

Industrial Geospatial Analysis Tool for Energy Evaluation- IGATE-E

Copyright Document Number
90000002

Copyright Summary

Energy professionals and researchers are often challenged with initiating projects or performing analyses that are the basis for project approval with limited and/or unreliable information. In manufacturing industry-related projects, the challenge is compounded (compared to residential and commercial sectors) because end-use attributes in commercial and residential sectors are more uniform than in the industrial sector. In addition, data on some driving factors are more accessible, like temperature, population densities, or other parameters that are typically used for residential and commercial energy estimation models. Industrial energy consumption is heavily dependent on the type of manufacturing process, production volume, plant size, location, operational parameters, and other variables that are usually proprietary for each manufacturing facility.

To solve these problems, the analytical tool "IGATE-E" (Industrial Geospatial Analysis Tool for Energy Evaluation) was developed. The software provides multi-layer industrial energy information including manufacturing plant level, industrial subsector level, zip code level, county level, balancing authority level, state level, and national level. IGATE-E was developed utilizing MATLAB platform as the existence of numerous tool libraries provides good opportunities for analysis expansion. It utilizes statistical analysis of multiple databases to estimate manufacturing plant energy consumption for over 300,000 manufacturers across the U.S. and provides geospatial interlinking to Google Earth using MATLAB-based mapping tools. A "bottom up approach" was used in the development of this tool whereby the analyses were performed at the granular level of a manufacturing facility and results were aggregated up to zip code and regional values. The current version of the tool is only capable of estimation of electrical energy consumption; however, future versions of this tool should include estimation of fuel energy streams at the plant level as well as other parameters of interest such as Energy Intensive Processes per SIC, Load Curves per Process Step per SIC, Load Factor per type of Manufacturing Plant. IGATE-E provides user-friendly interfaces to examine the various results of the statistical models. The current version of the tool consists of two main modules; electrical energy analysis module and geospatial linking module. The Geospatial button enables the user to geospatially plot individual industries across the U.S. at zip code level and predicted electrical energy consumption. The regression engine interface helps the user to navigate through statistical models to estimate required energy information.

Inventor

ALKADI, NASR E. and STARKE, MICHAEL R.
Energy and Transportation Science Division

Licensing Contact

SIMS, DAVID L. UT-Battelle, LLC
Oak Ridge National Laboratory
Rm 124C, Bldg 4500N, MS: 6196
1 Bethel Valley Road
Oak Ridge, TN 37831
Office Phone: (865) 241-3808
E-mail: SIMSDL@ORNL.GOV

Note: The copyright described above is an early stage opportunity. Licensing rights to this intellectual property may be limited or unavailable.