CHAPTER 14. EMPLOYMENT IMPACT ANALYSIS

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CHAPTER 14. EMPLOYMENT IMPACT ANALYSIS

14.1 INTRODUCTION

The Department conducted an employment impact analysis for the Notice of Proposed Rulemaking (NOPR). The Department's employment impact analysis is designed to estimate indirect national job creation or elimination resulting from possible standards, due to reallocation of the associated commercial expenditures for purchasing and operating distribution transformers. The Department estimated national impacts on major sectors of the U.S. economy, using publicly available data and incorporating different energy price scenarios.

14.2 ASSUMPTIONS

If promulgated, the Department expects furnace and boiler efficiency standards to decrease energy consumption, and therefore to reduce energy expenditures. The savings in energy expenditures may be spent on new investment or not at all (i.e., they may remain "saved"). The standards may increase the purchase price of furnaces , including the retail price plus sales tax, and increase installation costs.

Using an input/output econometric model of the U.S. economy, this analysis estimated 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 of the economy. The Department intends this analysis to quantify the indirect employment impacts of these expenditure changes. It evaluated direct employment impacts at manufacturers' facilities in the manufacturer impact analysis (see Chapter 12).

14.3 METHODOLOGY

The PNNL for the Department of Energy developed a spreadsheet model of the U.S. economy (IMBUILD II), focusing on the 98 sectors of the economy most relevant to industrial, commercial, and residential building energy use.[1] IMBUILD was originally developed as a special-purpose version of the Impact Analysis for Planning (IMPLAN) national input-output model to specifically estimate the employment and income effects of energy efficiency technologies .[2] IMPLAN is routinely used by over 1500 clients at all levels of the government, in academia and in the private sector (http://www.implan.com/references.html). IMBUILD II includes structural coefficients to characterize economic flows among 98 sectors of the economy and track the inter-industry employment impacts resulting from efficiency standards.

Efficiency standards are represented in IMBUILD II by a combination of capital investment and energy savings. These capital investment and energy savings divert spending away from some business sectors and toward others. Accordingly, IMBUILD II measures the

economic effect of a standard as (1) the expansion enjoyed by businesses that receive diverted funds minus (2) the contraction suffered by businesses that lose diverted funds.

IMBUILD II includes a series of input tables that quantify the size of the capital investment and energy savings resulting from efficiency standards. These tables also designate industrial sectors that manufacture efficiency products(and those that lose sales as a result of efficiency standards (including energy supplying firms and utilities).

In an input/output model, the level of employment in an economy is determined by the relationship of different sectors of the economy and the spending flows among them. Different sectors have different levels of labor intensity and so changes in the level of spending (e.g., such as the effects of an efficiency standard) in one sector of the economy will affect flows in other sectors, which affects the overall level of employment. For example, furnace standards may reduce energy expenditures and increase equipment prices in the residential, commercial and industrial sectors. The expenditure changes are likely to reduce commercial and energy sector employment. At the same time, furnace standards may increase commercial sector investment, and increase employment in other sectors of the economy. The Department designed the employment impact analysis to estimate the year-to-year net employment effect of these different expenditure flows.

IMBUILD calculates the total effect of standards on employment, including job creation or deletion in the manufacturing, commercial and retail sectors of the economy. Direct employment impacts, i.e., those that would occur at furnacer manufacturing plants, are presented in the manufacturer impact analysis (Chapter 12).

14.4 ANALYSIS

The results in this section refer to impacts of furnace and boiler standards relative to the base case. The Department disaggregated the impact on jobs into three component effects. Figure 14.3.1 shows the employment impacts of the increased investment on more-efficient furnaces. The increased cost of appliances leads to higher employment in the furnace manufacturing sector and lower employment in other economic sectors. Because furnace manufacturing is relatively capital-intensive, compared to other sectors of the economy, the net result is a small loss of employment.

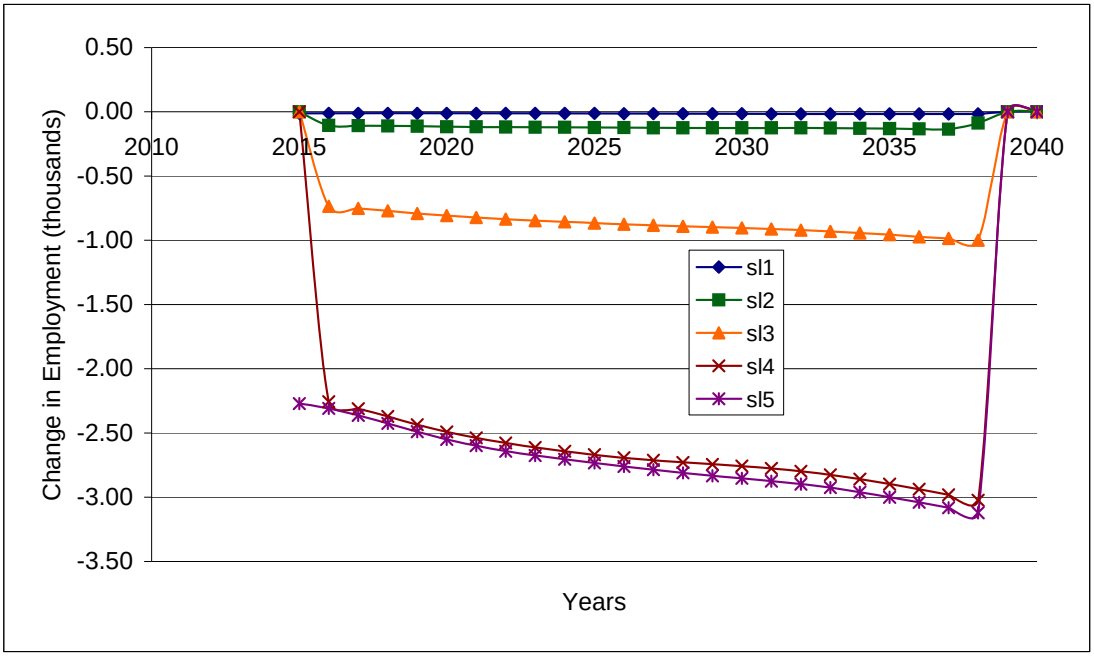

Figure 14.4.1 Employment Impact of Increased Investment on More-Efficient Furnaces and Boilers

Figure 14.3.2 shows the employment impact of redirected residential spending made possible by appliance energy savings. In this case, the employment impact is strongly positive, increasing employment in the sectors that supply households with consumption inputs.

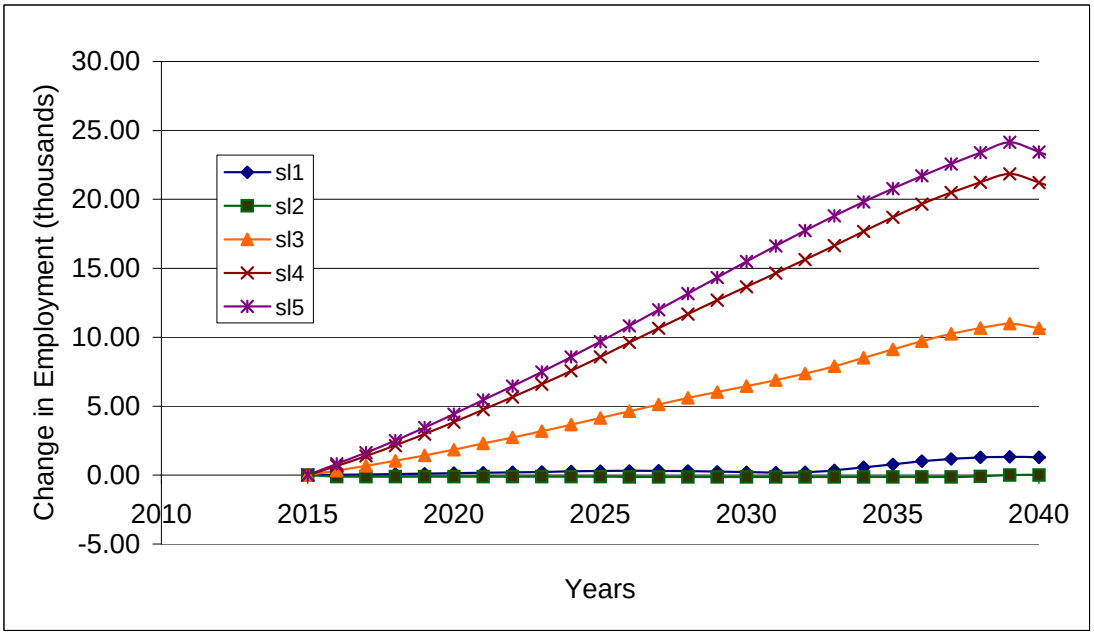

Figure 14.4.2 Employment Impact of Redirected Residential Spending

The change in employment resulting from decreased utility investment and the redirection of funds to other sectors of the economy is negligible. When consumers use less energy resources, energy utilities experience relative reductions in demand which leads to reductions in utility sector investment and employment. The effect on utility employment is small because the utility sector is capital intensive, and the employment per dollar utility revenue is relatively low. Use of these funds by other sectors of the economy tends to more than offset the utility employment impacts. There is no real effect on overall employment.

The energy savings for each of the fuel sources are shown in the national energy savings and net present value analysis (Chapter 10).

14.5 SUMMARY RESULTS

Figure 14.3.4 shows the estimated net national employment impacts of each trial standard level. These trial standard levels are discussed in greater detail in Chapter 10. Figure 14.3.4 shows, for any given year, the change in the number of jobs in the economy relative to the number of jobs if there were no change in standards (and thus no resulting change in spending and cash flow patterns throughout the economy). Table 14.3.1 shows the net national employment impact in specific years.

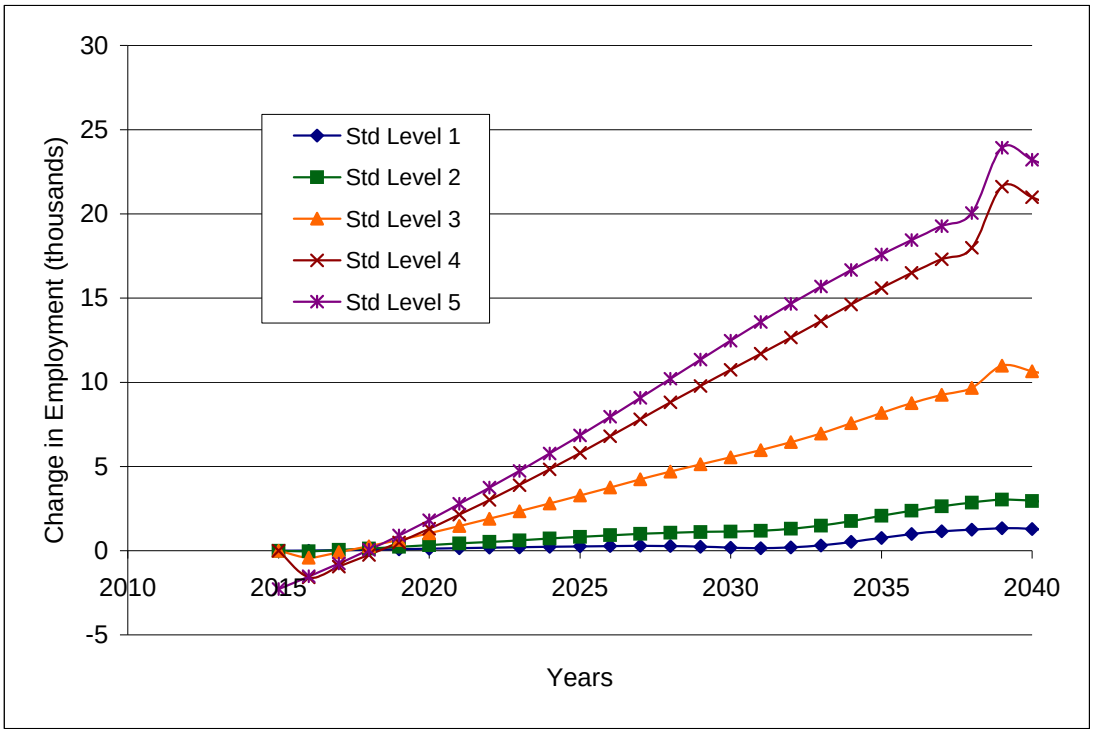

Figure 14.5.1 Employment Impacts of Furnace Standards

Table 14.5.1 Net National Change in Employment (thousands)

Trial Standard Level	2015 (thousands)	2020 (thousands)	2030 (thousands)	2040 (thousands)
1	0.00	0.12	0.18	1.30
2	0.00	0.33	1.14	2.96
3	0.00	1.05	5.55	10.65
4	0.00	1.30	10.75	20.99
5	-2.27	1.82	12.48	23.22

REFERENCES

1. Scott, M. J., D. J. Hostick, and D. B. Belzer. *ImBuild: Impact of Building Energy Efficiency Programs*. April, 1998. Pacific Northwest National Laboratory. Richland, WA. Report No. PNNL-11884. Prepared for the U.S. Department of Energy under Contract DE-AC06-76RLO 1830.

2. Minnesota IMPLAN Group Inc. *IMPLAN Professional: User's Guide, Analysis Guide, Data Guide*. 1997. Stillwater, MN.