

ABSTRACT:

Electricity and energy sector are identified as the major carbon dioxide emitter. Coal, natural gas, diesel, oil and hydro are the sources to generate electricity in Malaysia. In the 9th Malaysia Plan, government of Malaysia encourage power producer shift from heavy reliance on natural gas and enhance use of biomass. Agriculture residue; palm oil residue, rice processing residue and wood processing residue were considered as fuel sources to generate electricity in this study. An MILP model has been developed to optimize fuel mix and meet CO₂ emission target. The model was developed and implemented in General Algebraic Modeling System (GAMS) for the fleet of electricity generation in Peninsular Malaysia only. In order to reduce the CO₂ emissions by 35% from current CO₂ emission level, the optimizer has specified to switch from coal to natural gas and biomass from palm oil residues as a fuel. Therefore, agriculture residue is a promising fuel sources for electricity generation at the same time reduce CO₂ emissions.