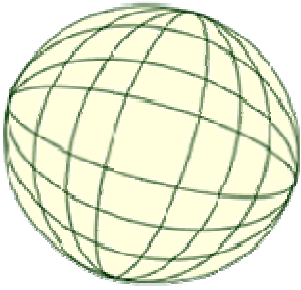


National and State Economic and Environmental Impacts of NETL Employment

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Background

Economic assessment models typically use product-specific and plant-level or national aggregate data. However, many decisions would be better informed by local or regional data. As a collaborative project between Carnegie Mellon, West Virginia University and the National Energy Technology Laboratory (NETL), this research project developed state-level input-output analysis-based economic, employment and air quality impact models for Pennsylvania and West Virginia. The models were used to assess the economic and environmental impacts of NETL employment and economic activities. They can also be used to estimate the regional effects of purchases from any of the nearly 500 economic sectors of the US economy.

Statement of Work

Economic, employment and air quality impacts were evaluated at three model levels, including Pennsylvania and West Virginia state level models as well as a regional model that is the combination of the two states. The environmental input-output life cycle analysis (EIO-LCA) methodology served as the platform for developing these models. The models are based on a national economic input-output model adjusted to state or regional production using state economic sector employment to obtain regional economic multipliers and then linking the resulting regional input-output models to state and regional employment and air emissions factors.

The employment vectors are based on data from the Bureau of Economic Analysis (BEA) and Bureau of Labor Statistics' (BLS) Quarterly Census of Employment and Wages (QCEW) program. The air emissions vectors were created using data from the National Emission Inventory (NEI) compiled by the U.S. Environmental Protection Agency (U.S. EPA), with area source emissions supplemented by the national EIO-LCA model.

The regional coefficient tables were created using location quotient method using the employment vectors. Location quotient method compares the distribution of employment by industry in the study regions and the US. Type I output multipliers with households exogenous are used for comparing industrial economic structures across regions or nations. Finally, the regional coefficient tables and the three impact vectors are incorporated into Matlab files, which are capable of fully implementing the environmental and economic impacts model at the state and regional level.

Results and Conclusions

Using the regional models, the economic, employment, and air quality impacts of four baseline scenarios and nine alternative scenarios were modeled. It is found that NETL operations (NAICS Sector 541700, Scientific Research and Development Services), have the greatest economic impacts in its own sector, the real estate sector, and the glass products sector. Power generation and truck transportation sector activities dominate the air emission impacts of NETL operations. The output multiplier of NETL impacts on PA and WV (per million dollars basis) are between 1.3 and 1.5; employment multipliers, 19 and 20; and emissions multipliers, 9 and 10. This research project established a methodology for developing regional EIO-LCA model that can be applied in future assessments and other sub-national models.

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