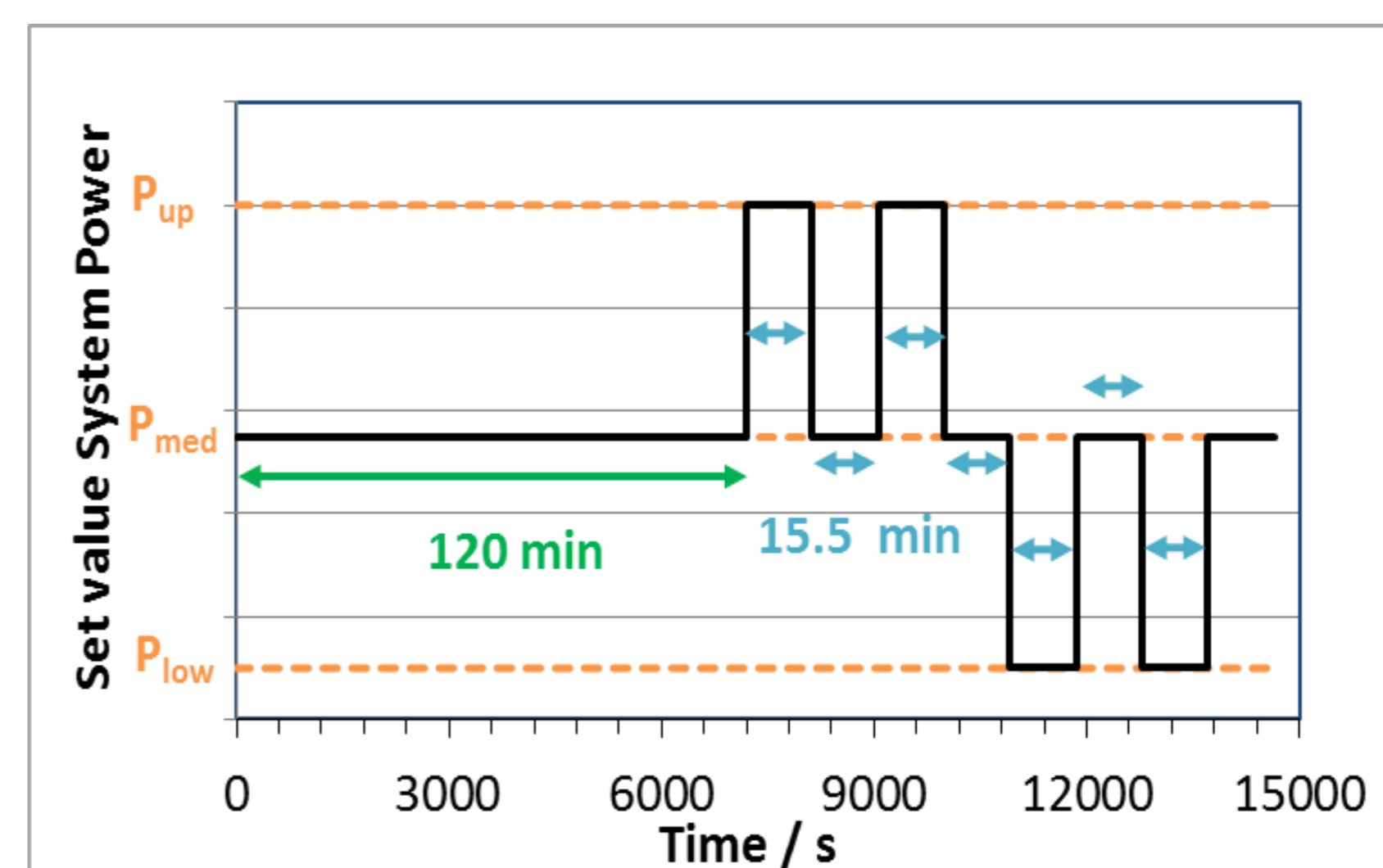
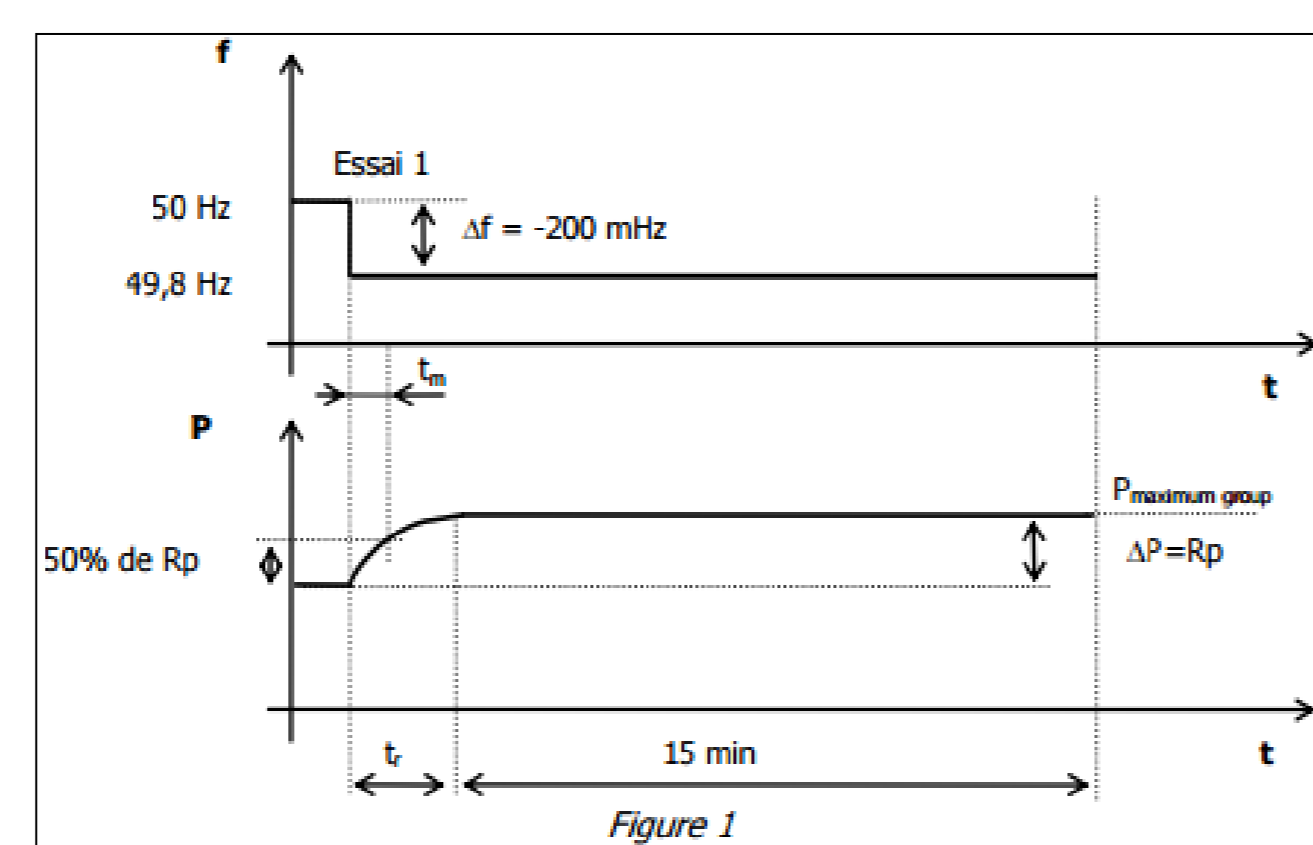
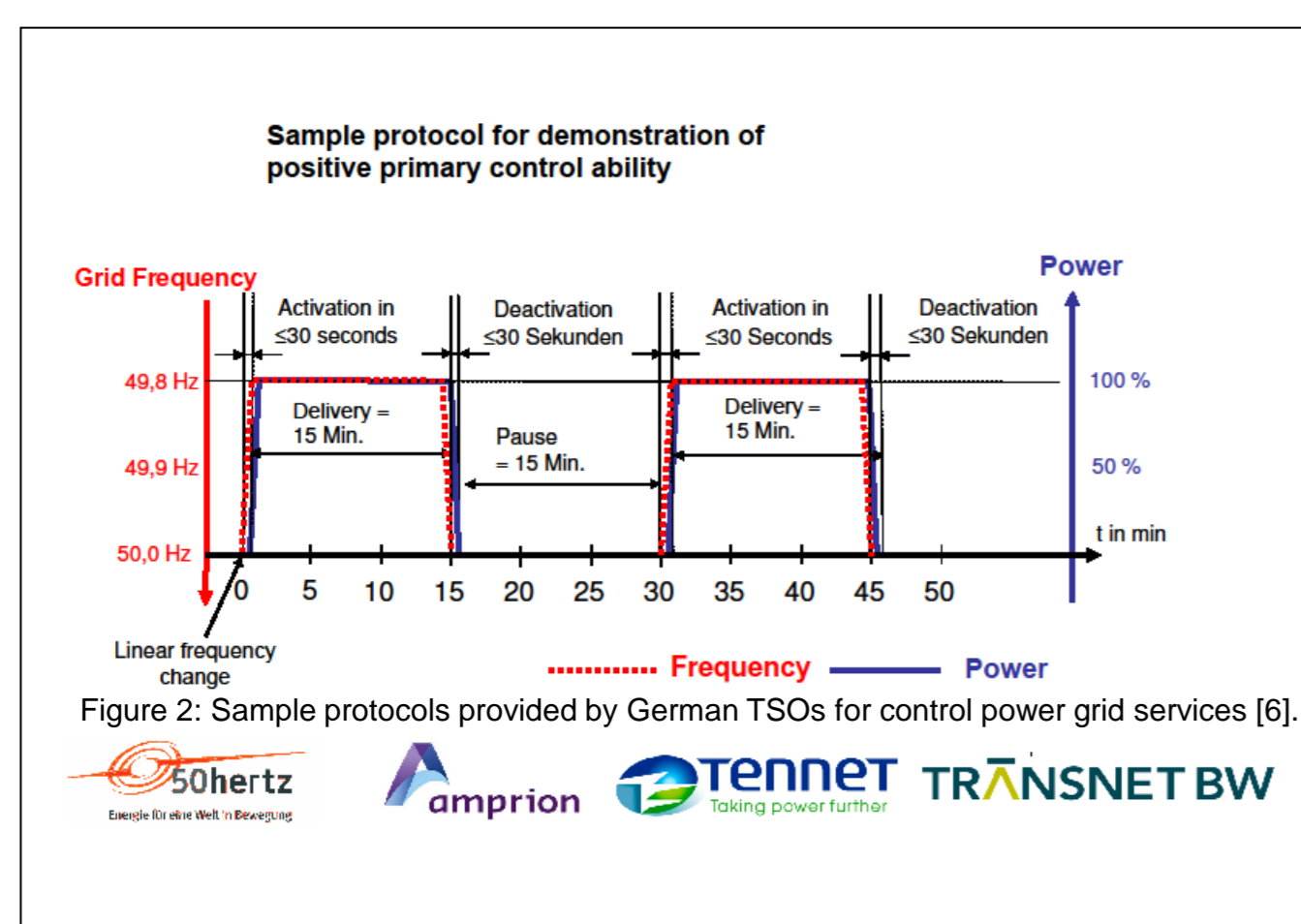
Examples:

Variation of tests for similar product, variation of defining the “pass” criterion

Germany Primary Control Reserve [1]

France Frequency Control Reserve [2]

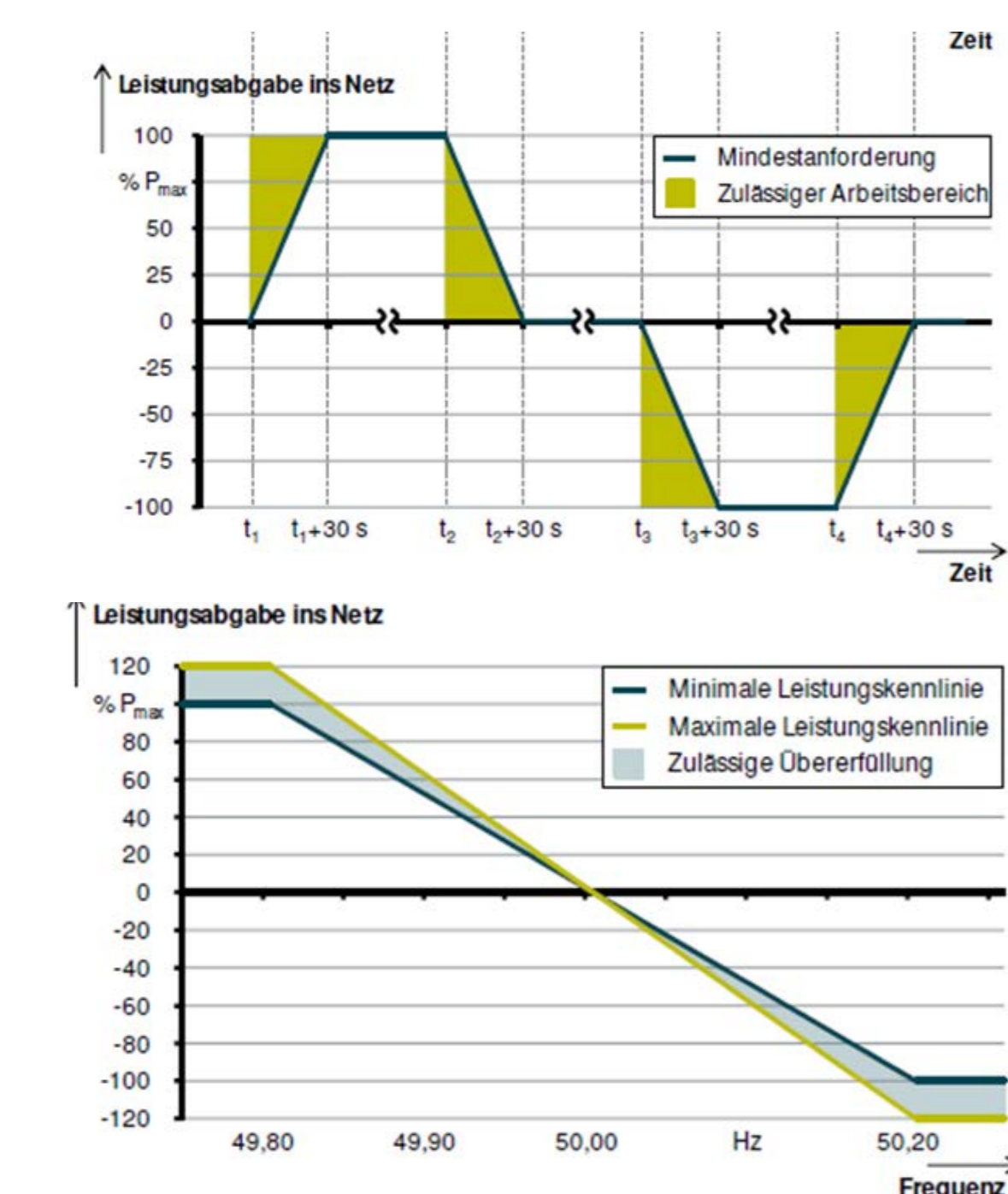
Draft Testing Protocol



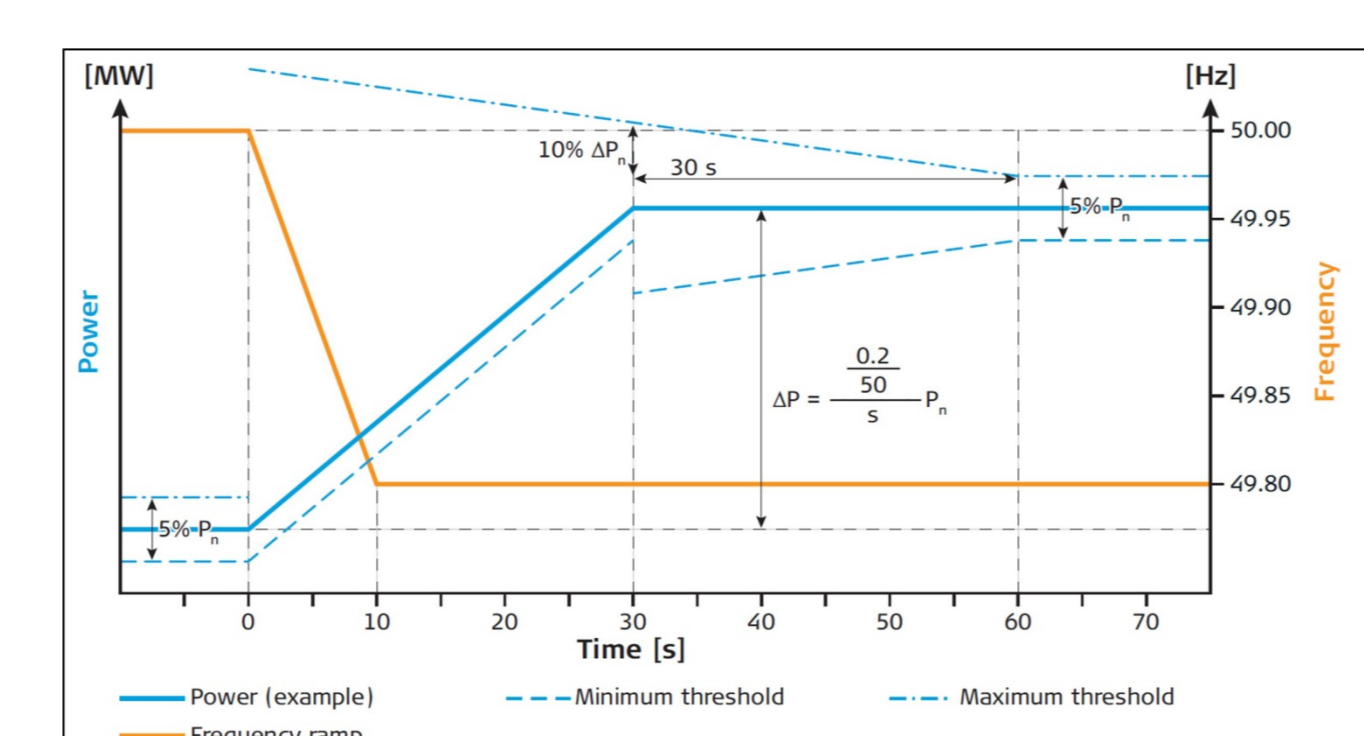
- Compliance criteria:
- Non oscillating waveform response
 - Time $t_r < 30$ sec
 - Time $t_m < 10$ sec
 - The variation $\Delta P = R_p$ maintained for 15 min (after t_r)
- (There are more tests)

Pass criteria KPIs:

Ramp duration	t_m	≤ 15 sec
Stability	t_{full}	≤ 30 sec
Initial response time	t_{init}	$\leq 0.05 (P_{med} - P_{low})$
		≤ 1.5 sec



Switzerland Primary Frequency Control [3]



References

Further information: Project QualyGridS www.QualyGridS.eu; [1] www.regelleistung.net; [2] RTE, “Documentation Technique de Référence Chapitre 8 – Trames type”, V3, 2014. [3] Swiss Grid, “Test for secondary control capability”, 2012, Apr. V2.1. https://www.swissgrid.ch/dam/swissgrid/experts/ancillary_services/prequalification/D130422_Test-for-secondary-control-capability_V2R1_EN.pdf

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