ABSTRACT

Hotel is one of components in building sector that has been grown up in Indonesia, especially in Yogyakarta as a tourism city. National Standardization Agency of Indonesia (SNI) 03-6389-2011 specifies that in reducing the external cooling load, the Overall Thermal Transfer Value (OTTV) of building envelope must be less than or equal to 35 Watt/m^2. This research investigates the OTTV of building envelope in Cakra Kusuma and Inna Garuda hotel located in Yogyakarta City and then evaluate its materials using Life Cycle Assessment ((LCA) in 'cradle to grave' scope. As result, OTTV of building envelope of Cakra Kusuma and Inna Garuda are 27.9 W/m^2 and 38.4 W/m^2. It indicates that building envelope status in energy conservation perspective of Cakra Kusuma hotel is efficient because its value could fulfill the standard of SNI. In the other side, Inna Garuda hotel is inefficient because its value greater than standard. Based on this analysis, it due window to wall ratio, shading construction and building orientation factors. Life Cycle Assessment recovers all phases in energy and material flow analysis of the components from the building envelope. Total embodied energy in building envelope materials of Cakra Kusuma and Inna Garuda are are 5152.6 GJ and 8050.3 GJ in another form the intensity of embodied energy of Cakra Kusuma and Inna Garuda are 2.89 GJ/m^2 and 3.2 GJ/m^2. In the other hand, the CO_2 emissions of building envelope mateials of Cakra kusuma and Inna Garuda 396.6 ton-CO_2 and 596,8 ton-CO_2. Extraction and manufacture phase was the highest portion for Inna Garuda hotel to consume energy (46.7%) and to release carbondioxide emission (41.9%). In the other hand, construction phase was the highest portion for Cakra Kusuma to consume energy (42.2%) and to release carbondioxide emission (44.3%). The combination analysis of OTTV and Life Cycle Assessment is recommended in conducting green building perspective because it gives more accurate data in considering the energy conservation strategy of hotel buildings during its life cycle phases.

Keywords—hotel; building envelope; OTTV; LCA; embodied energy; CO_2 emissions; energy conservation