

# Computing@PNNL SEMINAR

## *Large-scale Synthetic Datasets to Enable Resource Management Studies for the Future Smart City*



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High-performance computing and resource management techniques are needed to solve energy management problems in the “Smart City.” The Smart City is a multidisciplinary concept that can be broadly defined as the integration, management, and coordination of existing and future infrastructure to address existing and emerging issues in urban environments. In this seminar, Dr. Hansen will explain the Smart City in the context of energy systems, particularly smart buildings and the cost per-unit energy. Resource management optimization techniques, often used in computing systems, will be explored to manage energy use intelligently, from an entire city to the individual building level. Methods for creating synthetic energy datasets at the individual appliance level (e.g., a washing machine) that combine into realistic city-sized loads will be explained, motivating the need for HPC techniques to solve the Smart City energy resource management problem. Other topics will have broad applicability to science and engineering researchers, including what determines the per-unit cost of energy in a given system, why the Smart City is an interesting research topic that requires a multidisciplinary approach to novel solutions, and how HPC can be used to solve city-sized optimization problems.