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**Title: An Analysis of Individual and Community Solar PV Adoption Levels under Current Regulations in Switzerland using Agent-Based Modelling**

**Authors (will be included in the CISBAT application portal separately)**

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The Swiss electricity system is undergoing a major transformation that includes the closure of nuclear power plants and its replacement with renewable energy sources. In January 2018, a new legislation entered into force in Switzerland that set the target of reaching 11.4 TWh of electricity from renewable sources (excluding hydropower) by 2035. To achieve it, Switzerland will have to multiply renewable installations across the country, which produced just 2.5 TWh in 2017.

Solar photovoltaics could play a major role in achieving the 2035 target, due to rapidly falling solar PV system prices. which are now one third that of one decade ago. However, the diffusion of solar PV has been slow and will need to accelerate significantly. The New Energy Act (2018) contains provisions that encourage the adoption of solar PV in the form of community solar systems. Community solar refers to shared ownership of photovoltaic installations that provide power and/or financial benefit to multiple community members. This form of development offers advantages over individually-owned solar systems such as being inclusive to customers who may otherwise not be able to access solar and lowering average per household costs by taking advantage of economies of scale and sharing upfront administrative and installation costs

Despite clearer financial and legal structures under the ZEV (Zusammenschluss zum Eigenverbrauch) in the New Energy Act 2018, there is scarce research on how this new policy will fare, especially with changing electricity prices and falling solar PV costs. An analysis of individual and community solar PV adoption would provide insights into the dynamics to be expected under the new regulation with important implications for policy-makers.

In this paper, we explore this question using an agent-based model to simulate the individual and community adoption of solar photovoltaic systems. The agent-based model developed in this research uses the theory of planned behaviour for behaviour predication and validated energy data generated from a district model of nearly 2000 building blocks in the city of Zurich using the City Energy Analyst (CEA). This approach allows the analysis of how the geographical location of households, their environmental attitudes, the pressure from peers, and the electricity and solar PV prices interact with the framework set by the new regulation and their impact on the evolution of solar PV adoption. This work will inform policy-makers about potential short-comings of the new regulation, for example, regarding the barriers to form communities for the installation of solar PV systems, individual and community PV adoption levels and whether these levels to be expected are in line with the targets set for 2035 or not. This research also contributes to the literature on community solar, deployment policy design and agent-based modelling.