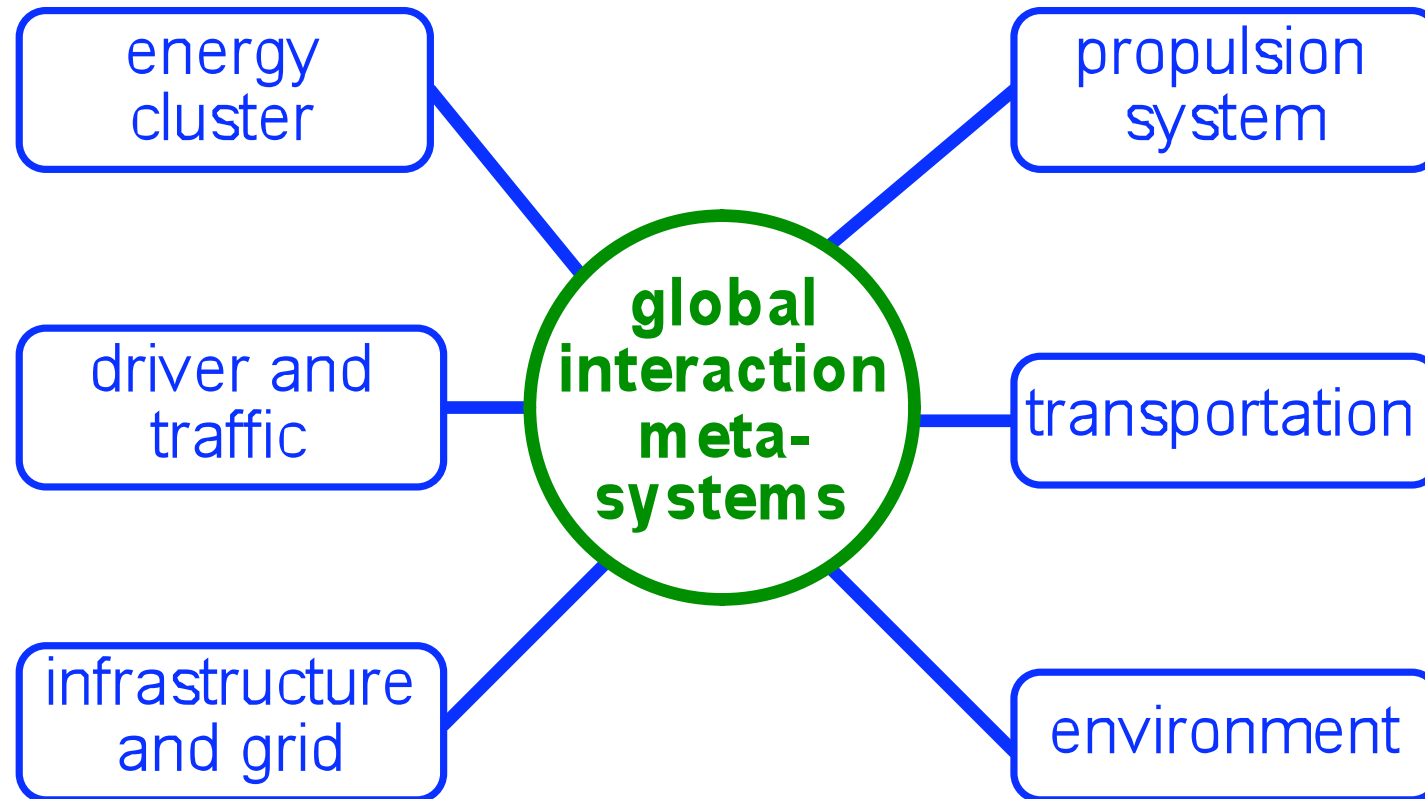
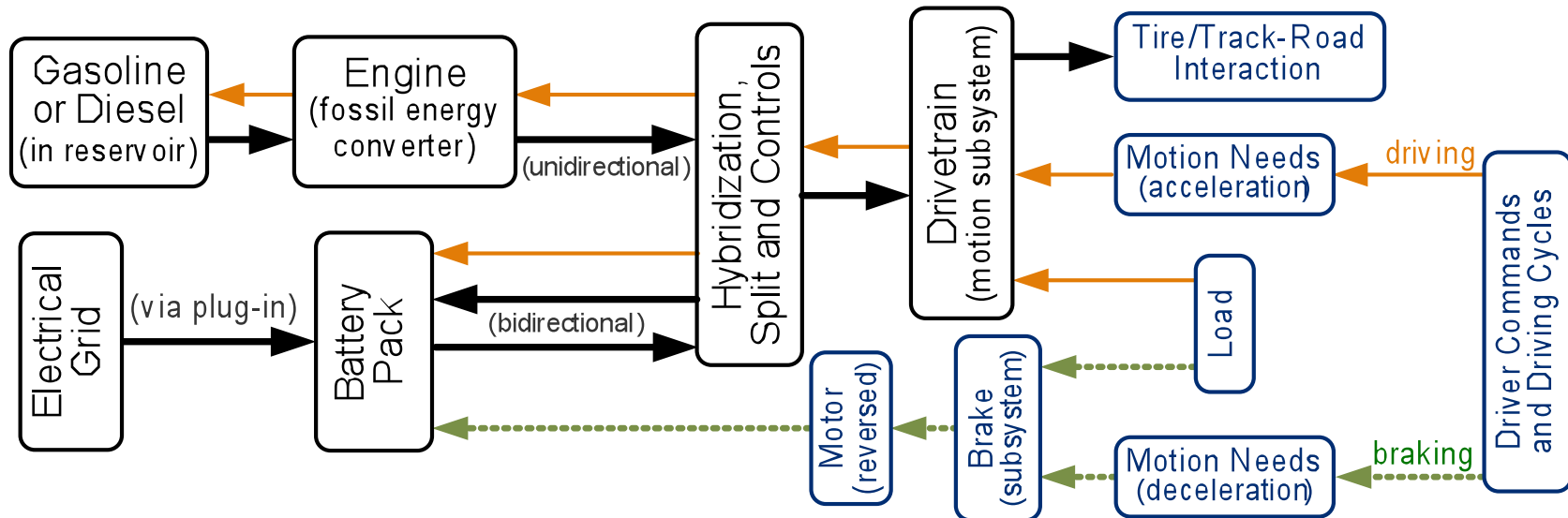


System-level Interaction System



System-generic global functional interaction among energy, traffic, driver, environment, transportation and infrastructure.

System-specific vs System-generic



- Reconfigurable systems of systems and meta-systems
- Inter-conversion of energy, power and motion
- Functional identification, abstraction and representation
- Purpose-driven for large-scale system interaction

Objective and Approach

Objective:

Engineering research on large-scale system interaction among energy, traffic, vehicle, transportation and infrastructure toward system-level performance prediction, evaluation and optimization.

Approach:

- Generalized modeling of combined energy, vehicle and driver based on functional performance and constraint identification.
- Application to large-scale, system-level interaction incorporating energy, trip purpose, traffic, propulsion, highway conditions, hybridization, controller and infrastructure.
- Efficient large-scale system simulation via reconfigurable and modularized meta-systems – providing high level representations of energy, power and motion at all scales.

Impact

- Investigation of global energy and transportation interaction by functional analysis of engineering interaction system
- Exploration of flexible and reconfigurable global interaction system that can combine, integrate, insert, replace and extend explicit local interaction system
- Understanding system-level contribution to global performance prediction and evaluation by capturing and representing system component attributes and properties
- Inversely predicting system-level system or subsystem needs toward preconditioned global performance goal
- Global issues and quantitative predictions of large scale system for policy makers to guide technology development