

Research Study Title	Impact of High Speed Train System Development in Thailand on Electricity Consumption and CO <sub>2</sub> Emission
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### Abstract

According to the long term planning of Thailand's high speed trains (HSTs) system, which will inevitably increase both electricity demand and CO<sub>2</sub> emission. Thus, this research focus on the estimation of electricity requirement and CO<sub>2</sub> emission based on using current high energy - efficient HSTs and the provided information in High Speed Train Master Plan (HSTMP), namely the routes, distances, HST's velocity and daily travel demand of each routes. HSTs of some countries in Europe and Asia were studied to identify the suitable model for using as an energy efficient HST model in this study. The results showed that Japanese HST model N700, which has the lowest specific energy consumption of 0.029 kWh/seat-km with speed of 270 km/h, was the model selected in this work. The HSTs for four studied routes, namely Bangkok - Chiang Mai, Bangkok - Nong Khai, Bangkok - Chanthaburi and Bangkok - Padang Besar routes, required the total maximum power supply of 294.48 MW and electricity consumption of 305 GWh/y, and the total amount of carbon dioxide released was 166.59 kton CO<sub>2</sub>/y with the specific CO<sub>2</sub> emission of 0.01585 gCO<sub>2</sub>/seat-km. Bangkok - Chiang Mai route, which is the highest travel demand, consumed the highest energy consumption of 103 GWh/y and emitted the highest amount of CO<sub>2</sub> of 56.05 kton CO<sub>2</sub>/y. While Bangkok - Nong Khai route had the lowest energy consumption of 34 GWh/y and CO<sub>2</sub> emission of 18.51 kton CO<sub>2</sub>/y.

**Keywords:** CO<sub>2</sub> emission factor/ Energy Consumption/Electricity Consumption/High Speed Train/  
High Speed Rail/Maximum Power Supply/Specific Electricity Consumption