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November 18, 2014

**MEMORANDUM**

**TO: Council Members**

**FROM: Regional Technical Forum**

**SUBJECT: Technical Considerations around Quantifying the Health Impacts from Changes in Wood Smoke Emissions**

This memo reflects the Regional Technical Forum (RTF) perspective on the technical considerations involved in quantifying the health impacts from changes in wood smoke emissions that may be attributable to specific energy efficiency measures. The RTF recognizes that the ultimate question of whether health impacts resulting from a conservation measure should be included in RTF cost and benefit estimates is a question for the Council. The RTF analysis is intended to inform the Council’s decision, but stops short of answering, the question of whether this specific “benefit” satisfies the requirements of the Northwest Power Act. This memo summarizes RTF technical findings from a detailed staff technical report on a methodology for quantifying health impacts related to energy efficiency measures. In summary, the RTF believes that, given sufficient resources, a methodology exists to quantify the impacts from changes in wood smoke and that the resulting benefits (or costs) may be significant for certain energy efficiency measures.

**RTF Consensus Conclusions on the Methodology for Quantifying Health Effects from Wood Smoke**

The RTF analysis focuses on the technical considerations around a methodology used by the Environmental Protection Agency and other federal agencies to calculate the health impacts from changes in wood smoke emissions. The following subsections summarize RTF consensus conclusions around the methodology analyzed in the RTF Staff report. Generally, the RTF has the expertise to assess Step 1, but Steps 2 through 4 require expertise that is not a part of the current RTF Charter (members are not chosen for this type of knowledge and there are not research budgets or staff to conduct the work).

*Step 1: Quantifying Changes in Wood Use Resulting from an Energy Efficiency Measure*

* **There is a causal link between ductless heat pumps and wood use, as evidence shows that the introduction of a ductless heat pump offsets some supplemental wood use, on average.** For the ductless heat pump measure, the RTF accounts for the average wood reduction per heating zone in its savings and cost and benefit estimates. The RTF also accounts for wood reductions in this way for other HVAC and weatherization measures.
* **Wood use changes can be quantified and would need to be determined on a measure category basis.** Ductless heat pumps were used in the example given the robustness of the data supporting the energy savings estimates. The description of methodology demonstrates that each measure that interacts with the heating system (including those that could potentially increase the use of supplemental wood heating) would need to be assessed separately.

*Steps 2-4: Monetizing the Resulting Health Impacts*

* **If the Council finds that health impacts from wood smoke emissions should be a part of its cost effectiveness analysis, the RTF notes that there is a methodology used by EPA to quantify and monetize impacts and is accepted as best practice.** As a body, the RTF does not have sufficient expertise to develop a methodology for quantifying the health impacts (and as noted above, this is outside the current RTF charter). The RTF was generally satisfied with the technical underpinnings of the methodology used by EPA and other regulators.
* **A more sophisticated dispersion model would be required to be consistent with EPA methodology that accounts for locational impacts of emissions and partial-year effects.** The RTF staff used the Co-Benefit Risk Assessment (COBRA) model, which looks at emissions over a single year. EPA uses this as a screening tool only.
* **The monetized value of health impacts, for at least some measures, can be significant.** Based on the RTF Staff Report, The ductless heat pump example shows that the potential health impacts are significant (the estimate benefits per unit of energy saved are on the same order of magnitude as the value of conserved electricity).

**RTF Feedback on Technical Issues Raised by the Ductless Heat Pump Example**

*Reliability of Existing Estimates for Quantifying Changes in Wood Use*

The RTF estimates of energy savings and wood smoke reduction resulting from the ductless heat pump measure rely on one of the RTF’s most robust measure analyses. Specifically, this analysis is based on a large sample (3,400) of billing data and set of metering data. The wood use change estimates for other RTF measures do not meet this same quality standard. That being said, if asked, the RTF at this time does not have a consensus position as to whether the ductless heat pump analysis is sufficient for quantifying changes in wood smoke.

If the Council determines that such health impacts should be included in future cost effectiveness analyses, the RTF suggests weighing the following considerations when determining the appropriate level of precision to quantify energy efficiency related wood use reductions:

* **Account for differences within specific heating zones.** The RTF developed its current wood use estimates based on heating zone. Health impacts, however, are very sensitive to geographic variations in wood consumption and population density. Differences in wood consumption and population density should be considered when attempting to quantify the directly attributable health impacts of changes in wood use.
* **Use of control groups would help to account for outside drivers**. Wood use is volatile and is not necessarily tied to an energy efficiency decision. Therefore, control groups to account for outside drivers (such as burn bans) would ensure a more robust analysis.
* **A more sophisticated dispersion model may require more granular inputs.** The RTF did not spend any resources to investigate the data input requirements of the more sophisticated tools used by the EPA. It is reasonable to assume that they may require more granular data inputs at the county level.

*Resources Requirements*

The RTF spent approximately $100,000 on the analysis to date, plus used an additional 10 hours of RTF meeting time to review work. This does not include the resources that went into collecting the initial billing and interview data about ductless heat pumps. Further assessment will be required to understand the relationship between wood use and the installation of an energy efficiency measure. There would also need to be regular studies to understand wood use changes. The required resources are likely beyond just Council and RTF resources.