Workshop on electrified public transport bus systems

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Further Electrification of Urban Public Transport

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Verband Deutscher Verkehrsunternehmen

Initiatives on Electrification of (Public) Transport at EU level

- EU Transport Whitepaper, targets: no conventionally fuelled “cars“ in urban areas by 2050, 50 % by 2030
- Various strategic documents and initiatives on alternative fuels
  - ➔ Expected initiative on “clean transport systems“
  - ➔ Initiatives on hydrogen used in transport
- UITP: decarbonisation conference February 2012, EBSF activities
- ERTRAC roadmap on EBSF: includes recommendations on further development of electrification of bus systems
- Current EU-funded project on hybrid buses (HCV)
- Coming FP7 call on electrification of bus systems

UITP EUROPEAN UNION

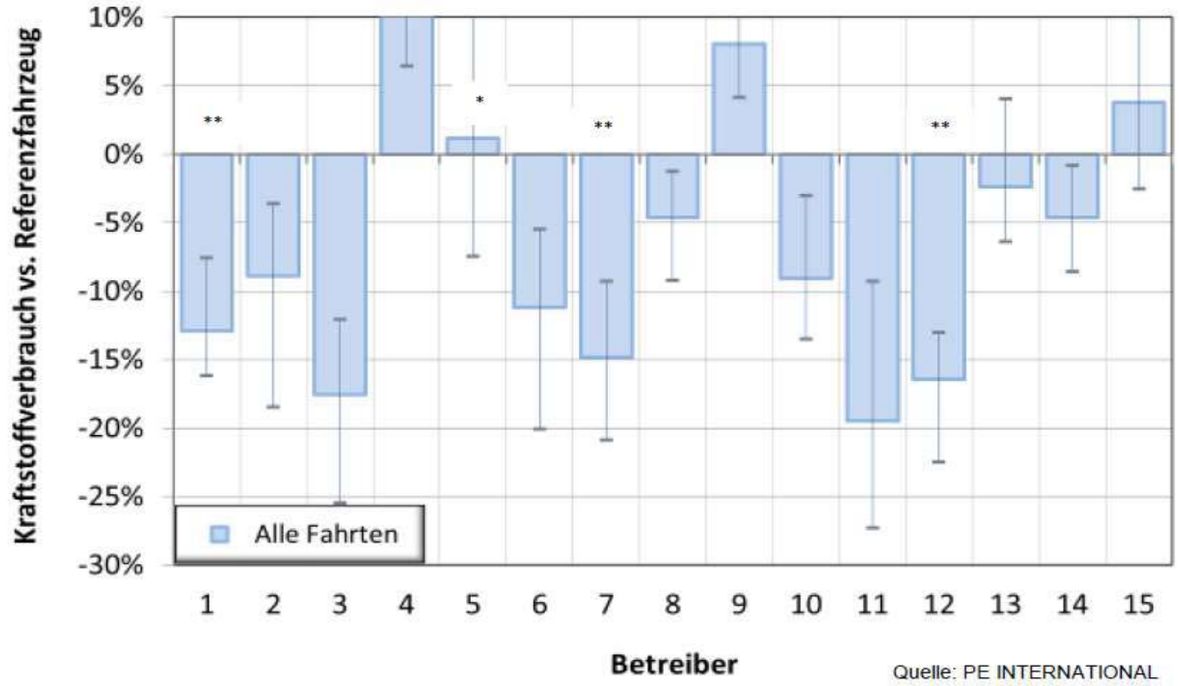
Verband Deutscher Verkehrsunternehmen

Various National Initiatives on Electrification of (Public) Transport

- Germany: Electromobility programme of German government with regional showcases („Schaufenster Elektromobilität“
  - ➔ various public transport showcases have been funded in first funding period and are now included in new proposals
  - ➔ VDV is closely involved and has organised the third annual conference on electric buses in February 2012, fourth conference is planned already for Februar 2013
  - ➔ E-Bus Award 2012 organised by VDV, supported by German Transport Minister Dr. Ramsauer http://87.230.1.165/index.html
- Netherlands: Zero Emissie Busvervoer initiative
- Various projects in other countries/European cities

HYBRID BUSES: PARTIALLY ELECTRIC OPERATION - With increasingly available experiences

Different fuel savings depending on technology, operational conditions etc.



Quelle: PE INTERNATIONAL

* Mehrverbrauch ergibt sich aus unterschiedlichen Faktoren (z.B. Betriebsmanagement, Klimatisierung, Routencharakterisitk, eingeschränkte Vergleichbarkeit Fahrzeuge, z.B. Klimatisierung); an Reduktion wird aktuell gearbeitet

** nur Fahrantriebverbrauch

Independent institutes and Real traffic data

Customer field test and traffic data Reported by Customers and Public Authorities

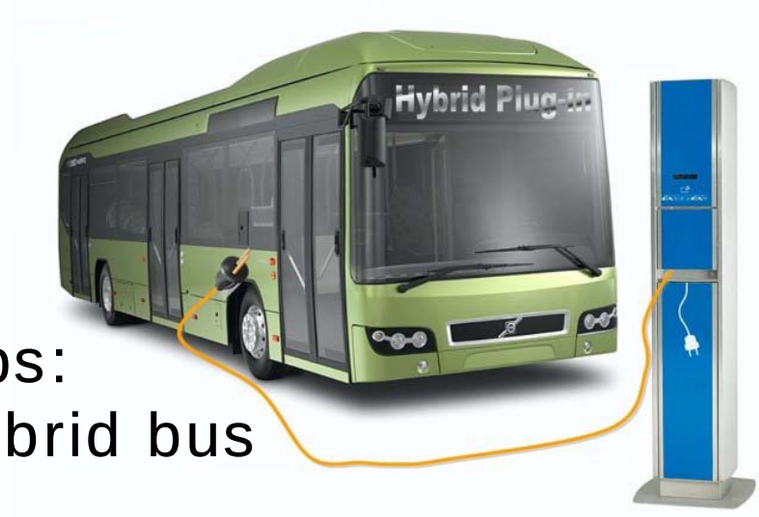
	7700 Hybrid litre / 100 km	7700 Diesel litre / 100 km	Saving %
Göteborg – Daily operation	25	40	31%
London - Route 159**	35	54	35.5%
London - Route 141 fleet	38	68	35.5%
Switzerland (hilly)	54	76	29%
STIB Brussels 17 km/h	33	61	45%
Switzerland (flat)	23	35*	34%
Fraunhofer- Avg. 7 routes	32	47*	31%
La Rochelle - Commuter	26	43*	38%
La Rochelle - City	30	54*	43%
Luxemburg 31 km/h	22	37*	40%

* Competitor bus used as reference

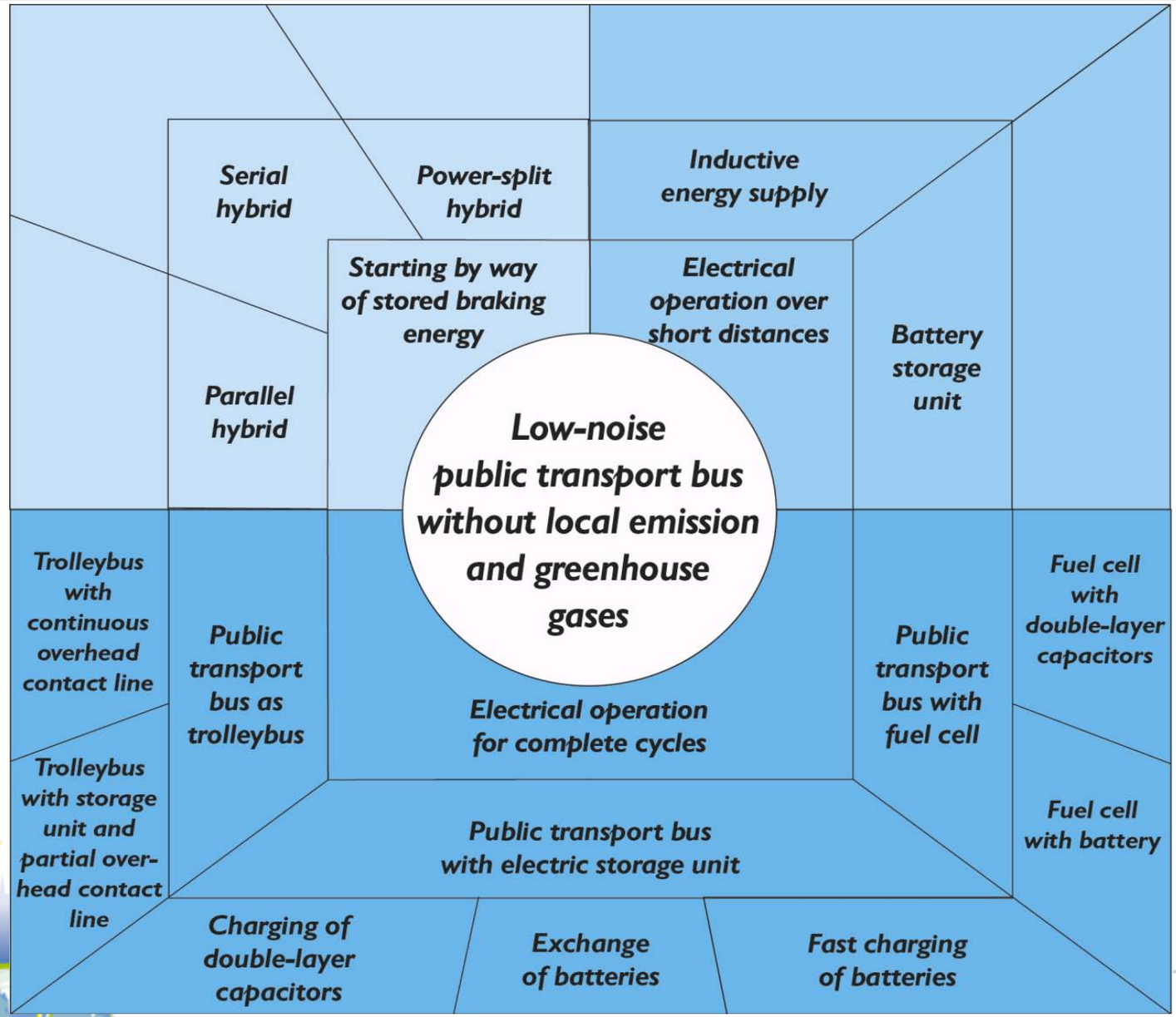
** Chassis dynamometer test at Millbrook, UK

Conclusion La Rochelle testing: *Announced energy and environmental gains are confirmed: the vehicle consumes 38 to 44% less fuel than standard*

Next steps: plugin hybrid bus



Operation towards fully electrified public transport buses



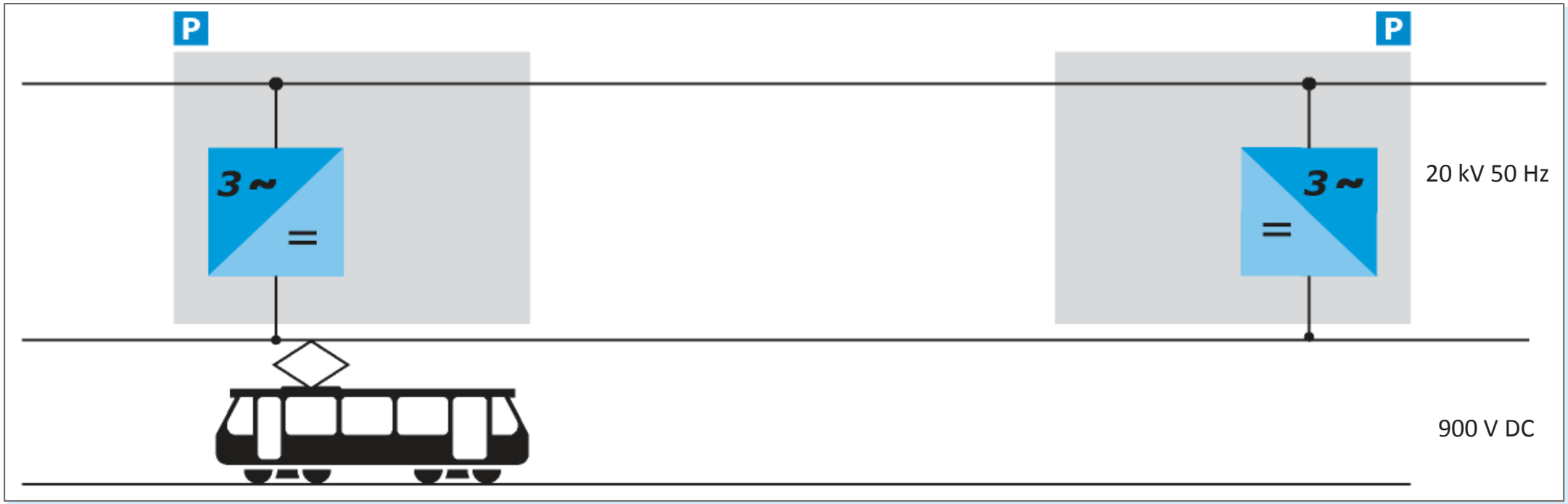
→ EBSF bus electrification study: complete cycles

Further Development of Urban Rail Systems - EXAMPLE OF A TRAM WITHOUT CATENARY

Project in Aachen

...as in Nice and several other cities...

LIGHT RAIL POWER SUPPLY PROVIDES HIGH-PERFORMANCE CHARGING INFRASTRUCTURE FOR OTHER MODES OF TRANSPORT



Source: Müller-Hellmann, VDV

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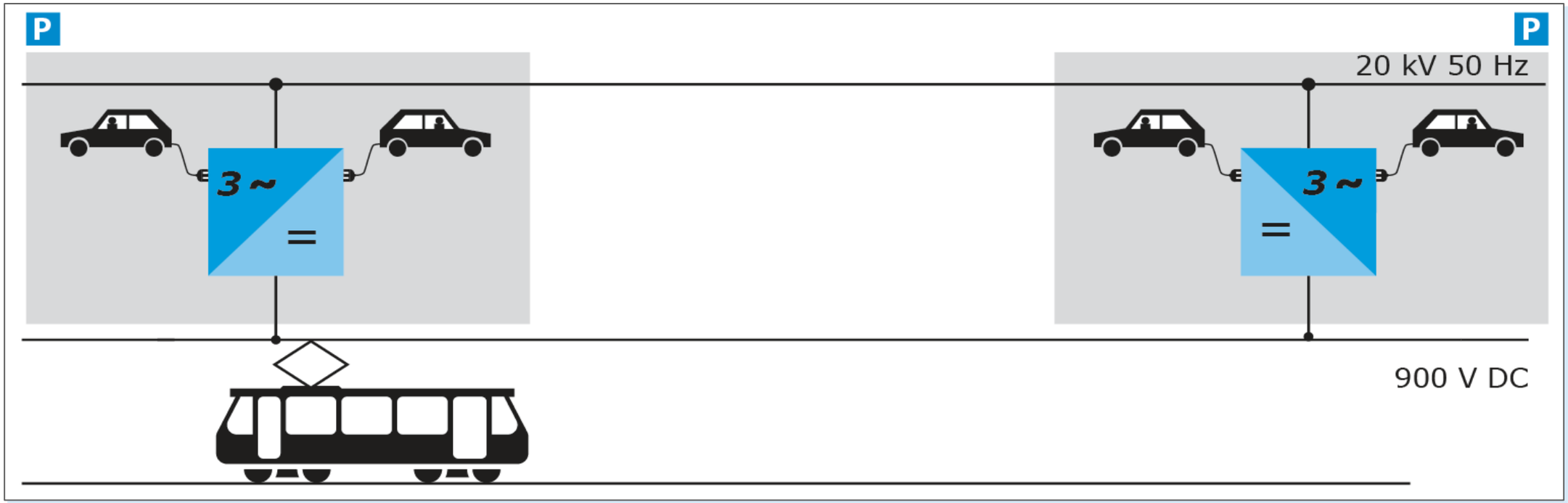

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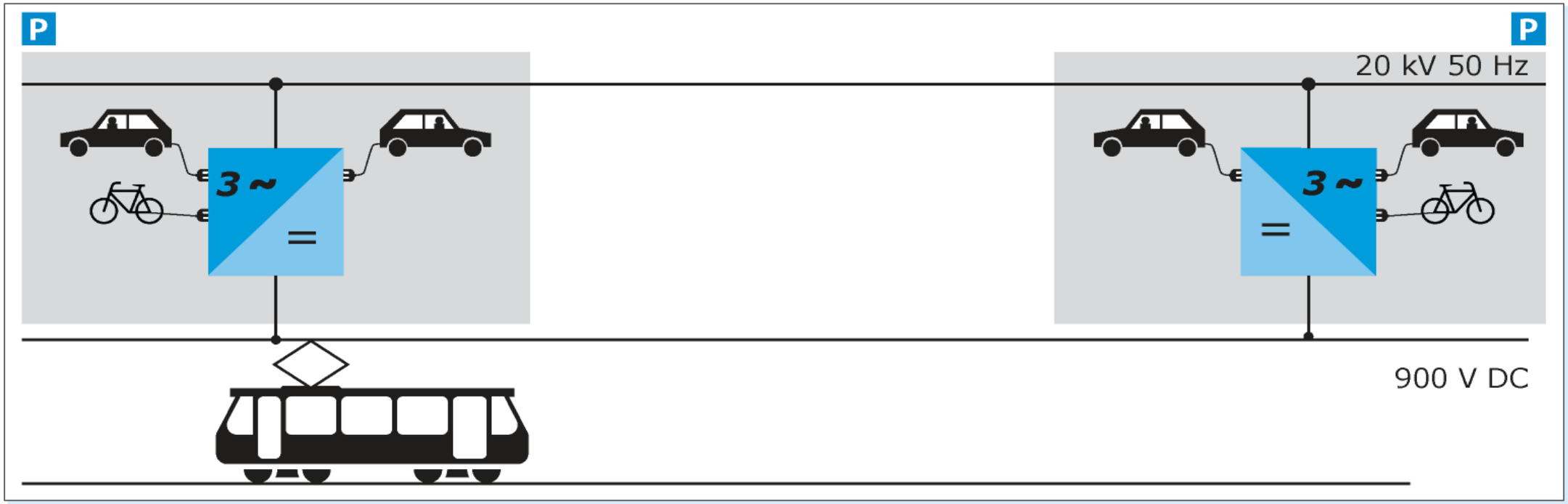

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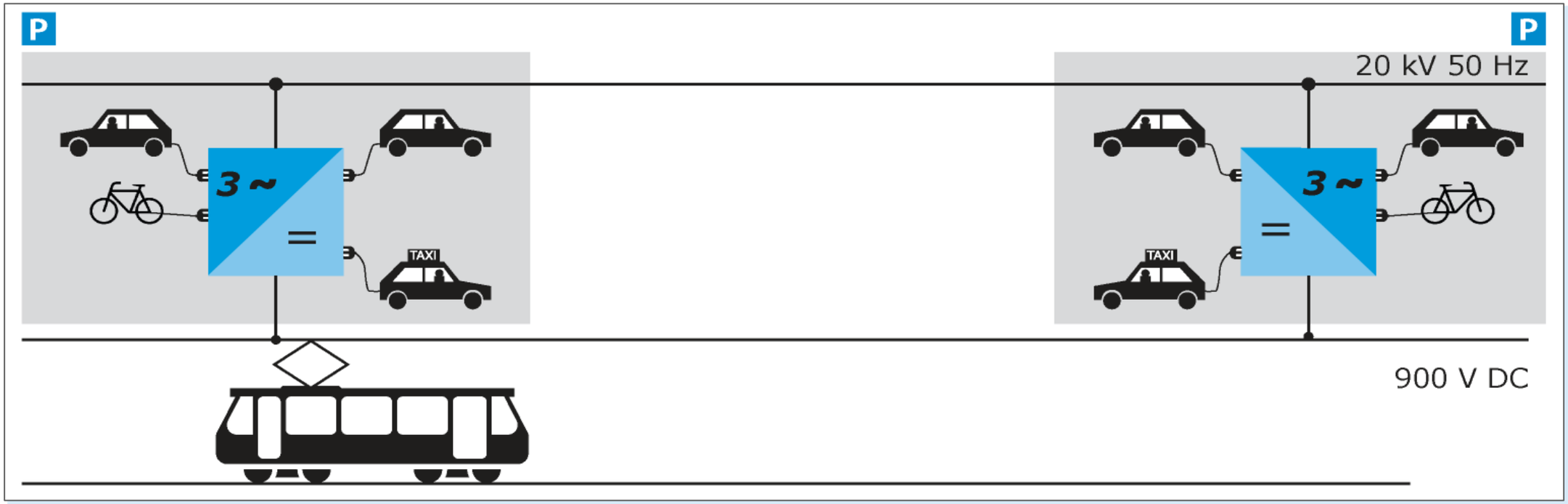

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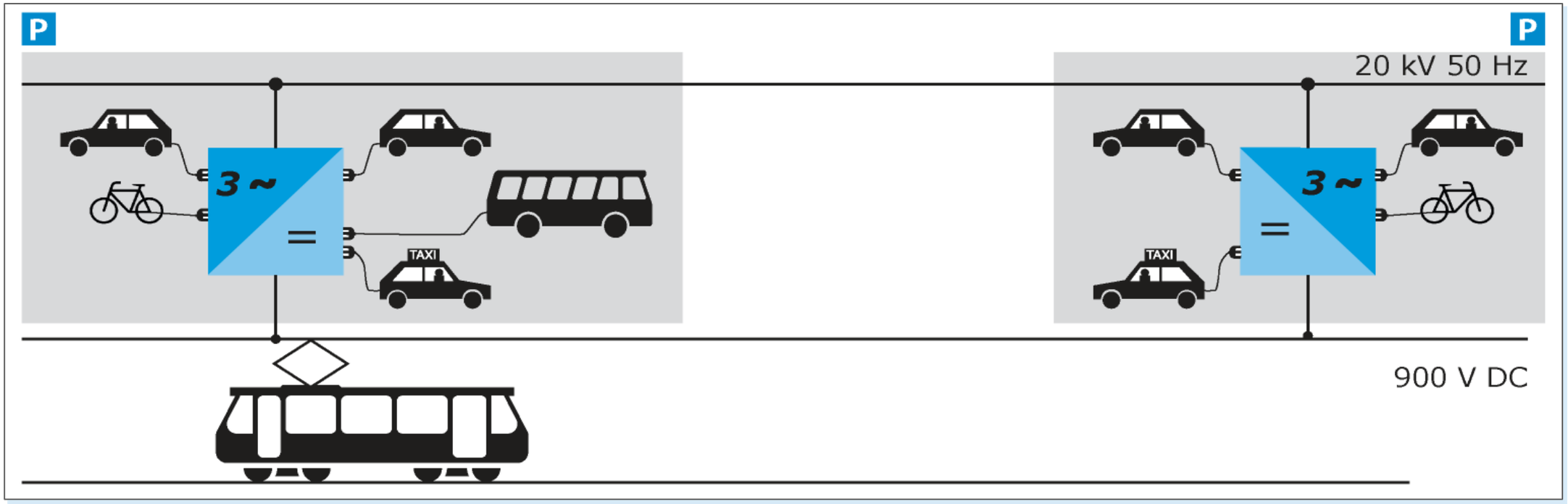

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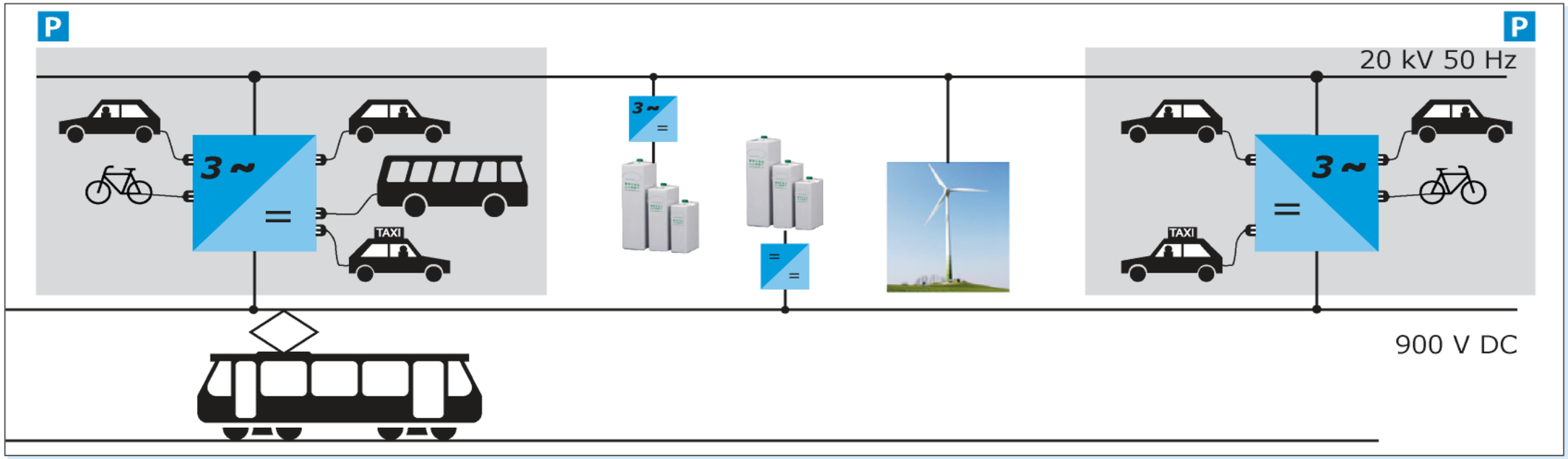
FEEDING REGENERATIVE ENERGY INTO THE LIGHT RAIL POWER SUPPLY AND STORING ENERGY



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