

Electrified Powertrain and Vehicle Modeling

With *GT-SUITE's* vehicle modeling tools, EngSim can model conventional, hybrid, or full-electric vehicles to optimize strategies for best performance and fuel economy over any drive cycle.

Simulation Capabilities

Fuel Economy Prediction

- Drive-cycle fuel predictions
- Development of control strategies to maximize FE potential of advanced components
- Four types of engine coupling: detailed, FRM, mean value, and map based

Conventional Vehicle

- Integrating stand-alone engine and vehicle models
- Using GT-Drive+ to build standard vehicle models
- Validation of vehicle using benchmark data
- Shift strategy generation and optimization

48v Mild Hybrid Vehicle

- Evaluating 48v technologies such as BAS and eBooster
- Building GT and Simulink based first phase controls to maximize FE potential

Hybrid Vehicle

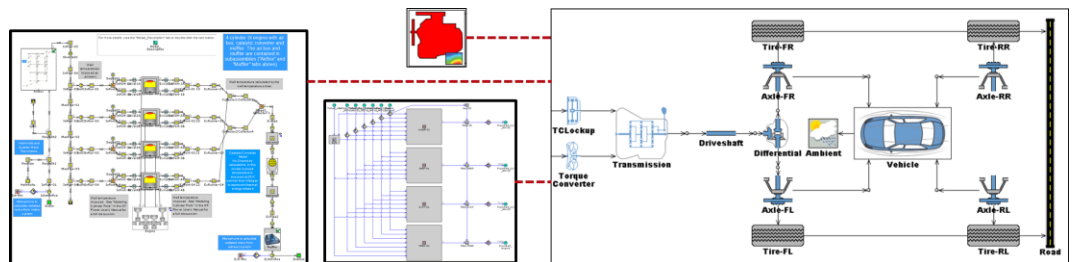
- Battery and motor sizing
- Architecture analysis
- Building GT and Simulink based first phase controls to maximize FE potential

Full Electric Vehicle

- Evaluating energy regen options
- Running battery range tests

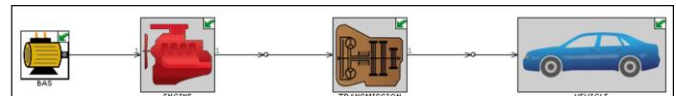


Four types of engine models can be used to build a system level vehicle analysis – detailed engine, Fast Running Model (FRM), mean value engine, and engine map.

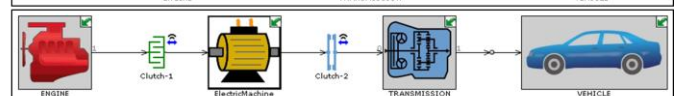


Different types of hybrid architecture come with advantages and disadvantages. Mild hybrid architecture was studied with a client and published at the 2018 SAE World Congress.

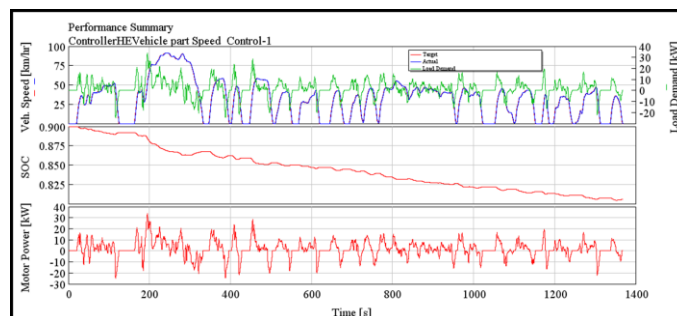
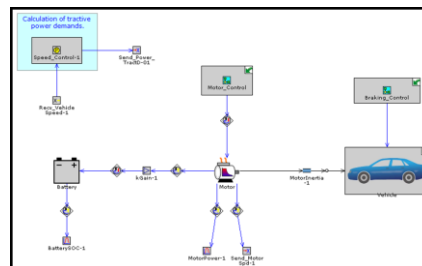
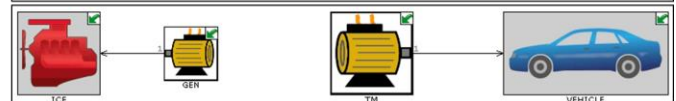
Mild Hybrid



Parallel Hybrid



Series Hybrid



Electric vehicles can be designed to achieve the target load demand. The battery and motor can be sized according to the FE target and performance. Energy regeneration can be quantified.