

CHAPTER 14. EMPLOYMENT IMPACT ANALYSIS

TABLE OF CONTENTS

14.1 INTRODUCTION	14-1
14.2 ASSUMPTIONS.....	14-1
14.3 METHODOLOGY	14-1
REFERENCES	14-3

CHAPTER 14. EMPLOYMENT IMPACT ANALYSIS

14.1 INTRODUCTION

The U.S. Department of Energy (DOE) intends the employment impact analysis to estimate national job creation or job elimination resulting from possible new standards, due to reallocation of the associated expenditures for purchasing and operating equipment. DOE will conduct this analysis as one of the analyses for the notice of proposed rulemaking (NPR). DOE will estimate national impacts on major sectors of the U.S. economy, using publicly available data and incorporating different energy price scenarios that it will carry out as part of the analysis for the NPR. DOE will make all methods and documentation available for review.

The imposition of standards can impact employment both directly and indirectly. Direct employment impacts are changes in the number of employees at the plants that produce the covered equipment, along with the affiliated distribution and service companies, resulting from the imposition of standards. DOE will evaluate direct employment impacts in its manufacturer impact analysis, as described in chapter 12 of the preliminary technical support document. Indirect employment impacts may result from expenditures shifting between goods (the substitution effect) and changes in income and overall expenditure levels (the income effect) that occur due to the imposition of standards.

14.2 ASSUMPTIONS

DOE expects new equipment standards to decrease energy consumption, and therefore to reduce expenditures for energy. The savings in energy expenditures may be spent on new investment and other items. The standards may increase the purchase price of equipment, including the retail price plus sales tax, and increase installation costs.

Using an input-output (I-O) model of the U.S. economy, this analysis seeks to estimate the year-to-year effect of these expenditure impacts on net economic output and employment. A simple model might involve reduced expenditures for energy and reallocation of that money toward other sectors in the economy. DOE intends the employment impact analysis to quantify the indirect employment impacts of these expenditure changes. It will evaluate direct employment impacts in the manufacturer impact analysis step of the process.

14.3 METHODOLOGY

DOE developed Impact of Sector Energy Technologies (ImSET), a model of the U.S. economy that focuses on sectors most relevant to industrial, commercial, and residential building energy use.¹ ImSET is a special-purpose version of the U.S. Benchmark National I-O model designed to estimate the national employment and income effects of energy-saving technologies deployed by the DOE Office of Energy Efficiency and Renewable Energy. Compared with previous versions of the model used in earlier energy conservation rulemakings, the current version allows for more complete and automated analysis of the essential features of energy efficiency investments in buildings, industry, transportation, and the electric power sectors.

The ImSET model includes structural coefficients to characterize economic flows among the multiple sectors. ImSET's national economic I-O structure is based on the 2002 Benchmark U.S. table,² which is specially aggregated to 187 sectors. The time step of the model is annual and the time scale of the model is 100 years (2001–2099).

The ImSET model allows a great deal of flexibility for analyzing types of energy efficiency effects. For example, certain economic effects of energy efficiency improvements require an assessment of inter-industry purchases, which is handled in the model. Some energy efficiency investments will not only reduce the costs of energy in the economy but also the costs of labor and other goods and services, which is accommodated through a recalculation of the I-O structure in the model. Output from ImSET can be used to estimate changes in employment, industry output, and wage income in the overall U.S. economy resulting from changes in expenditures in the various sectors of the economy.

The following is an example of how the employment impact analysis might track impacts from a standard for automatic commercial ice makers. Depending on the design options considered, one possible outcome is that the standards for this automatic commercial ice-making equipment would reduce energy expenditures and increase equipment prices in the commercial sector. These expenditure changes may reduce energy sector employment and either reduce or increase employment in selected commercial sectors. At the same time, the standard may increase investment in the commercial and industrial sectors and employment in other sectors. DOE designed the employment impact analysis to estimate the annual net national employment impact of these types of expenditure flows.

REFERENCES

1. Scott M.J., O.V. Livingston, J.M. Roop, R.W. Schultz, and P.J. Balducci. *Impact of Sector Energy Technologies Model Description and User's Guide*. 2009. Pacific Northwest National Laboratory: Richland, WA. Report No. PNNL-18412.
2. Stewart, R.L., J.B. Stone, and M.L. Streitwieser. U.S. Benchmark Input-Output Accounts, 2002. *Survey of Current Business* October 2007. 2007. (Last accessed March 11, 2009.)
<http://www.bea.gov/industry/index.htm#benchmark_io>