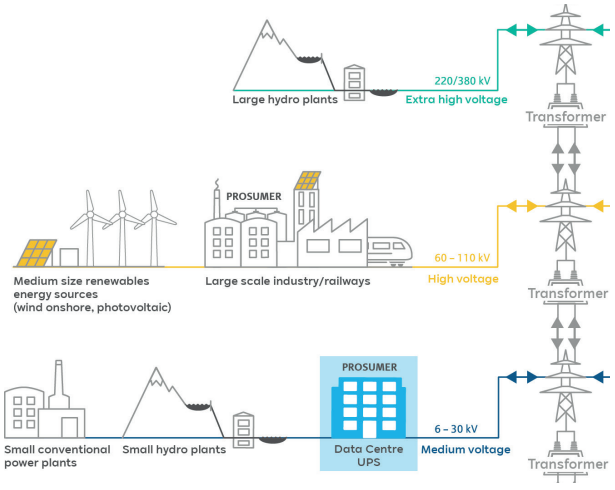
Master+

Data Centres as Partners of the Energy Transition

Innovative UPS-Battery-System for the Energy Transition

Make your Data Centre a Partner of the Energy Transition with our innovative UPS-Battery-System Master+ and profit from the opportunities in the energy markets.

With Master+ you can transform your Data Centre into an energy hub in the electric power system by using a separated part of the UPS battery to support a stable and reliable grid operation.



Benefits for Data Centres

- Contribution to the Energy Transition by providing stability to the electricity grid
- Highly-efficient UPS-Battery-System providing security-of-supply & grid services
- Higher reliability than conventional UPS solutions
- Substantial cost reduction through income from the energy markets
- Extended warranty on main system components

RWE

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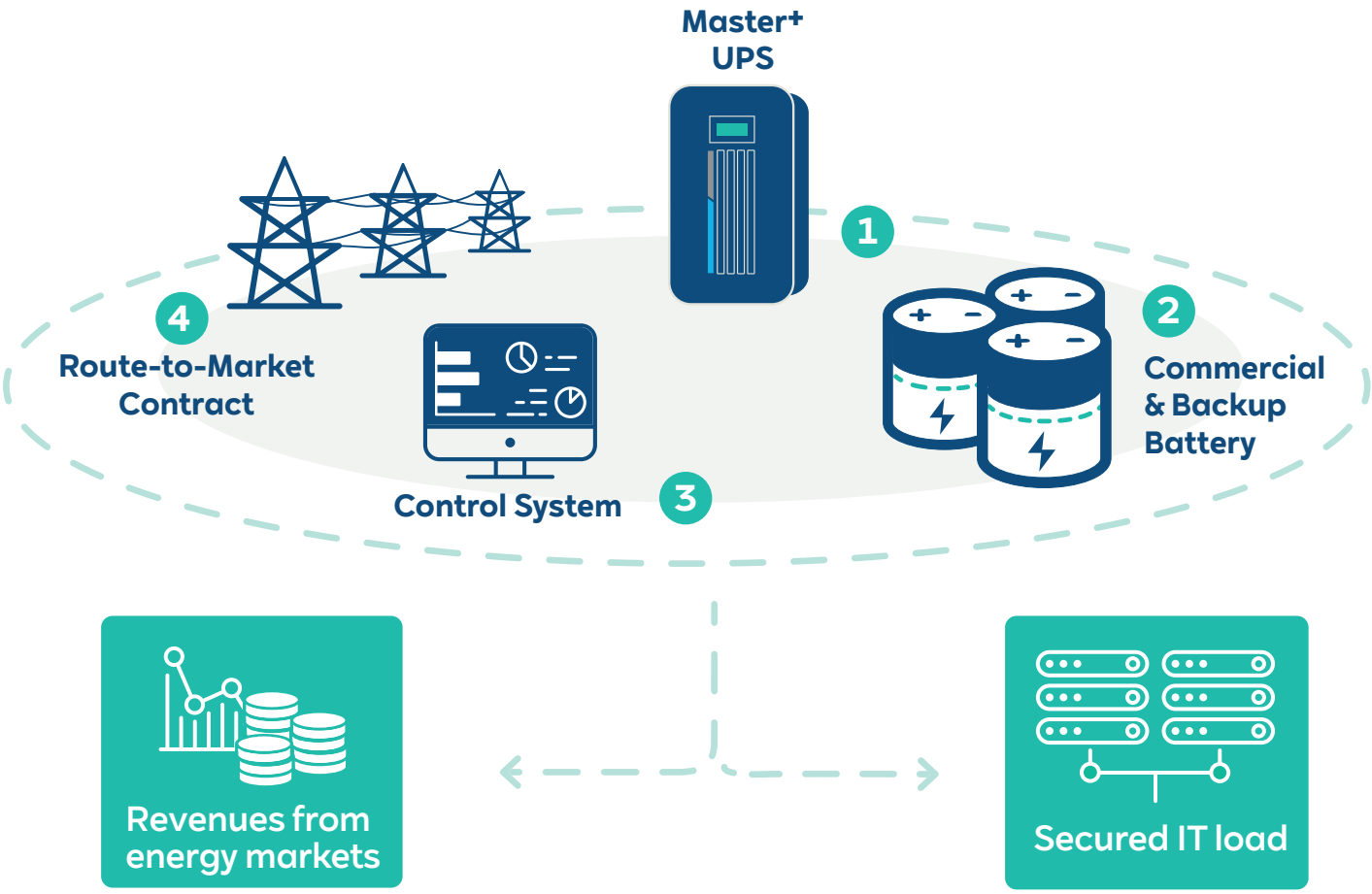
Master+ : A holistic solution that creates synergies



Master+ Solution Components

Master+ consists of four components whose interaction generates technical and economic advantages for Data Centres.

1 Highly efficient UPS with energy commercialization capabilities.

- Smart Grid Ready
- Rectifier IGBT based technology
- Galvanic isolation
- Extended Warranty

2 Cycle proof premium lead acid battery[1] specially designed for both security-of-supply and grid service applications.

- Includes battery monitoring system
- Space saving compact arrangement
- Larger capacity than conventional UPS batteries
- Typically extended backup time
- Extended Warranty

[1]) Lithium-ion battery solution in development

3 Integrated control system ensures system reliability while monetizing solution in energy markets.

- It virtually splits the battery into a backup and a commercial segment
- Backup segment is always preserved for security-of-supply
- Commercial segment is used for grid services
- High IT security design

4 Route-to-Market Contract to profit from energy markets.

- Frequency Response as a Service
- Additional income streams available[2]
- Overall energy market risk taken by RWE

[2]) Country dependent

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Reduce costs

Master+ helps Data Centres to reduce costs by participating in the energy markets without taking any energy market risk:

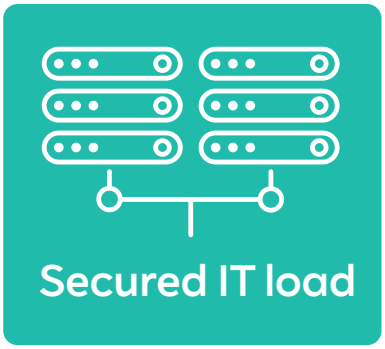
- **RWE creates additional value by bringing the commercial segment of the battery into the energy markets at no energy market risk for the Data Centre**
- **Data Centre benefits from significant lower CAPEX than conventional UPS solutions through RWE contribution to UPS battery cost**
- **In return Data Centre grants RWE usage right for commercial segment of the battery**

Increase reliability

The use of the UPS batteries to stabilize the power grid has no negative impact on the reliability of the overall system.

On the contrary, reliability and service life of the security-of-supply of your IT Load increases due to:

- **Cycle proof premium lead acid battery from established producers with typically an extended backup time. Up to 30 minutes depending on design**
- **Battery Monitoring System that allows real-time monitoring for predictive maintenance**
- **5 year full warranty [3)]**
- **5 year warranty on UPS**



[3)] Maintenance Contract mandatory

Awards

eco:// award 2019 WINNER 2019

Winner in the category Datacenter Infrastructure

DEUTSCHER RECHENZENTRUMSPREIS 2018

Winner in the category Energy Technology

Further information can be found here

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EKu.LOC

Master+ Reference Project

A Master+ commercial facility is located at EKu.Loc*, a new data centre commissioned in December 2019 in the Ruhr Area in Germany.

2 x 250 kW Master+ UPS

2 x 240 600 Ah; 2 x 288 kWh nominal;
Rack size (L x W x H) 2 x 3018 x 662 x 2107 in mm

Master+ allows EKu.Loc to contribute to the energy transition by helping balancing the power grid through the delivery of ancillary services. Furthermore, Master+ helps EKu.Loc to save costs while increasing system reliability due to its 24/7 monitored cycle proof premium batteries.

EKu.Loc's emergency power supply system consist of 2 x 250 kW Master+ UPS with two battery strings, each with 240 high energy density cells with a capacity of 600 Ah. It also features a 1.1 MW emergency generator.

EKu.Loc foresees a capacity expansion until 2024 of up to 8 x 250 kW UPS and an additional power generator. TÜViT TSI.Standard incl. DIN EN 50600 certification is in preparation.

"With Master+ we have a larger storage capacity and our battery is monitored around the clock. This increases our security of supply while at the same time reducing our costs."
Dr. Burkhard Holl, Head of Technology and Operations at KSG

*Eku.Loc is a data center of the KSG Kraftwerks-Simulator-Gesellschaft mbH

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RWE

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