

CHAPTER 15. EMPLOYMENT IMPACT ANALYSIS

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CHAPTER 15. EMPLOYMENT IMPACT ANALYSIS

15.1 INTRODUCTION

The Department defines net national employment impacts from commercial clothes washer, conventional cooking product, and microwave oven efficiency standards as net jobs created or eliminated in the general economy as a consequence of: (1) increased spending on the purchase and installation of new appliances; (2) reduced spending on electricity, natural gas, and water; (3) reduced spending on new investment or capacity by energy companies; (4) changes in operation and maintenance costs; and (5) the associated indirect effects of the above.

15.2 METHOD

The Department based its analysis on an input/output model of the U.S. economy that estimates the effects of standards on major sectors of the economy related to buildings and the net impact of standards on jobs. The Pacific Northwest National Laboratory developed the model, ImSET¹ (which stands for Impact of Sector Energy Technologies) as a successor to ImBuild², a special-purpose version of the IMPLAN³ national input/output model. ImSET estimates the employment and income effects of building energy technologies. In comparison with simple economic multiplier approaches, ImSET allows for more complete and automated analysis of the economic impacts of energy-efficiency investments in buildings.

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., due to 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.

ImSET uses a 188-sector model of the national economy to predict the economic effects of residential and commercial buildings technologies. ImSET collects estimates of initial investments, energy savings, and economic activity associated with spending the savings resulting from standards (e.g., changes in final demand in personal consumption, business investment and spending, and government spending). It provides overall estimates of the change in national output for each input-output sector. The model applies estimates of employment and wage income per dollar of economic output for each sector and calculates impacts on national employment and wage income.

Energy-efficiency technology primarily affects the U.S. economy along three spending pathways. First, general investment funds are diverted to sectors that manufacture, install, and maintain energy-efficient appliances. The increased cost of appliances leads to higher

employment in the appliance manufacturing sectors and lower employment in other economic sectors. Second, commercial firm and residential spending are redirected from utilities toward firms that supply production inputs. Third, electric utility sector investment funds are released for use in other sectors of the economy. When consumers use less energy, electric utilities experience relative reductions in demand which leads to reductions in utility sector investment and employment.

15.3 RESULTS

The results in this section refer to impacts of commercial clothes washer, conventional cooking product, and microwave oven standards relative to the base case for each appliance. DOE disaggregated the impact of conventional cooking product, microwave oven, and commercial clothes washer standards on employment into three component effects: increased capital investment costs, decreased energy and water costs, and changes in operations and maintenance costs.

15.3.1 Increased Capital Investment Cost Impacts

Figures 15.3.1–15.3.4 show the employment impacts of the increased investment and spending on more-efficient equipment. Because appliance manufacturing is relatively capital-intensive compared to other sectors of the economy, the net result is a small loss of employment.

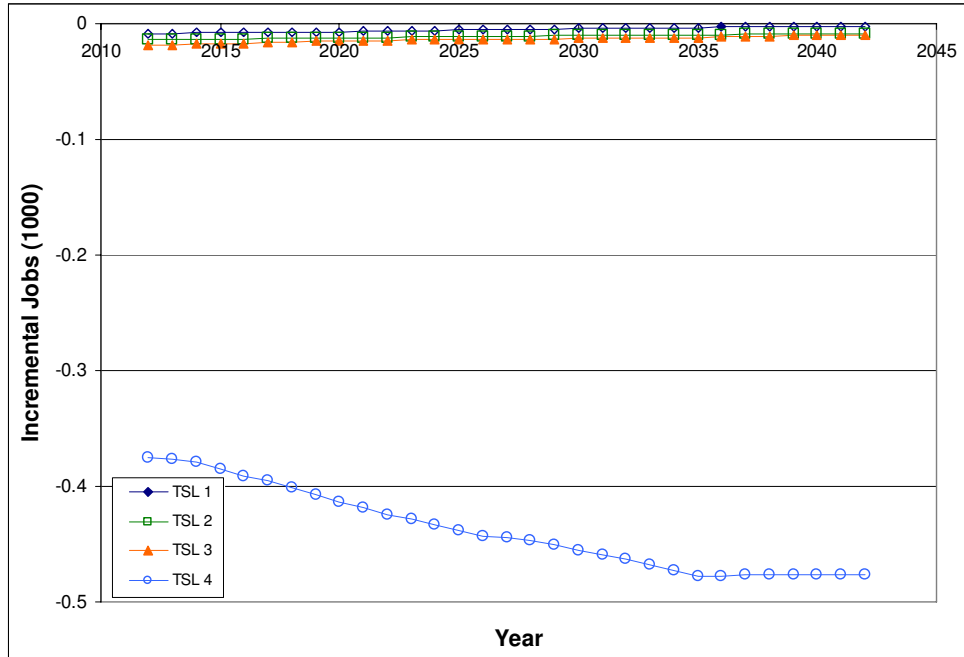


Figure 15.3.1 Conventional Cooking Products Employment Impact of Increased Equipment Cost

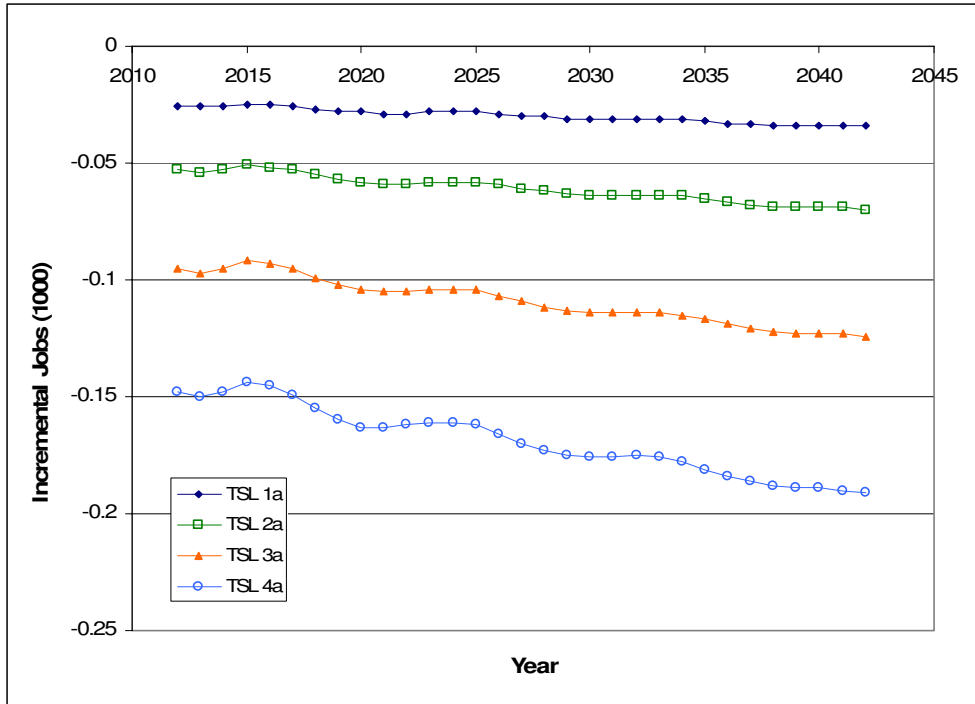


Figure 15.3.2 Microwave Oven EF Employment Impact of Increased Equipment Cost

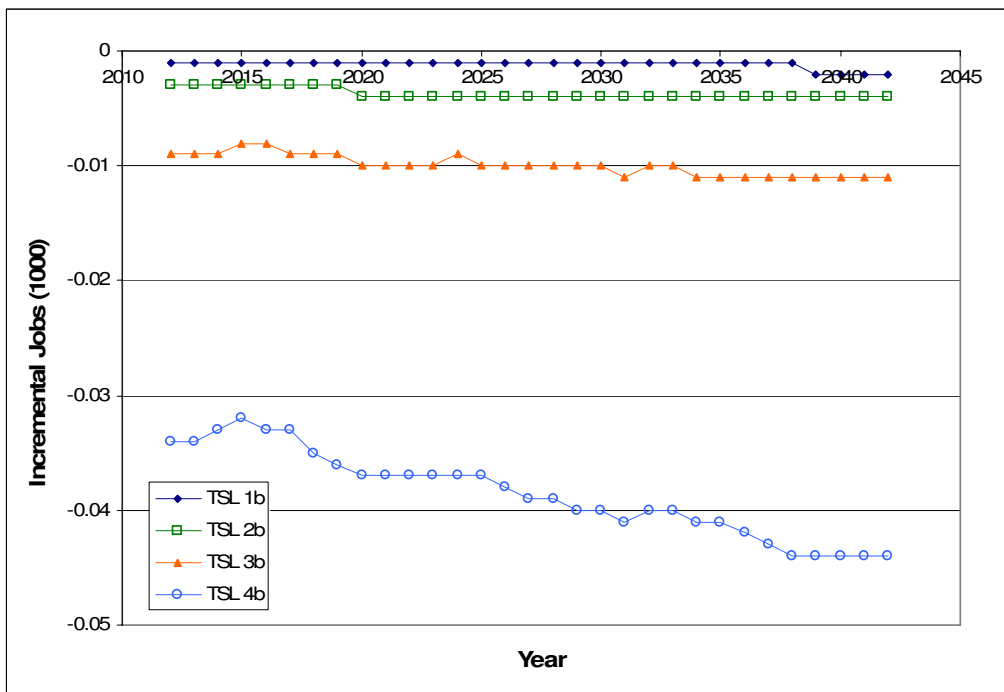


Figure 15.3.3 Microwave Oven Standby Power Employment Impact of Increased Equipment Cost

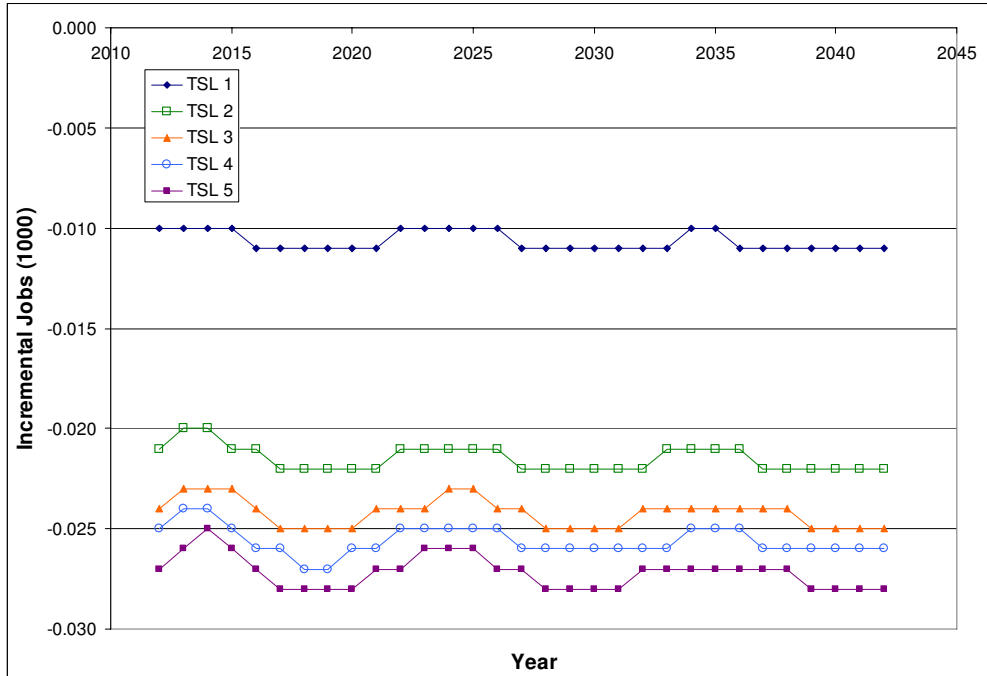


Figure 15.3.4 Commercial Clothes Washer Employment Impact of Increased Equipment Cost

15.3.2 Decreased Energy and Water Costs Impacts

Figures 15.3.5–15.3.8 show the employment impact of redirected spending made possible by appliance energy savings. In this case, the employment impact is strongly positive, increasing employment in the sectors that supply these firms with production, investment, or financial inputs. Due to an error in the distribution of water savings in ImSET, DOE adds the dollar value of water savings to electricity savings, as the cost multipliers and labor intensity of the water sector and the electricity generation sector are similar. This only affects the employment impact estimates for commercial clothes washer TSLs, since conventional cooking product and microwave oven TSLs only include natural gas and electricity use reductions.

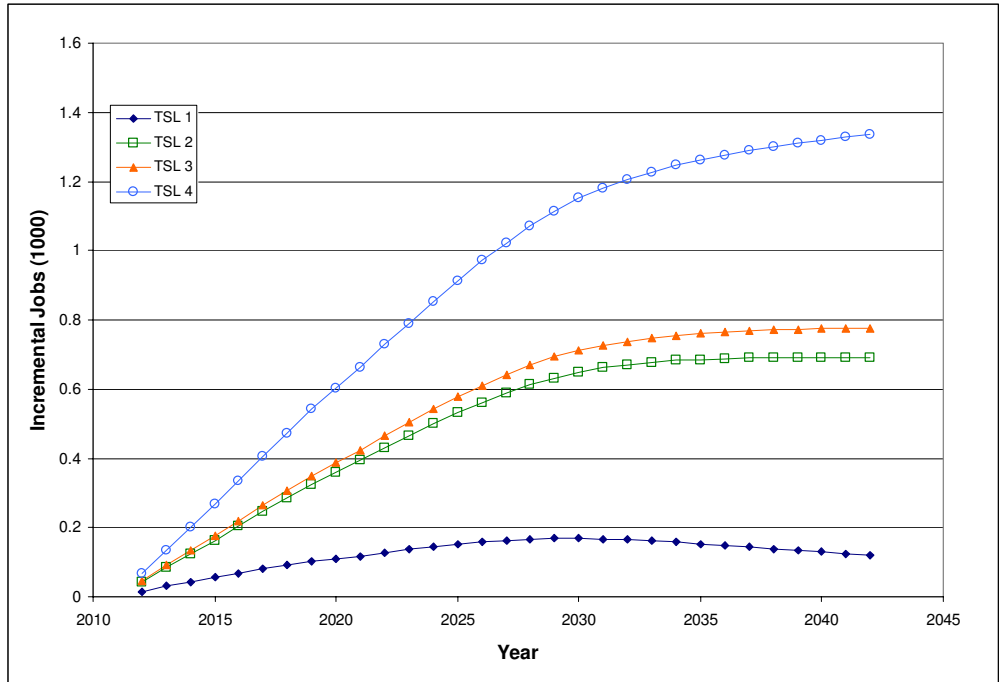


Figure 15.3.5 Conventional Cooking Product Employment Impact of Energy Savings

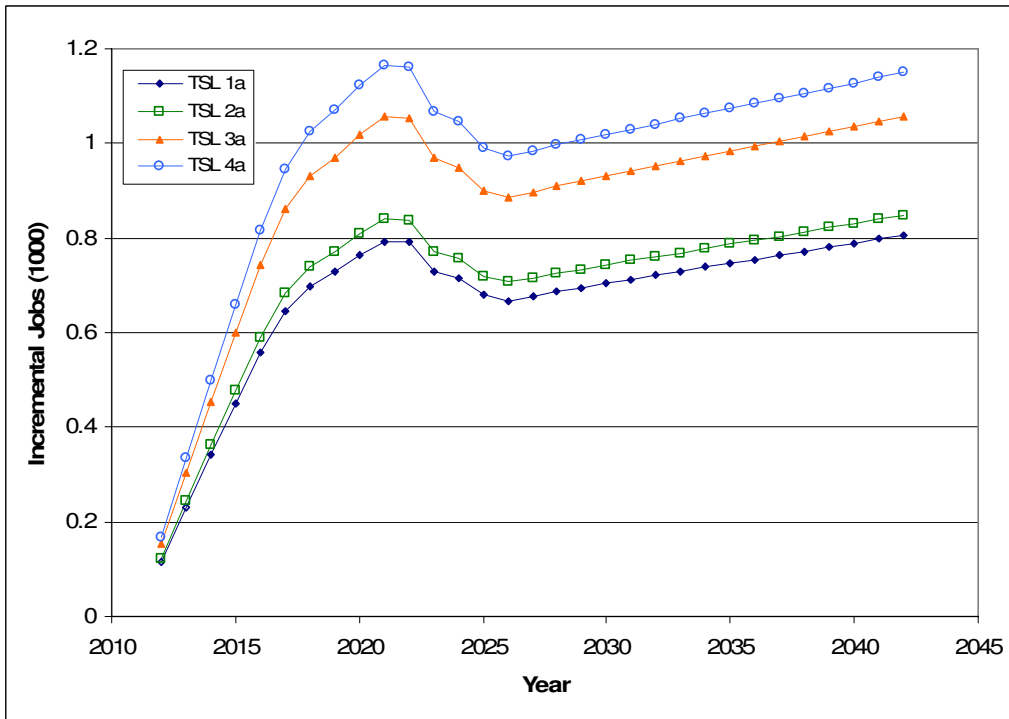


Figure 15.3.6 Microwave Oven EF Employment Impact of Energy Savings

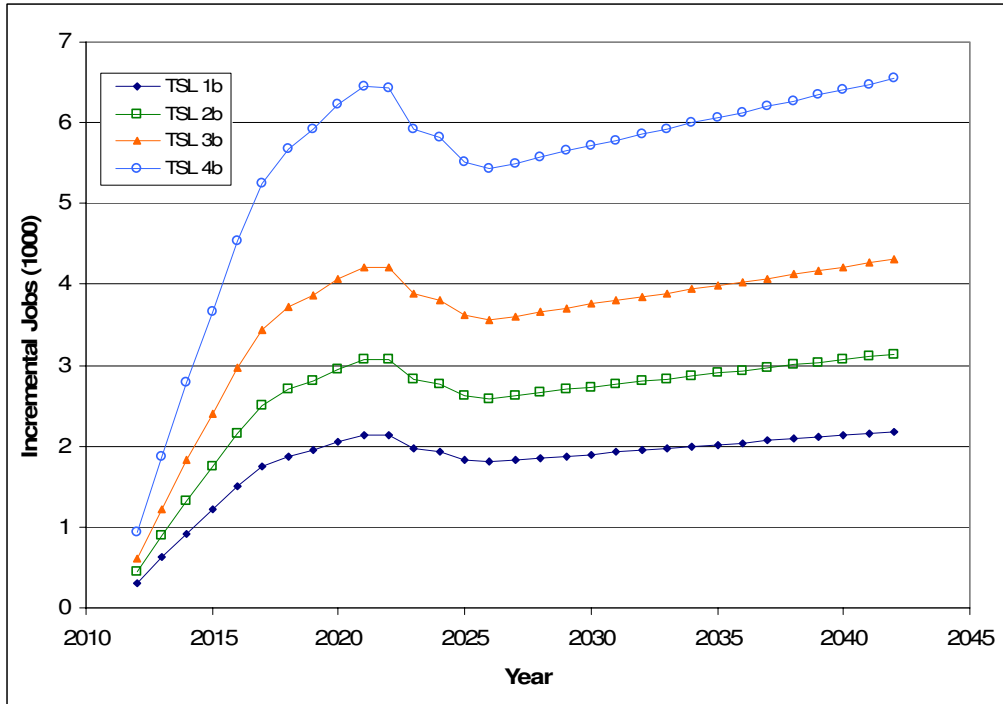


Figure 15.3.7 Microwave Oven Standby Power Employment Impact of Energy Savings

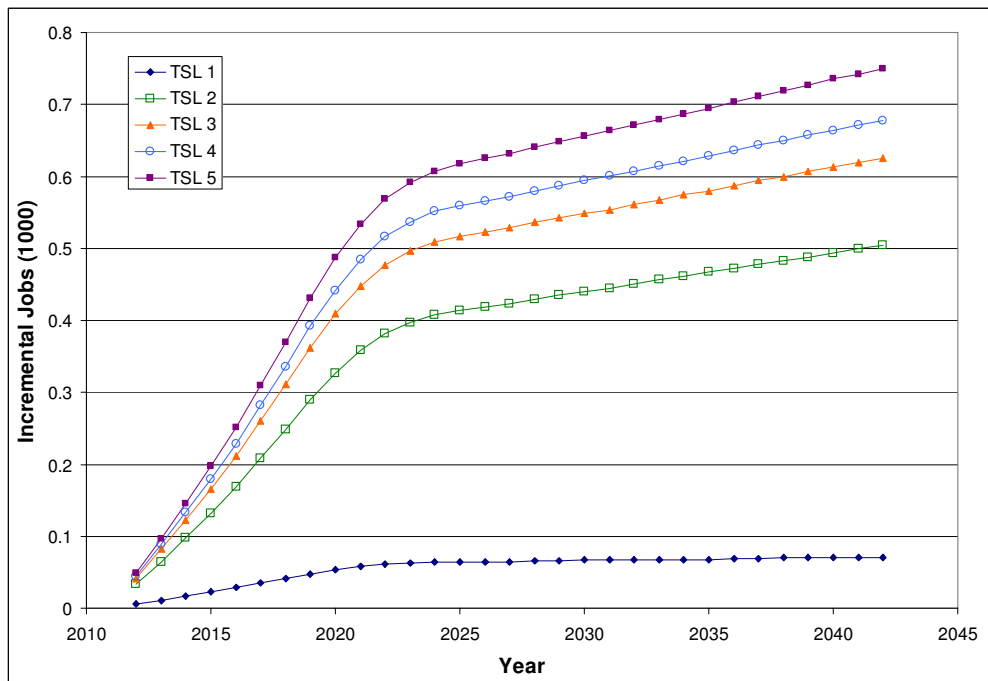


Figure 15.3.8 Commercial Clothes Washer Employment Impact of Energy and Water Savings

15.3.3 Changes in Operations and Maintenance Costs Impacts

Figures 15.3.9 and 15.3.10 show the employment impacts of non-energy operations and maintenance cost increases for commercial clothes washers and conventional cooking products. Operations and maintenance costs were estimated to be the same for all conventional cooking product TSLs. No operations and maintenance cost increase was estimated for microwave ovens. Repair and maintenance is comparatively labor-intensive, so the net result is a small increase in employment.

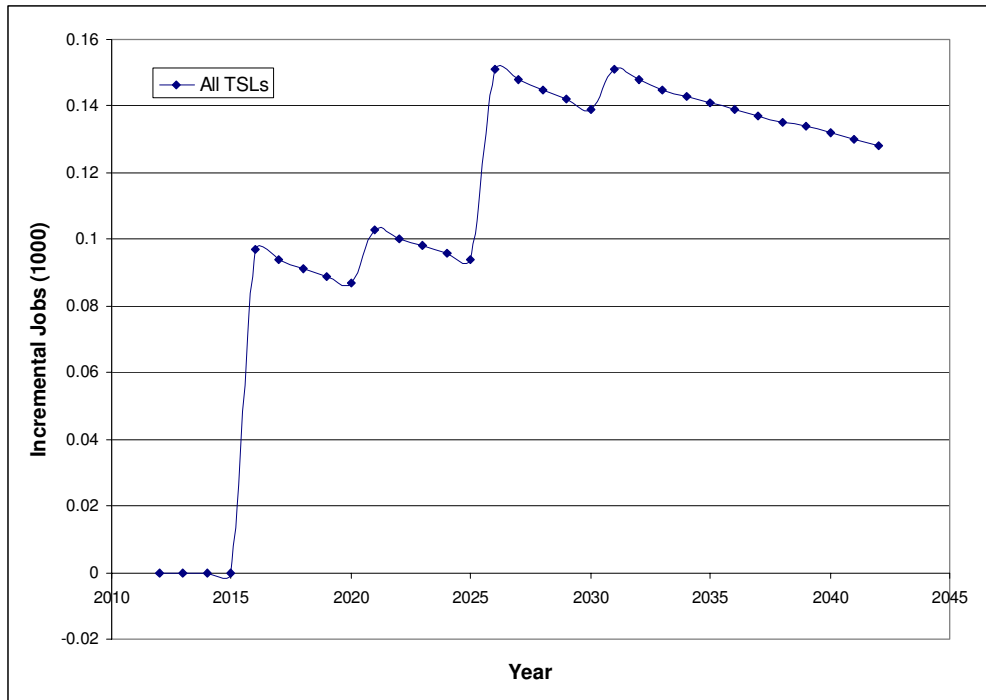


Figure 15.3.9 Conventional Cooking Products Impacts of Operations and Maintenance Cost Increase

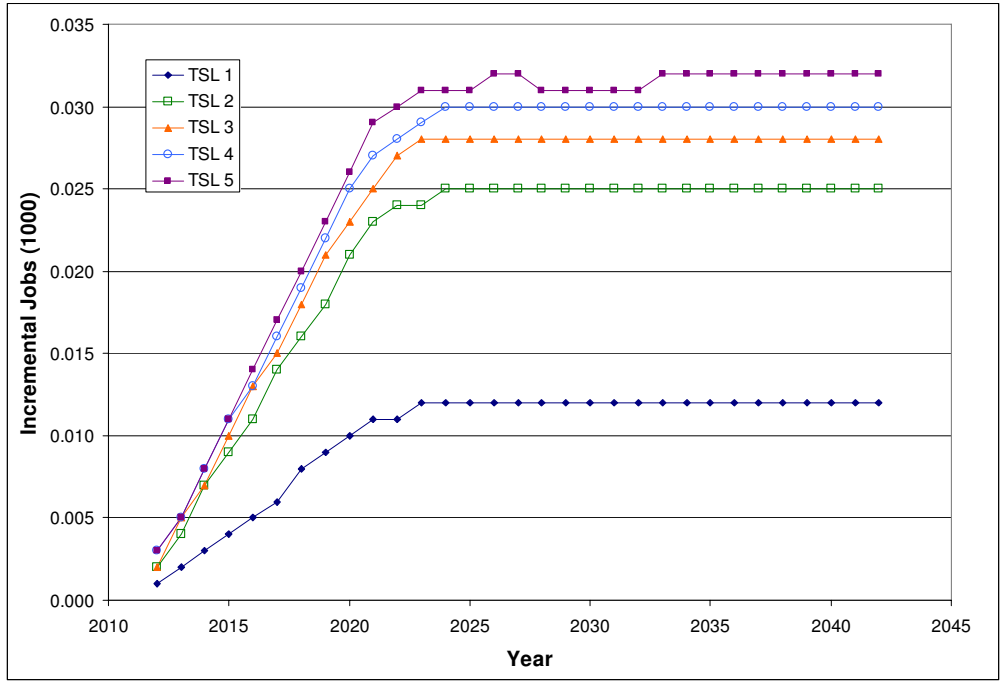


Figure 15.3.10 Commercial Clothes Washer Employment Impacts of Operations and Maintenance Cost Increase

15.3.4 Net National Employment Impacts

Figures 15.3.11–15.3.14 show the estimated net national employment impacts of the commercial clothes washer, conventional cooking products, and microwave oven trial standard levels. For any given year, these figures show the net change in the number of jobs in the economy relative to if there were no change in standards (and thus no resulting change in spending and cash flow patterns throughout the economy). Tables 15.3.1-15.3.4 show the net national employment impact in specific years.

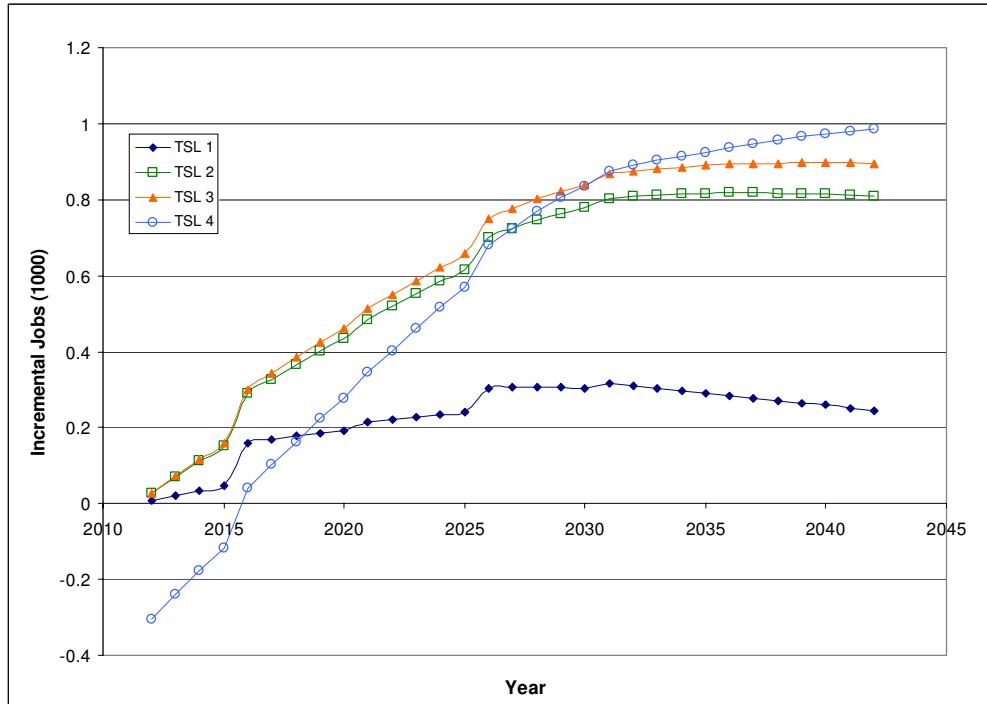


Figure 15.3.11 Conventional Cooking Products Net National Employment Impacts

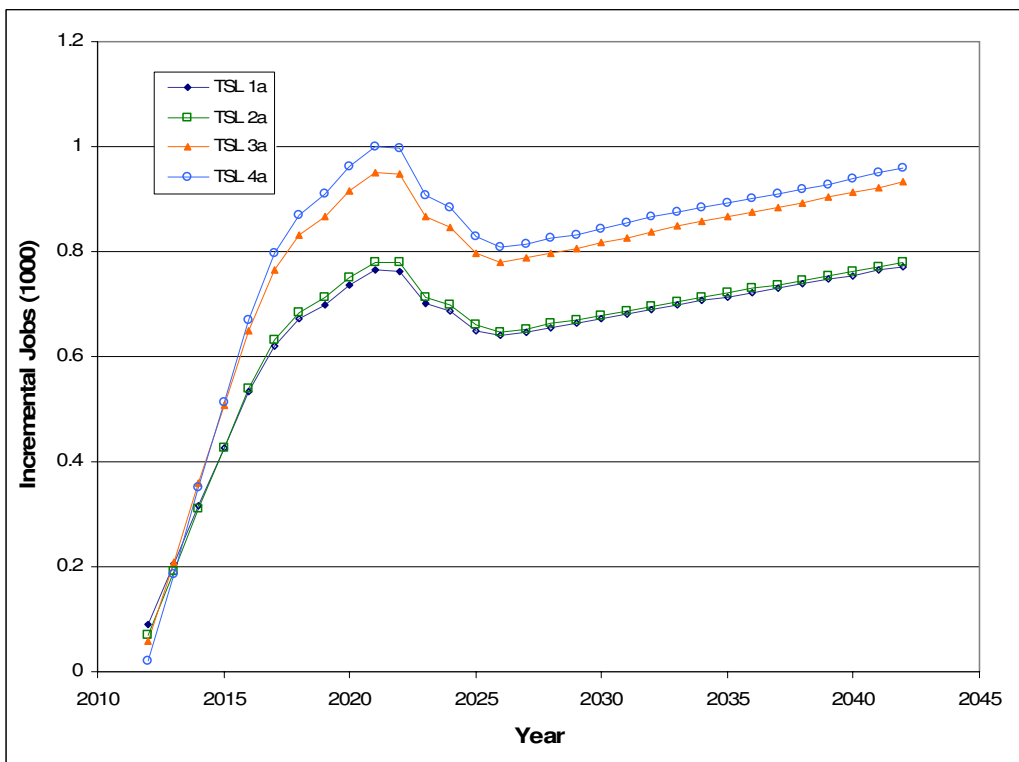


Figure 15.3.12 Microwave Oven EF Net National Employment Impacts

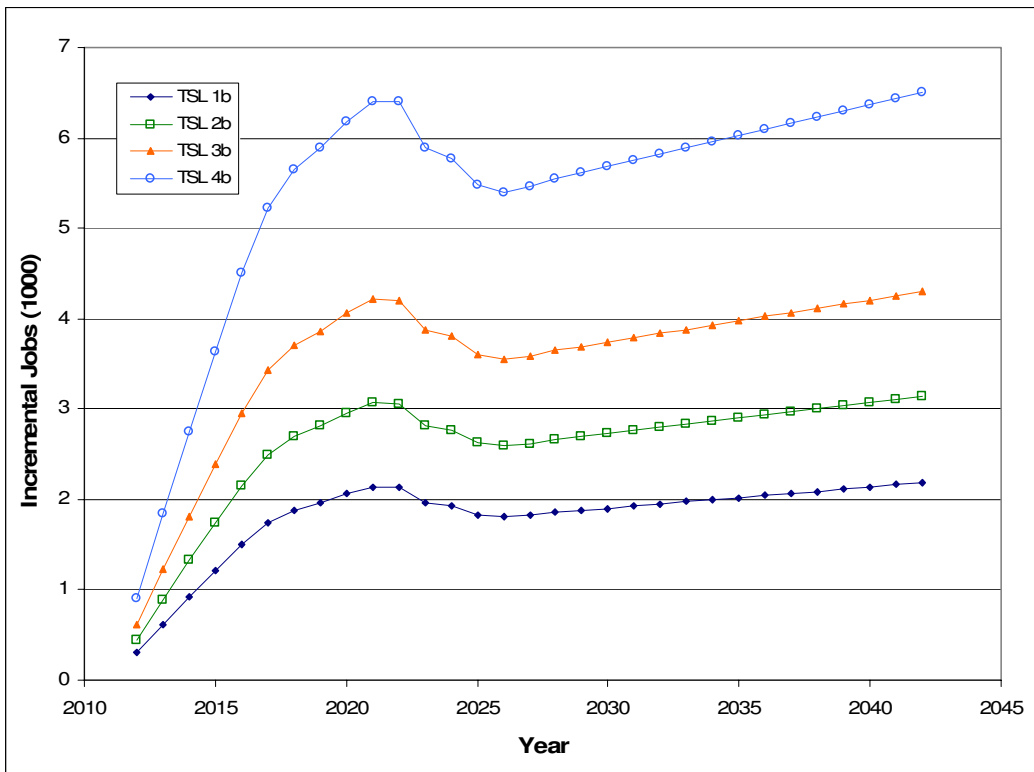


Figure 15.3.13 Microwave Oven Standby Power Net National Employment Impacts

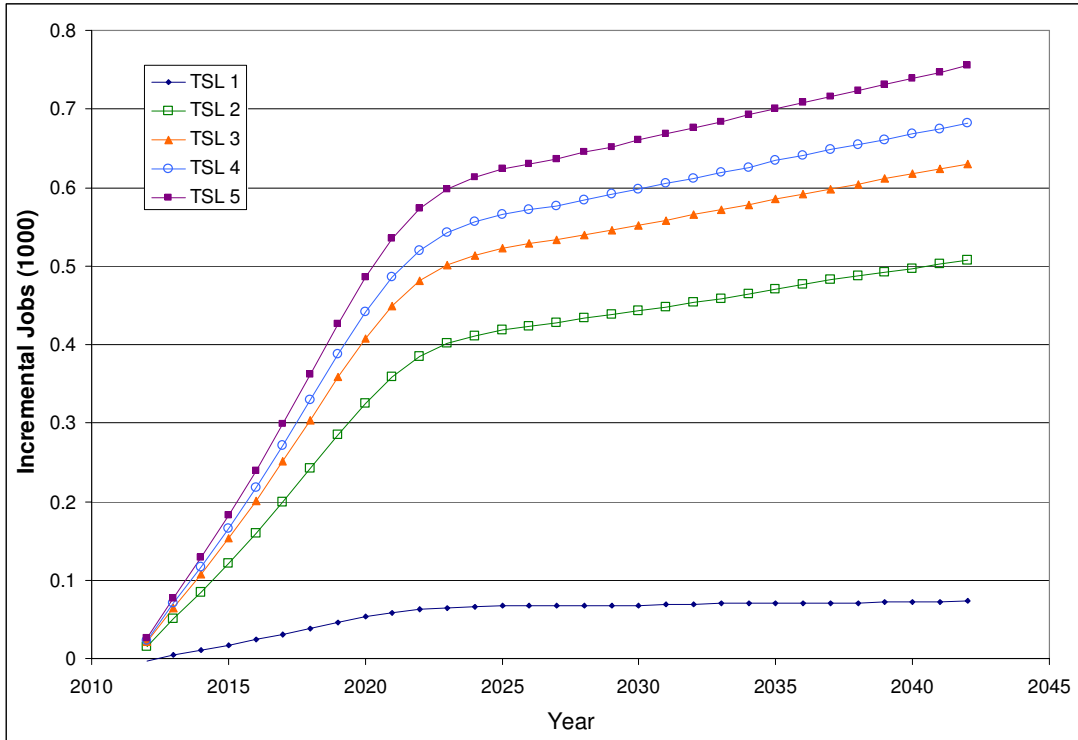


Figure 15.3.14 Commercial Clothes Washer Net National Employment Impacts

Table 15.3.1 Conventional Cooking Products Net National Change in Jobs

Trial Standard Level	2012 (thousands)	2020 (thousands)	2030 (thousands)	2042 (thousands)
1	0.01	0.19	0.30	0.25
2	0.03	0.44	0.78	0.81
3	0.03	0.46	0.84	0.90
4	-0.31	0.28	0.84	0.99

Table 15.3.2 Microwave Oven EF Net National Change in Jobs

Trial Standard Level	2012 (thousands)	2020 (thousands)	2030 (thousands)	2042 (thousands)
1a	0.09	0.74	0.67	0.77
2a	0.07	0.75	0.68	0.78
3a	0.06	0.92	0.82	0.93
4a	0.02	0.96	0.84	0.96

Table 15.3.3 Microwave Oven Standby Power Net National Change in Jobs

Trial Standard Level	2012 (thousands)	2020 (thousands)	2030 (thousands)	2042 (thousands)
1b	0.31	2.06	1.90	2.19
2b	0.45	2.96	2.73	3.14
3b	0.61	4.06	3.75	4.30
4b	0.91	6.18	5.68	6.51

Table 15.3.4 Commercial Clothes Washers Net National Change in Jobs

Trial Standard Level	2012 (thousands)	2020 (thousands)	2030 (thousands)	2042 (thousands)
1	0.00	0.05	0.07	0.07
2	0.02	0.33	0.44	0.51
3	0.02	0.41	0.55	0.63
4	0.02	0.44	0.60	0.68
5	0.03	0.49	0.66	0.76

REFERENCES

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- ³ Minnesota IMPLAN Group, Inc., *IMPLAN Professional: User's Guide, Analysis Guide, Data Guide*, 1997. Stillwater, MN.