ABSTRAK

Keterbatasan energi yang bersumber dari fosil melatarbelakangi kebijakan mobil listrik di Indonesia yang berpengaruh terhadap penentuan lokasi SPKLU termasuk penentuan lokasi SPKLU yang optimal di ruas tol Trans Jawa. Optimalisasi lokasi SPKLU di ruas tol Trans Jawa didapat dari perhitungan kriteria ekonomis dan kriteria teknis. Hasil perhitungan fungsi minimum dari kriteria ekonomis dan kriteria teknis memiliki satuan yang disamakan berupa indeks level. Kriteria ekonomis optimalisasi lokasi SPKLU adalah biaya instalasi, Kriteria ekonomis memiliki beberapa sub kritera yaitu sub kriteria biaya lahan, sub kriteria biaya konektifitas, sub kriteria biaya pemasangan, sub kriteria biaya daya listrik. Kriteria teknis terdiri dari kriteria kapasitas daya SPKLU, kriteria kualitas daya SPKLU, kriteria realibiltas daya SPKLU, kriteria probabilitas kedatangan kendaraan di SPKLU. Kriteria teknis memiliki beberapa sub kriteria yaitu sub kriteria faktor daya SPKLU, sub kriteria daya SPKLU, sub kriteria kuat arus SPKLU, sub kriteria tegangan SPKLU, sub kriteria tahanan kabel tembaga, sub kriteria luas penampang kabel tembaga, sub kriteria jarak pembangkit listrik ke SPKLU, sub kriteria nilai pengendalian jejak, sub kriteria tetapan pengendali visibilitas,sub kriteria intensitas jejak semut. Sub kriteria pada kriteria teknis memiliki hubungan saling mempengaruhi sehingga metode pembobotan dilakukan menggunakan *Analytical Network Process* (ANP) dengan menggunakan alat bantu perangkat lunak *superdecisions*. Kriteria laju kedatangan kendaraan di SPKLU menggunakan algoritma koloni semut.

Jumlah usulan SPKLU berdasarkan laju harian kendaraan di jalan tol Trans Jawa yang diasumsikan 0,001 dari LHR jalan tol Trans Jawa merupakan mobil penumpang bertenaga listrik. Dengan tiga lokasi optimal adalah SPKLU di rest area KM19A, rest area KM57A dan rest area 575B.

Kata kunci: SPKLU, jalan toll.

ABSTRACT

Limited energy from fossil sources is behind the electric car policy in Indonesia which influences the determination of SPKLU locations, including determining the optimal SPKLU locations on trans Java toll road. Optimization of SPKLU locations on the trans Java toll road is obtained from calculating economic criteria and technical criteria. The results of calculating the minimum function from economic criteria and technical criteria have the same units in the form of a level index. The economic criteria for optimizing SPKLU locations is installations cost. The economic criteria have several sub-criteria, namely landcost sub-criteria, connectivity cost sub-criteria, installation cost sub-criteria, electric power cost sub-critera. Technical criteria consist of SPKLU power capacity criteria, SPKLU power quality criteria, SPKLU power realibility criteria, and arrival vehicle probability in SPKLU criteria. The technical criteria have several sub-criteria, namely SPKLU power factor sub-criteria, SPKLU power sub-criteria, SPKLU current strength sub-criteria, SPKLU voltage sub-criteria, copper cable resistance sub-criteria, copper cable cross-sectional area sub-criteria, power plant distance to SPKLU sub-criteria, sub-criteria for trail control values, sub-criteria for visibility control settings, sub-criteria for ant trail intensity. The sub-criteria in technical criteria have a mutually influencing of relationship or network, so that the weighting method is carried out using the analytical network process (ANP) using the superdecisions sotware tool. the criteria for vehicle arrival at SPKLU uses the ant colony algorithm.

The proposel number of SPKLU based on the daily rate of vehicles on Trans Java toll road, which is assumed to be 0,001 of the LHR of the Trans Java toll road is an electric vehicles passanger car, with three optimal locations, SPKLU is in the KM19A rest area, KM57A rest area and 575B rest area.

Key words: Charging station, tollroad, optimation.