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January 7, 2020

DECISION MEMORANDUM

TO: Council members

FROM: Massoud Jourabchi
Manager, Economic Analysis

SUBJECT: Authorization to amend Contract C2020-25, ENERGY 2020 Model
Maintenance and Enhancements

PROPOSED ACTION: Staff recommends amending Contract C2020-25 to add specific tasks to customize and enhance the ENERGY 2020 model for use in scenario analysis and development of the 2021 Power Plan, and to add funds to the budget in consideration of the added tasks.

SIGNIFICANCE: The proposed action is necessary to enable staff to continue to enhance the ENERGY 2020 model for use in the development of the 2021 Power Plan.

BUDGETARY/ECONOMIC IMPACTS

Amending this Contract will add approximately \$79,111 to the original contract budget, for a total amended Contract budget not-to-exceed of \$104,016. Funds for this amendment are available within the Power Division budget for this fiscal year. Work could begin in mid-January 2020 and be completed by September 2020.

BACKGROUND

The ENERGY 2020 Model produces reasonable forecasts of the electricity demands of the region and has been used throughout the country by many states and utilities. ENERGY 2020 can provide electricity energy and load forecasts for a wide range of business sectors. Over the past two power plans. Council staff has used ENERGY 2020

to produce a wide range of load forecasts and to measure the future impact of a variety of scenarios. For the 2021 Power Plan, the Council contracted with Systematic Solution Inc. at the beginning of the fiscal year to update and enhance the modeling capability of ENERGY 2020; however, at that time, the full extent of the enhancements and tasks necessary for the power plan and scenario analysis were not known. Staff has now identified the additional tasks necessary for the power plan work.

ANALYSIS

Under this amendment, Contractor will perform the tasks identified in the draft statement of work, attached.

ALTERNATIVES

The alternative is to have the staff perform the enhancement and tasks on the model. However, this may cause a delay in the model updates and the model's availability for use in the development of the 2021 Power Plan, which could ultimately delay its development.

ATTACHMENTS

Draft statement of work

Draft statement of work

Residential Shell Efficiency

Incorporate Shell efficiency for the residential sector (this work already is in the code, but needs activation and review). NWPCC will provide values for the revised building code. SSI will incorporate these values into a text file. SSI will review/debug the results, send to NWPCC for review, and address comments from NWPCC.

Upstream Methane Emissions

Incorporating upstream Methane Emissions (data was sent by Steve, needs to be incorporated into the model, if it is not already). Email from Massoud on Tue 12/24/2019 12:20 PM - We need to include upstream emissions of methane, since our emission calculations are load based. This can be done by bumping up the emissions from natural gas by 25% percent. Steve will let you know if this not correct. SSI will increase the methane emissions coefficient by an amount equal to 25% of natural gas GHG emissions from ALL GHG pollutants. SSI will review/debug the results, send to NWPCC for review, and address comments from NWPCC.

Greenhouse Gas Cost Tipping Point Scenario

Run Price-effect load forecast (Price Effect forecast is Base Case with Secondary impact of climate change without Freezing Efficiencies), with different carbon tax passed through to consumers. This scenario would need to be developed more. The range of CO2 tax needs to be identified. NWPCC will clarify the scenario. SSI will develop the files and changes to the model required to simulate the scenario. The current estimate is 40 hours, but this may need to be refined once the scenario is clarified.

Commercial and Residential Modules

SSI will enhance and update commercial and residential modules. The first task is updating commercial sector drivers (XGOs) based on new data from surveys. The second task is updating lighting cost and efficacy for both commercial and residential sectors. The third task is to incorporate any changes to device efficiency standards based on marginal sales per units (this may require code changes). SSI will review/debug the results, send to NWPCC for review, and address comments from NWPCC.

2017 SEDS Data Calibration

SSI will incorporate latest 2017 SEDS data into the model and calibrate the model with the new data. SSI will review/debug the results, send to NWPCC for review, and address comments from NWPCC.

Pathways to Decarbonization Scenario

Goal is to have the regional CO2 Emissions by 2040 to be 50% less than 1990 emission levels and 2050 emission levels 80% less than 1990 emission levels. The current estimate is 160 hours, but this may need to be refined once the scenario is clarified.

Plug-In Electric Hybrids Fuels Used

SSI will review/debug issues with fuels used by plug-in electric hybrid vehicles from LDV and LDT vehicles. SSI will send the results to NWPCC for review and address comments from NWPCC.

Building Standards Code

NWPCC is sending a new set of building standards (PEStd) to be incorporated into the residential sector. SSI will incorporate these building standards into the model. SSI will review/debug the results, send to NWPCC for review, and address comments from NWPCC.

Pollution - Washington Transportation GHGs

SSI will review and update the documentation of the how energy and non-energy emissions are calculated. SSI will incorporate any comments from NWPCC.

Electric Vehicle Capital Costs Policy

SSI will debug issues with vehicle capital costs, sent by NWPCC, especially for electric/PHEV LDT. These new capital costs will then be incorporated into the base case. SSI will review/debug the results, send to NWPCC for review, and address comments from NWPCC.

Solar Capacity Jumps in 2018

SSI will debug issues identified by NWPCC related to solar capacity in the forecast. SSI will send the results to NWPCC for review, and address comments from NWPCC.

Solar plus Battery

NWPCC will provide feedback on the output files which need to be included and which ones can be removed. SSI will make these changes to the output files. SSI will review/debug the impact on minimum loads in the Solar plus Battery scenarios especially after 2040. This will include the construction of an output file using ENERGY 2020 conventions which displays the relevant variables. SSI will review the results, send them to NWPCC for review, and address comments from NWPCC.

Pollution Calibration to Historical Inventories.

SSI will prepare a summary of the differences between the model emissions and the state inventories of emissions. SSI will note where lack of support material for the state inventories limits the explanation and/or adjustment of the model results. SSI will discuss with NWPCC whether to adjust the energy demand or coefficients in the model or accept the differences with the state inventories. Apparent issues exist in the feedstock emissions and the emissions in the natural gas utility, coal mining, and petroleum industries especially in Montana.

Output Files

SSI will incorporate and debug a set of output files which are consistent with the ENERGY 2020 conventions. This will greatly reduce the time required to debug issues with the model and forecast. SSI will revise or add to the output files in response to feedback from NWPPCC.

Natural Gas Load Forecast

SSI will develop procedures and revise code as needed to calibrate the historical natural gas (SDUC/XSDUC). SSI will review the results, send them to NWPPCC for review, and address comments from NWPPCC.

California Load Forecast

SSI will calibrate the California loads to the latest historical/forecast data. SSI will develop an output file and spreadsheet which compare the model results to California data for electricity and natural gas demands.

General Support

SSI will provide support for any tasks requested by NWPPCC.

Estimated Hours and Budget

		Hours	Budget
1.	Residential Shell Efficiency	8	\$1,241
2.	Upstream Methane Emissions	8	\$1,241
3.	Greenhouse Gas Cost Tipping Point Scenario	50	\$7,756
4.	Commercial and Residential Modules	24	\$3,723
5.	2017 SEDS Data Calibration	40	\$6,205
6.	Pathways to Decarbonization Scenario	200	\$31,024
7.	Plug-In Electric Hybrids Fuels Used	8	\$1,241
8.	Building Standards Code	12	\$1,861
9.	Pollution - Washington Transportation GHGs	8	\$1,241
10.	Electric Vehicle Capital Costs Policy	12	\$1,861
11.	Solar Capacity Jumps in 2018	8	\$1,241
12.	Solar plus Battery	12	\$1,861
13.	Pollution Calibration to Historical Inventories	16	\$2,482
14.	Output Files	16	\$2,482
15.	Natural Gas Load Forecast	16	\$2,482
16.	California Load Forecast	32	\$4,964
17.	General Support	40	\$6,205
	Total	510	\$79,111