A GIS MULTICRITERIA ANALYSIS FOR SITING A SUN/WIND POWERED PLASTIC REPROCESSING FACILITY IN THE CONTRA COSTA COUNTY, CALIFORNIA RECYCLING MARKET DEVELOPMENT ZONE

Abstract

The purpose of this research is to create a model for siting a wind and/or solar powered recycled plastics material transformations plant within the Contra Costa, California Recycling Market Development Zone (RMDZ). The RMDZ Program is a California-wide program that combines recycling with economic development to fuel new businesses, expand existing ones, create jobs, and divert waste from landfills. A major emphasis of the RMDZ program is finding ways to use recycled materials to create new products. The zones cover roughly 71,790 square miles from the Oregon border to San Diego. I am specifically interested in the RMDZ of Contra Costa County.

I conducted a GIS-based multicriteria sensitivity analysis using a weighted overlay technique to examine the impact of various variables under different percentages of influence for siting an optimal industrial location. Since the RMDZ program is an initiative with strong support and enthusiasm, there are many incentives and an ample amount of information for contacting industry experts and administrators.

This research has two parts. First, it discusses the geographic, environmental, and economic issues pertaining to recycling and the use of renewable energies, and also the ‘green’ business development potentials. Second, I conducted a multicriteria sensitivity GIS analysis
using a weighted overlay technique that a ‘green’ entrepreneur can apply to create a recycled plastics material transformations business.

The multicriteria sensitivity GIS analysis model shows that changes in the weighted overlay analysis results are relative to changes in siting criteria importance, identifies criteria that are especially sensitive to their given importance, and allows visualizing the spatial dimension of those changes more intuitively at the jurisdiction and parcel levels. The model found the city of Richmond to be the jurisdiction most suitable across all siting criteria at each percentage of influence except for the ‘Tax Rate’ criterion where Contra Costa County unincorporated areas are the most suitable locations at 76% percentage influence.