April 04, 2023

MEMORANDUM

TO: **Council Members**

FROM: **Steven Simmons**

SUBJECT: **Overview of Potential New Load Forecast Tool**

BACKGROUND:

Presenter: Steven Simmons

Summary: This presentation will provide a high-level overview of the load forecasting methods used at the Council, and the project to identify and evaluate new tools to enhance our existing forecasting abilities.

The Council's 2021 Northwest Power Plan identified several dynamic changes taking place across the west that impact our power system. In particular, potentially significant increases in future electric loads, depending on the extent of building electrification, transportation, and other new demand such as hydrogen production. Given this dynamic change and the potential interactive effects, the 2021 Power Plan called on the Council to develop new load forecasting tools that would improve modeling of this interaction. In 2022, the Council embarked upon a project to explored new tools that could improve our long-term load forecasting. That project is now complete, and a new forecasting tool set has been identified which would fit the requirements.

Relevance: Per the Northwest Power Act, as part of its regional power plan, the Council is required to develop and include "a demand forecast of at least twenty years…". In addition to producing the long-term demand forecast,

data from the load forecast model is used to inform the energy efficiency and demand response potential assessments. The forecast is also a key input to many of the power planning models, including RPM, GENESYS, and Aurora.

Workplan: B.1.Tool Enhancement

Overview of Proposed New Load Forecasting Tool

Steven Simmons

April 12, 2023

Today's Discussion

1. Background – load (demand) forecasting and the Council
2. New tool evaluation and recommendation
3. Next steps

Context

The Northwest Power Act specifies that the Power Plan include a ***demand forecast of at least twenty years***

The forecast is then used to help evaluate what resources best meet regional needs, with an emphasis on conservation as a resource

Demand or Load Forecasting

Two general approaches to forecasting the demand for electricity through time

Econometric

An **Econometric Model** specifies the **statistical** relationship that is believed to hold between various economic quantities and weather to demand

End Use

An **End Use Load Model** – often called “bottoms up” modeling relies on summing up individual forecasts of demand for each electric end-use.

Load Forecasting at the Council

Long-Term Load Forecast ↔ End Use

- 20 + year load forecast, by state, sector, and end use by month
- Requires large, detailed data sets
- Can enable analysis for evaluating long term trends in growth, efficiency, electrification, technology

Short-Term Load Forecast ↔ Econometric

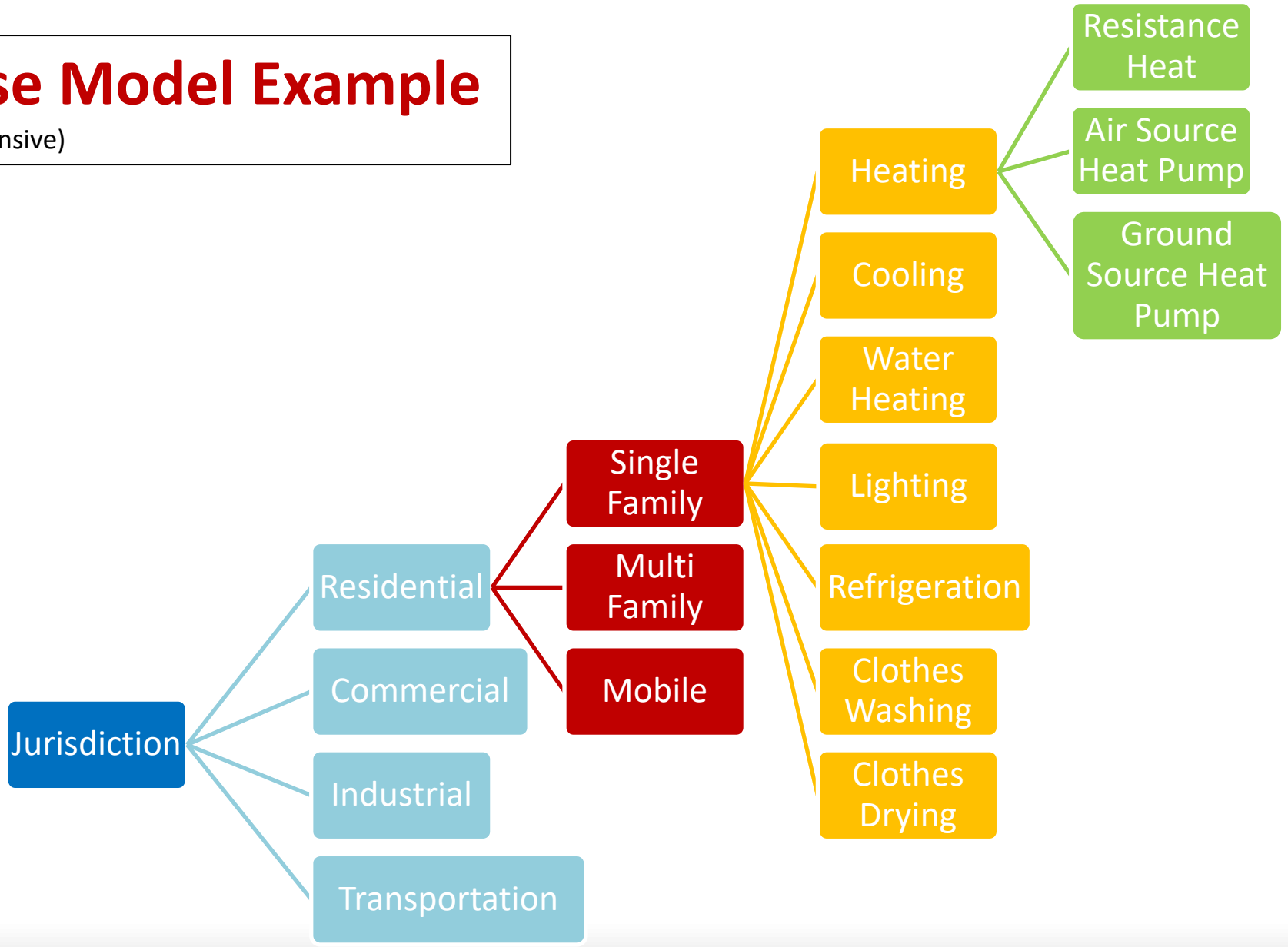
- Single year load forecast for a specific year typically within a 5-year window
- Less data intensive
- Is more tied to historic use patterns of existing technologies and behaviors for the region as a whole

Load Forecasts are used in many of our analytical and planning processes

1. Energy Efficiency Analysis
2. Resource Adequacy Assessments
3. Wholesale Price Forecasting
4. Capital Expansion Modeling

End Use Model Example

(not comprehensive)



New Tool Identification & Evaluation

- With increasing complexity in long term demand forecasting such as potential new load from electric vehicles and building electrification, increasing rooftop photo-voltaic installs, and the importance of load shapes – we felt it was a good time to update our forecasting tools
- Primarily we are looking for a tool that will facilitate a sustainable approach to load forecasting to support power planning well into the future. To achieve this the tool should have a graphical user interface, file management system, streamlined model structure, and strong technical support.
- As our other planning models have evolved–such as GENESYS - we also are looking for a finer spatial forecasting ability
- We engaged with a vendor on a project to identify and evaluate end-use forecasting tool options that would fit our needs and then ultimately make a recommendation

Next Steps

- This project was completed in March, and we have identified a tool suite with:
  - A more streamlined process that would allow more frequent forecast cycles
  - Both long term monthly end-use forecasting and hourly forecasting
  - Finer geographic granularity
  - Strong technical support
  - An established user base which will offer continued future engagement
- We will be back next month with a proposal
- Next steps would involve contracting, deployment, and training on a new tool - with a goal of completing an initial forecast by Q1 or early Q2 of 2024
- Results to be shared with the Demand Forecasting Advisory Committee
- Additional future work will be to identify and bridge any gaps between the new forecasting tool and integration with other planning processes

Delta Assessment of the Wind, White Salmon, and Klickitat Rivers (Bonneville Pool).

Northwest Power & Conservation Council – April 11, 2023

Bill Sharp, Research Scientist, YN Fisheries

Charles Seaton, CRITFC, Program Coordinator
Coastal Margin Observation and Prediction

<u>Presentation Outline:</u>

- Need for Assessments
- YN & COE- Technical Assistance Agreement
- Actions Taken – White Salmon Delta.
- CRITFC - NOAA-OCS & OSU Partnership

<u>Acknowledgments:</u>

YN Tribal Council, CTBWSR,CRITFC,
COE-Portland, NOAA-OCS, OSU, EPA

Klickitat River Delta at Bonneville Pool.