APPENDIX J. IMBUILD MODEL.

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J.1 INTRODUCTION

This appendix provides a brief guide to the use of ImBuild, the 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.[1] ImBuild (which stands for Impact of Building Energy Efficiency Programs) is the model used in Chapter 15, Net National Employment Results, to estimate impacts of water heater efficiency standards on employment.

J.2 SPREADSHEET

The following are the steps for using the ImBuild model spreadsheet:

1. Open Excel.

2. Open two files in memory: **techs_1.xls** **imb98_1.xls**

When it asks you to enable macros, reply "yes."
When it asks you to reestablish links, reply "no."

NOTE: At some point in running the model, you will get an error if **techs_1.xls** is not open. You also need to have the **INLIB_1.xls** accessible (i.e., in the same subdirectory where you've opened the original **imb98_1.xls** file).

3. A model can be run by going to the cover sheet (i.e., the first worksheet) of **imb98_1.xls** and clicking on the START button.

4. It will then ask you for the forecast years that you want to forecast. Enter the years you want.

The deflators should be:

capital = 1
operations = 1
income = 1.144

[This will cause it to take the defaults of the model as originally used by PNNL.]

5. When it asks what results you would like to see, click on the button for "Effects of Financing" under "Graphical Employment."

6. When it asks if you would like to keep these results, these are the results that were saved fromthe last time the model was run. If you're doing new runs, the answer should be "no". Otherwise your new runs will be overlayed on the existing run.

Let's assume you enter, "no."

7. If you are doing a new series of runs and you want to keep the inputs for them, you can reply "no" to "Delete previous runs?"

Let's assume that you will delete previous runs so click on all the relevant boxes.

8. For "Run Title", enter the name that you want for the run. Use a simple, easily remembered name as you will need to refer to it later on. Enter the number and the title.

9. Enter the technology that you want to analyze. Generally, you will want to analyze a technology that we've entered and that's under "OTHER"

Adding New Technology:

10. If you're doing a new analysis, it often works best to input a new technology, so reply "yes."

Enter the name of the new technology. Again, this should be an easy-to-remember name as you will refer to it again later on.

11. It will then ask you whether or not the name of the technology is what you wanted. If so, reply “yes”.

When it asks whether or not you're satisfied with inputs for the technology (which if you've defined a new one, you won't be otherwise you're using the default for some other product analyzed by PNNL), it is at this point that you say "no" to enter the following inputs from the NES Spreadsheet data:

- Years. Which are the same as the analysis years you entered in Step Number 4.

NOTE: Gas and LPG need to be summed from the NES Spreadsheet into a “combined gas” category for the ImBuild runs.

- System Capital Cost Increase. The total additional incremental manufacturing costs (relative to the no-standards case) due to standards (e.g., the costs of the new water heaters) for the appropriate fuel type. This number should be positive if there are increased costs.

These numbers should be in millions of $.

- System Installation Cost Increase. The total additional incremental installation costs (relative to the no-standards case) due to standards (e.g., the costs of the new water heaters) for the appropriate fuel type. This number should be positive if there

are increased costs.

These numbers should be in millions of $.

- System Energy Cost Increase or Decrease. This is where you enter the $ energy cost savings. If there are savings due to standards (the normal case) then this number should be negative and in millions of $. If given in $bil and they need to be converted.

- System Non-Energy Cost Increases or Savings (e.g., this can happen if there are interactions, for example, between HVAC and lighting). For the most part, this should probably be zero.

- System Energy Saved. This is the energy savings in *trillions* of Btus. NOTE: The NES spreadsheet normally has this number in quads so a conversion is necessary.

When you're done, hit the [OK] button. The program will verify that you agree with the inputs.

Technologies:

12. Click on "OTHER"

The name of the technology should be the same as the one you entered in Step Number 10.

13. Percentage of Investment by Sector. For water heaters, this is 100% in Household Appliances.

Accept all further default entries until you get to Impact on Energy Sector Investments. To run the model with utility impacts, make sure the boxes are checked. Otherwise, uncheck them.

14. The model will then ask if you want to run it with these inputs that you've entered.

Answer “yes” and the model will generate results for the years you’ve input. Repeat for each set of years you want to analyze.

Note: The first year of each set of years analyzed is hard-coded as “1989" so if you are running analyses for multiple sets of years, you should discard the first year of any set. To maintain continuity, you should probably do overlapping years for the last year of each successive set.

REFERENCE

1. Pacific Northwest National Laboratory, *ImBuild: Impact of Building Energy Efficiency Programs,* 1998. Richland, WA. Prepared for the U.S. Department of Energy under Contract DE-AC06-76RLO 1830.