Updates to CTAM and the CTAM Energy Forecast for 2016 (September 2016)

1. Incorporated the new Energy Information (EIA) 2016 Annual Energy Outlook (AEO) Pacific region energy consumption and energy price forecasts.
2. Updated the proration table which is used to estimate the WA share of the AEO Pacific region energy consumption forecast.
3. Added the 2014 EIA State Energy Data System (SEDS) data to the proration table.
4. Checked previous SEDS data for EIA “true-up” of consumption values.
5. Added pipeline natural gas to industrial gas sector consumption in the proration table.
6. Adopted a 5 yr. averaging period in the proration table to better reflect recent changes in population shares, economic activity, energy policies and energy intensity in the different states of the AEO Pacific region energy and price forecast.
7. Incorporated the Northwest Power and Conservation Council 7th Power Plan electricity forecast, 2014 Dept. of Commerce Fuel Mix Disclosure emission profile, and EIA updates in the electric sector forecast tabs.
8. Updated the Colstrip and Centralia power plant generation numbers. Previously CTAM relied on single yr. generation values. Centralia now relies on a 10 yr. generation average. Colstrip, where output is more stable, relies on a 5yr average of WA utility FMD claims on generation.
9. Added an exogenous adjustment (option 8) for the recent PSE Colstrip 1 & 2 closure agreement - net change is small. Note that Pacific Corp component of Colstrip 3 & 4 generation relies on the company’s use of the FMD market purchase option. This slightly factor undercounts electric sector CO2 emissions.
10. Corrected an error in the electric sector calculations. Previously the percent increase in fuel cost caused by a carbon tax for natural gas, coal and petroleum fueled thermal power plants was applied to the entire levelized cost of power production. The percent increase in cost now applies to just the fuel inputs. The result of this correction is a lower overall increase in electric prices, and a smaller emissions reduction in the electric sector for a given carbon tax.
11. Added a five state population forecast table which is used to adjust the prorated future WA share of the AEO Pacific region energy of forecast. The WA population share of the Pacific region increases relatively about 4.4% during the course of 2012 to 2040 – one of the factors that produce the upward sweep in the gross CO2 emission curve in the CTAM dashboard from 2030 to 2040. This correction factor will be refined during future CTAM updates.
12. Confidential EIA derived adjustment for CA AB32 emission reduction activities. Much of the EIA adjustment is in the electric sector. CTAM does not rely on the EIA electric forecast and so the electric sector adjustments are not incorporated.
13. The EIA inspired AB32 adjustments in the model: add a bit of natural gas consumption to all sectors (not added to elec. sector because of unique way we handle it in CTAM). Added the AB32 adjustments for motor gas and distillate increase as well. This required modifying the previous CA Low Carbon Fuel Standard (LCFS) adjustment process used in the previous version of CTAM: see below.
14. There are two options for adjusting for the impact of the CA LCFS on the Pacific region motor gas and distillate consumption:
	1. The original approach (now controlled in the “Adjust factor” tab) and the EIA inspired approach (found at the bottom of Consumption tab).
	2. Use only one adjustment – there are Yes/No toggles for each on option. The original approach for adjusting for the LCFS likely adds too much motor gas and distillate back into the Pacific region. LCFS compliance is primarily achieved by substituting sugar cane or cellulosic for corn ethanol in motor gas that is already in gasoline, and by using a superior biodiesel product on the distillate side. The biofuel volumes aren’t changed, just substituting with lower Carbon Intensity biofuels.
	3. We recommend using the EIA derived LCFS correction: an average 2015-30 fuel use correction of 1% versus 4% for the previous LCFS correction approach.
15. Adjustment of process emissions by population growth, not income growth as was the case in the previous version of CTAM. Process emissions were increasing too fast in prior CTAM forecasts. Consider option of freezing at 2012 levels as these emissions should reflect manufacturing activity, not population growth, certainly not income growth.
16. CA gasoline prices are higher (relative to WA) in 2015 and 2016 which is affecting the price adjustment for gasoline and diesel; see adjustment at bottom of the price of forecast tab. This may be due to the long-tern refinery closure in 2014, and possibly from recent CA refinery problems.
17. Used Clean Power Plan EIA Reference case. This doesn’t alter the Pacific region forecast significantly. Future work - evaluate change in coal/nat. gas power generation in Mountain region. Anticipate long-term reduction of emissions associated with imported electricity due to the adoption of the CPP (consumption based accounting).
18. In the CTAM model itself, the heat rate trend for natural gas power plants in the electric section of the Baseline consumption tab were changed. Efficiency improvements to nat. gas plants are very small now, and fleet improvement from gas plant turnover will be very slow. A California Energy Commission reference on heat rate improvements in the existing NG CCCT fleet showed essentially no change over the last 10 yrs. The overall natural gas generator heat rate in CA for this period did change due to the retirement of older, inefficient NG steam turbine generation units – the PNW does not have these types of generators. This change in forecast NG CCCT heat rates increases the forecast electric sector emissions and carbon tax liability.
19. Did not add dashboard adjustment for the WA road fuel tax increase of 2016 (did so in 2015). EIA should now be aware of the tax increase, and consequently they should be incorporated in the baseline forecast.
20. Updated energy prices dollars to 2015 dollars. In addition, Dept. of Revenue has collected more up-to-date tax info which will be incorporated into CTAM.
21. Note that relative to the initial 2015 version of CTAM several calculation corrections were made. Model errors were noted by two outside CTAM users and incorporated by June. Internal review also uncovered three shortcomings of the model: a less than optimal use of an elasticity factor, an incorrect calculation of a proration factor, and the inclusion of lease and plant fuel natural gas consumption in the WA industrial sector. This subcategory represents energy used near the extraction point for natural gas and petroleum – activities that do not occur in WA.