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Energy Efficiency in Subway Systems through Port-Hamiltonian Formulation

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Efficient mobility and sustainable transportation are crucial for driving economic growth and preserving the environment in today's globalized society. However, the transportation sector, responsible for a substantial portion of energy consumption and CO₂ emissions, presents a significant challenge for achieving sustainable and ecological transformations, especially in countries like Germany. Rail transport, a key mode of transportation, plays a major role in electricity consumption.

Despite Germany's progress in enhancing energy efficiency, there remains untapped potential for further reducing energy consumption and CO₂ emissions. The EKSSE research project is focused on improving the energy efficiency of Nuremberg's and Hamburg's subway systems. This presentation outlines the project's objectives and introduces various approaches for modeling the subway system as a port-Hamiltonian system, offering a promising avenue for optimizing energy usage.

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