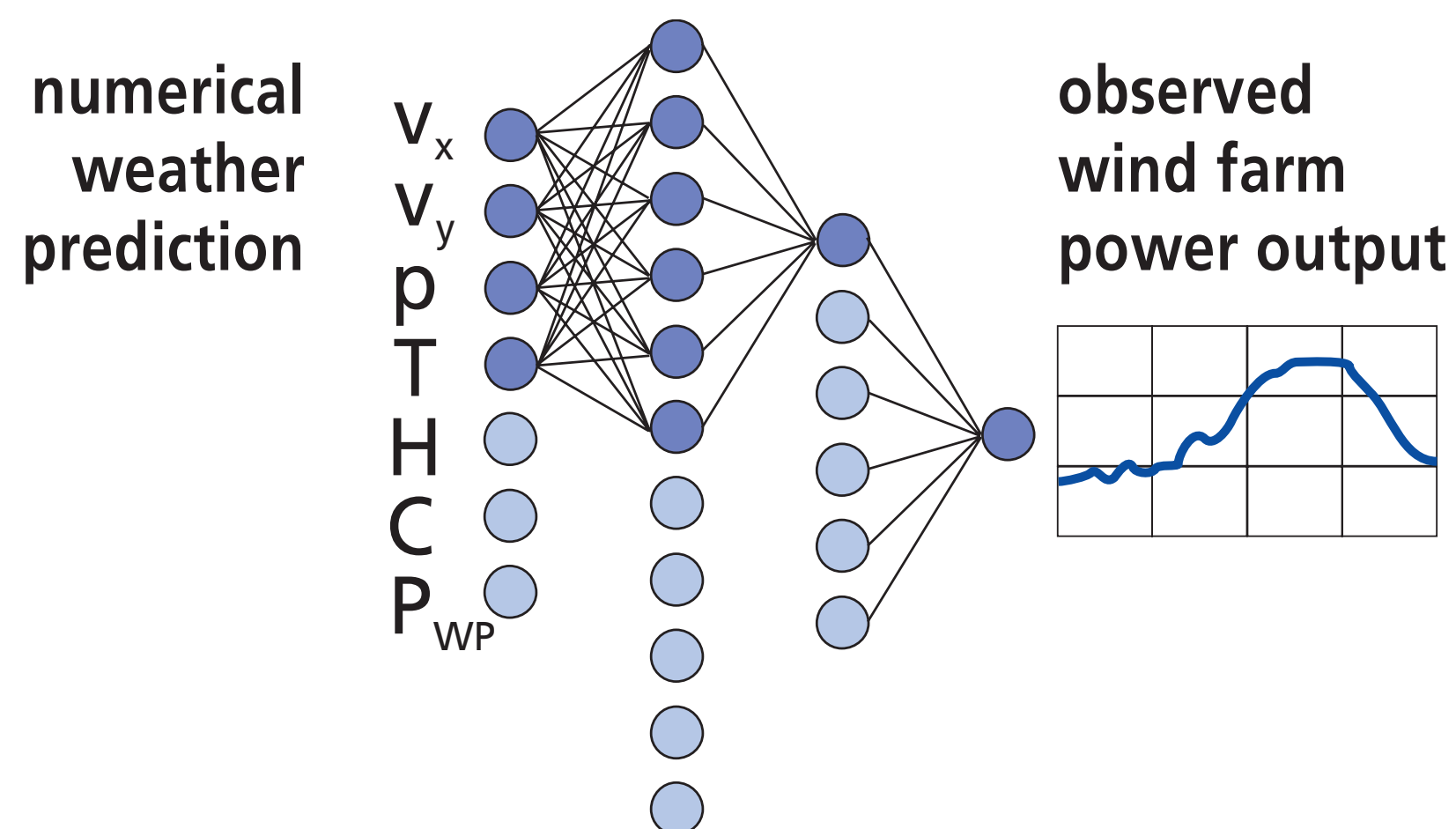


Energy Management System for Island Grids

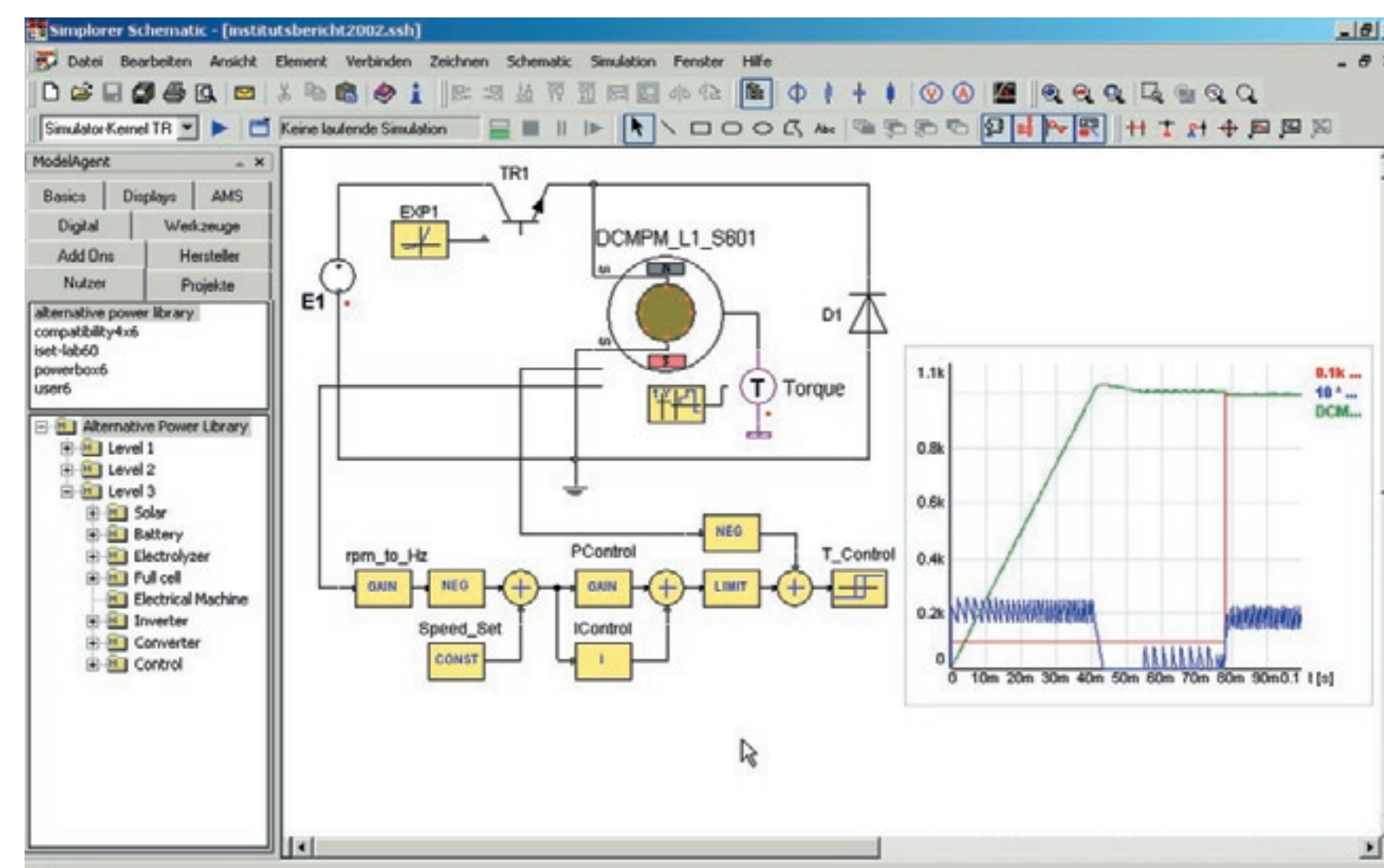
D. Lehmkuhl, K. Rohrig, C. Trousseau, M. Vandenberg

Single Grid



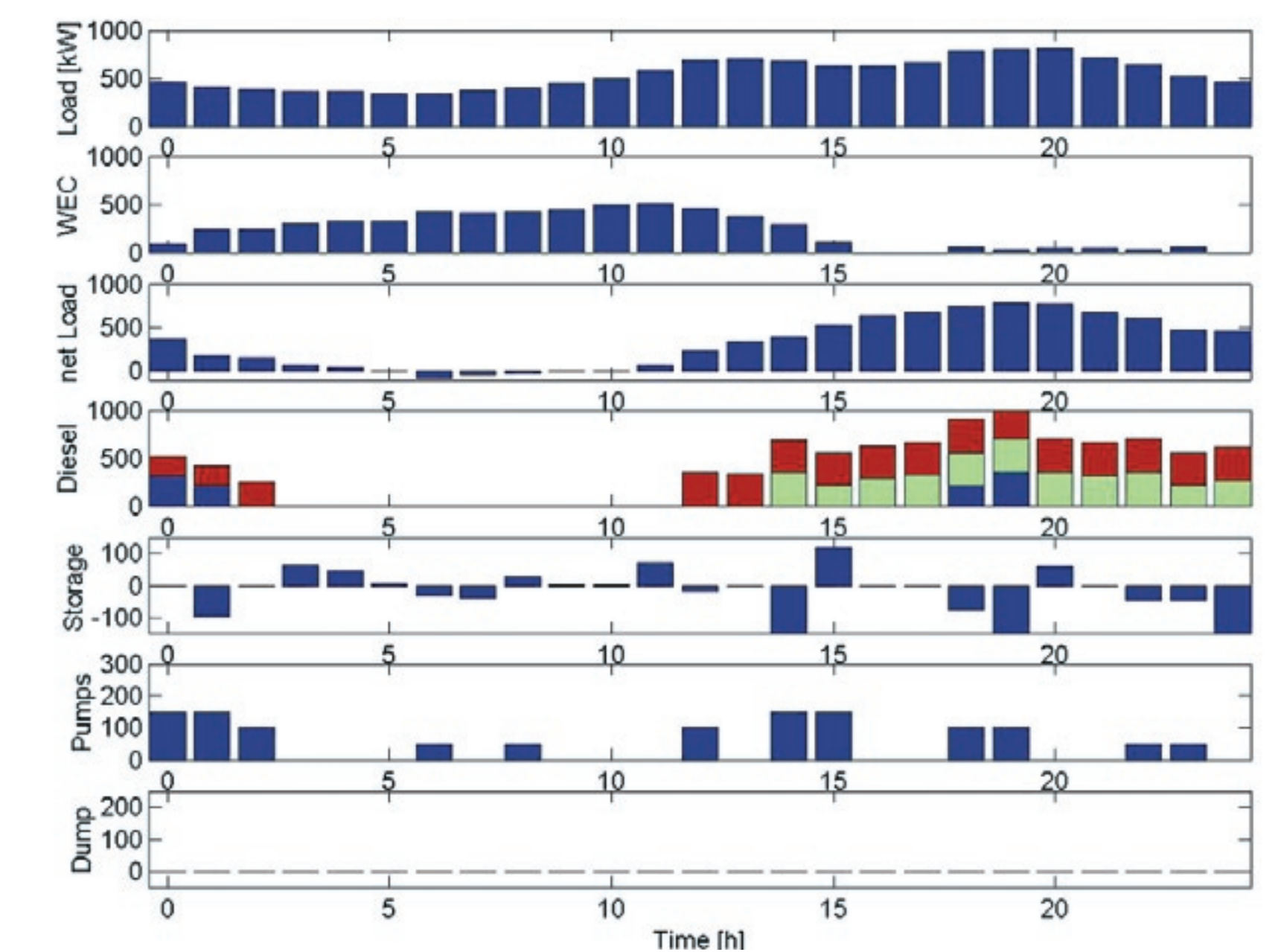
Weather and load prediction

In frame of governmental and EC funded projects and in co-operation with the German TSO's E.ON Netz, RWE Net and Vattenfall Europe Transmission, ISET has developed a new planning tool to support large-scale wind power integration into the electrical energy supply system - the Wind Power Management System (WPMS).



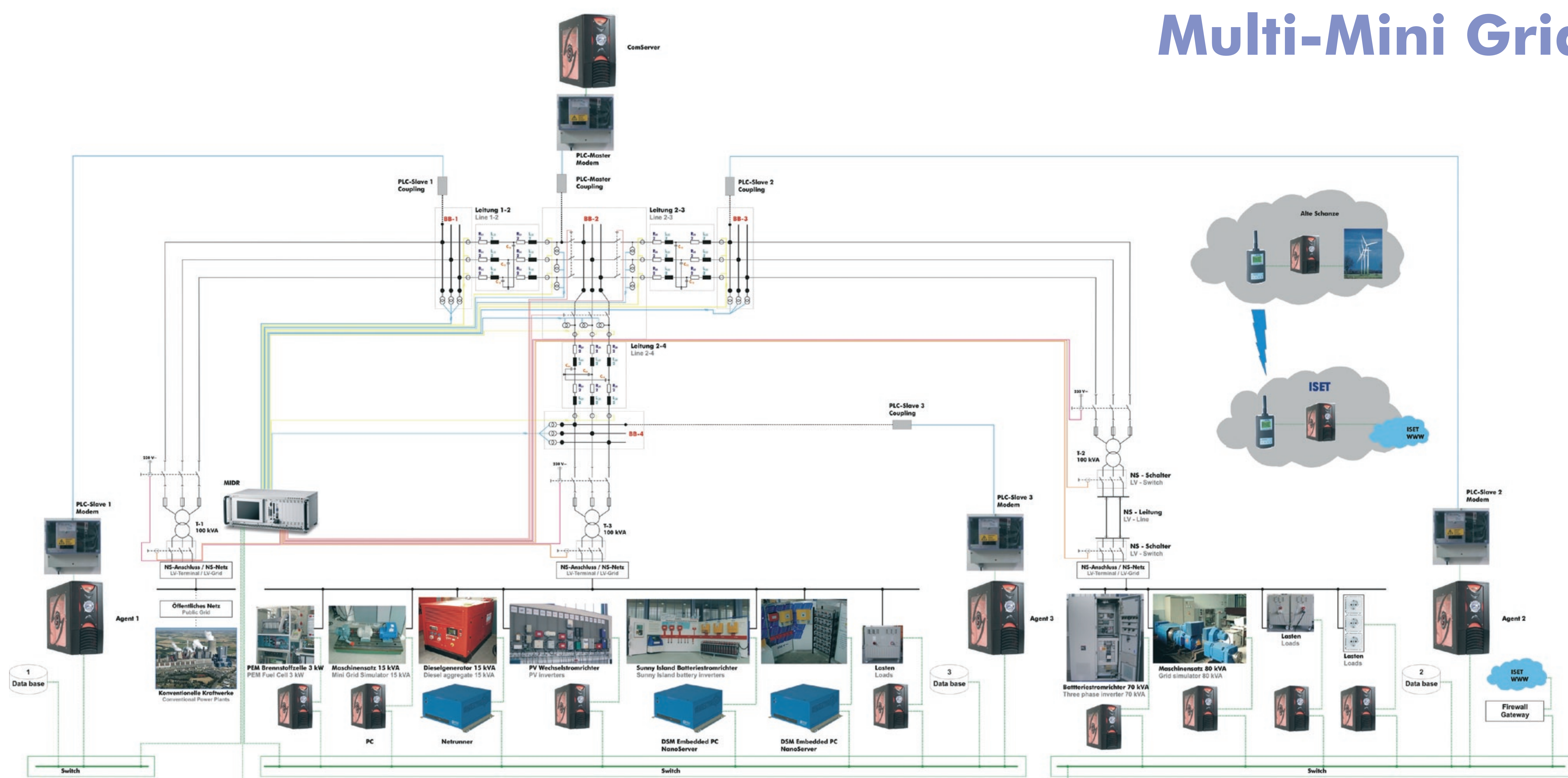
Power system simulation with ISET Alternative Power Library

ISET's universal model library for the simulation of decentralized power supply systems is available world-wide via ANSOFT (USA)



Cost Optimization of the power dispatch for the island of Kythnos in Greece (6 diesel generators of 400 kW each + 500 kW wind turbine). Data for Sunday, 14th of January 2001

Multi-Mini Grid



Test facility DeMotec: real implementation of multi mini-grid interconnection

Island grids with a high portion of energy generated from renewable energy sources (RES) or/and from cogeneration units (CHP) are emerging worldwide. Due to the unpredictable power production of RES units and CHP units and to the use of short-term (several hours) storage units (e.g. lead acid batteries), the energy production from conventional diesel generators is difficult to optimize. Several dispatch strategies are possible for running the system. The

optimal dispatch strategy aims at minimizing the global system operation cost (fuel, operation and maintenance, ...) while respecting the system constraints (e.g. maximum start/stop cycle for diesel generators, ...). The role of the Island Energy Management System (IEMS) is to support the daily operation of such complex power systems, by providing an optimal dispatch strategy. The IEMS software developed by ISET is composed of modules for weather

and load prediction, for power system simulation, for unit commitment and dispatch optimization based on generation cost. The software has been designed to be easily adapted for any type of power system. Additionally, several mini-grids running their own IEMS can be interconnected. Automatic trading of power is organized between the mini-grids, using software agents.