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## SOBER ASSESSMENT OF ECONOMIC FEASIBILITY OF RENEWABLE ENERGY AND VEHICLE-TO-GRID TECHNOLOGIES IN UKRAINE

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**Purpose.** Estimate economical rationale of vehicle-to-grid technology (V2G) in Ukraine in with and without renewable energy systems.

**Methodology.** Open sources, market research and economical assessments regarding the prices of renewables, electric vehicles and charging infrastructure were used to forecast further situation with green technologies in Ukraine.

**Findings.** Ukraine undergoes transition from heavily-industrialized post-Soviet republic into a unique combination of agricultural plus high-technology country. As a heritage it has excessive electric power utilities, which generating capacity exceed actual demand [1]. As a result, the tariff for electricity in Ukraine is one of the cheapest in the world, 1 kWh costs roughly 0.06 EUR. Thus, renewable energy sources cannot compete on the open market without government incentives. The later became viable just recently and caused a surge of installation of photovoltaic stations in Ukraine. The number and total capacity of PV stations doubled during 2018 [2,3]. Similar situation is with electric vehicles (EVs) – because of cheap electricity, the number of EVs grows rapidly, far outnumbering the capacity of charging infrastructure [4].

EVs are called ‘green vehicles’, somewhat delusively, because the primary energy comes from burning fossil fuels. Meanwhile, there is a problem with uneven generation of renewable sources. One of the ways to mitigate the problem of excessive/insufficient generation is the use of EVs as intermediate accumulators of electricity [5,6]. The idea is

buying electricity (charging the battery) at cheaper rates (night tariffs) and ‘selling’, i.e. generating it back to the grid during the expensive tariff.

Our study shows that yes indeed, the idea would be feasible in Ukraine now, if there were charging infrastructure in place. But time is running out. The ‘green tariff’ declines and by 2025 it will be equal to the price for conventional electricity [7,8]. Most probably, V2G will evolve into full-scale effect in Ukrainian grids.

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**Key words:** renewables, green tariff, electric vehicles, V2G

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