

Exploiting Potential Gross Economic and Environmental Benefits of 2nd-Life Battery Energy Storage Systems by Mechanisms Allowing Operators to Share in the Value Creation

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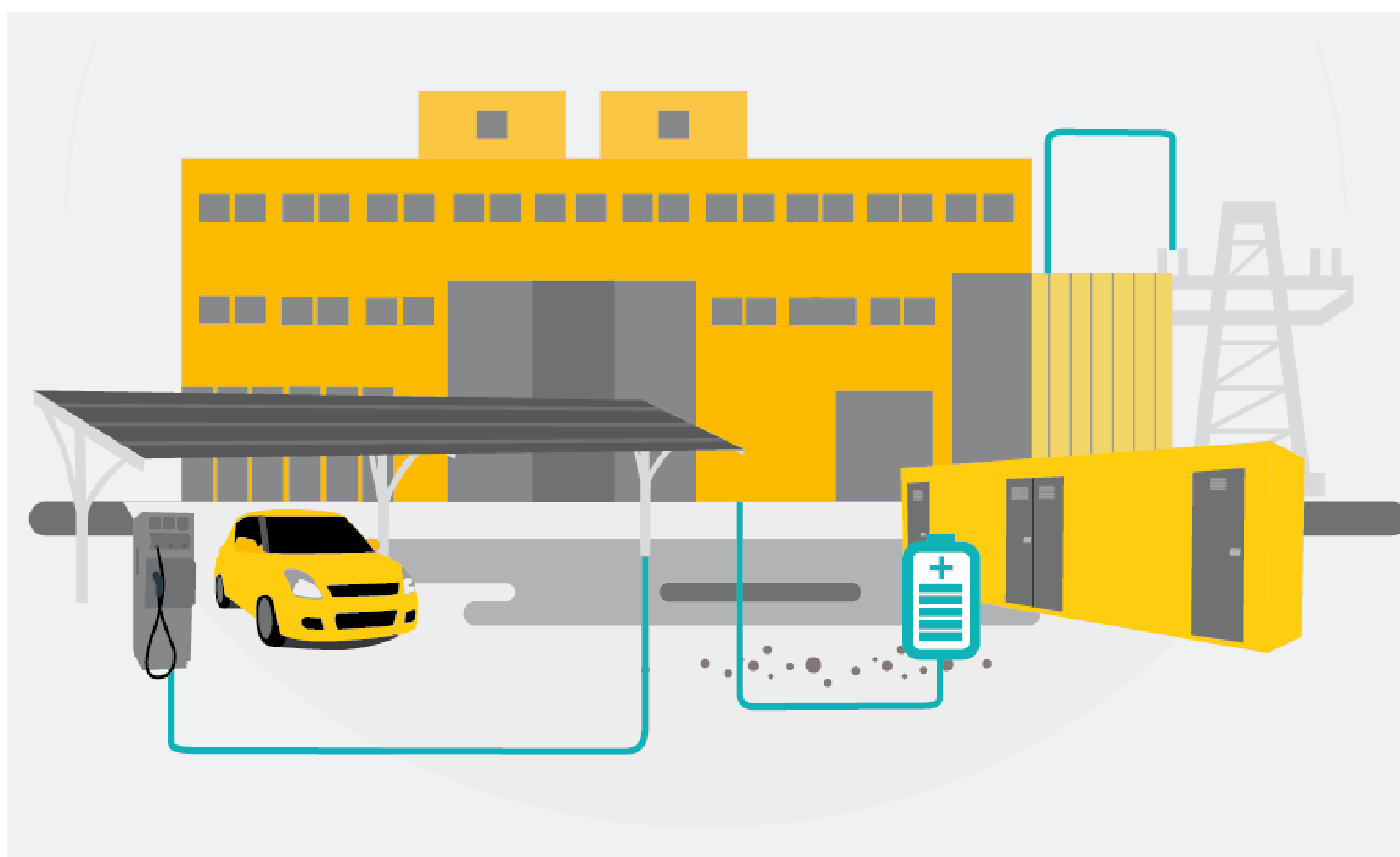
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The synergies between electrification of vehicles and the power sector are strong and the technical potential of 2nd-life EV batteries is tremendous:

⚡ 750,000 2nd-life EV batteries can provide all the primary reserve presently needed in the EU

⚡ 7.5 million 2nd-life EV batteries can bridge a full black-out in the EU for about 20 minutes

⚡ 75 million 2nd-life EV batteries cover 25 % of the short-term storage needed for 100 % RE



suitable regulatory framework
allowing BESS operator to share in
value created for power sector

less curtailment
of renewable electricity - avoided fossil
power generation - reduced losses
within the power sector

economic value
for power sector 2-3 times
the BESS cost

environmental benefits
largely overcompensating
impact of BESS production

Suitable operation of decentralised battery energy storage systems (BESS) can create a value for the power sector 2-3 times the costs by reducing renewable electricity generation curtailment and fossil power generation. This goes along with environmental benefits, notably greenhouse gas emission abatement, which overcompensate the environmental impact of the BESS production. These effects are enhanced if BESS with 2nd-life batteries are used which are extracted from electric vehicles after their capacity has fallen below a specified threshold after some years of operation, and which are subsequently used for stationary applications instead of being recycled straightforwardly. Even for a low electrification rate of the vehicle fleet, the technical potential of such

2nd-life BESS is tremendous: the entire need for frequency response and reserve could be provided more or less as a side effect and the power sector's flexibility could be raised significantly, thus ensuring stable grid operation even at a high penetration rate of fluctuating renewable power generation. The existing regulatory framework puts obstacles if not impedes operators to share in the value they can create for the power sector. As a result, BESS operation is not optimised with regard to system value creation and environmental benefits, and less BESS are installed due to lacking business opportunities. The core element of a better suitable framework is a sufficient remuneration for BESS operation serving the power sector as a whole.