



A research project for an enhanced rooftop PV integration through kinetic storage and wide area monitoring Lenos Hadjidemetriou, Yiannis Tofis, Elias Kyriakides

Impact • 5-8% increase of the Kinetic Battery Storage System (KBSS) efficiency • 7-10 years extension of the PV inverter lifetime • Low-cost monitoring of the now-casting PV production of the rooftop PVs • Awareness of the distribution grid operating conditions • Improve of the power system quality and stability (i.e., voltage and frequency support, congestion management, flexible load shedding, voltage symmetrizing) ○ 10% decrease of the peak demand ratio \circ 20-30% decrease of the prosumer's exchange power o 2-3% minimize of the prosumer losses Proposed **PV** system

architecture **Experimental verification of the project results** Distribution Laboratory setup for the proposed system architecture Network dSPACE (DS1104) Inverter PC with MATLAB/ (SEMITEACH Simulink Real Time B6U+E1CIF+B6CI) Interface and dSPACE ControlDesk Distribution Vab, Vbc, VcA Network Monitoring Tool (DNMT) Eletoyia's AC Source (California server Instruments 2253ix) DC Power Supply DSO Load Bank (EA-PS 9750-20) Website (prosumer's controllable and solation Transformer for grid uncontrollable Internet interconnection (5kVA, yD) loads)







