

Inputs	Scripts	Description	Outputs	Feeds into
Transmission Lines and Capacities. <i>OBS: no data for this now! Need to update for region, e.g. using IPM data</i>	TransmissionLineFuncs	Imports data	Transmission line source, sink, capacity	CE Model
Reserve Types + ?? from ??? + Michael's Storage Paper	RIPSMaster (DefineReserve...)	Sets parameters used to compute reserves, which are determined in CE + UC models	Parameters for computing reserves	CE pre-process <i>OBS: Don't have operational reserves in CE model since there are no unit commitment constraints. Will use this for CE model.</i>
Fuel Prices from EIA AEO + EPA IPM	RIPSMaster	Imports Fuel Prices	Fuel Prices	CE + UCED
Generator Fleet from EIA 860, Needs, eGrid, PHORUM and AEO + IPM	SetupGeneratorFleet	Sets up generator fleet. Starts with NEEDs fleet, then adds emission rates (eGrid), cooling techs + sources (EIA 860), lat/long (eGrid), Var O&M + Fix O&M (AEO + IPM), unit commitment parameters (PHORUM), fuel prices, a random operational cost added (to expedite solution of optimization) + eligibility to provide regulated reserves. Script also combines plants of certain types (for computational efficiency)	Generator Fleet	CE + UCED
CO ₂ cap	InterpolateCO2Cap	Sets CO ₂ cap based on input limits	CO ₂ cap	CE
Hourly Zonal Demand	ForecastDemandWithRegion	Computes hourly demand by zone given Francisco coeff + future met data from UW	Hourly Demand	Selectweeks... (Demand- FuncCE)

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New plant types for construction (see SI of storage paper for sources)	ImportNewTechs	Tech data compiled already in Excel from variety of sources. Script imports data, then modifies plant costs per particular cooling type with IECM data. Also filters particular plant types given inputs	Plant Types able to be built in CE	CE
Hourly Capacity Factors (CFs) of renewables from NREL (Wind data set + Solar Integration data set, both from NREL) <i>OBS: should update solar to NSRDB with PVLib - Michael has downloaded NSRDB data + code for PVLib is in Solar ??? folder</i>	GetRenewableCFs	Get hourly CFs for wind + solar by zone by: 1. 'ID-ing' best wind sites 2. Getting hourly CFs for these sites 3. Replacing wind/solar in zone with best wind/solar sites until capacity zero'd out	Hourly wind + solar CFs + metadata for plants to which those CFs correspond	GetNetDemand → (<i>script combines all plants + CFs into single hourly max gen profile for all wind + solar, which is input to CE + UCED</i>)
Hourly Capacity Factors (CFs) of new wind + solar that CE can build	GetRenewableCFs	Relies on GetRenewableCFs scripts to determine CFs for any incrementl (5 GW now) amount of capacity to existing wind + solar capacity. All wind + solar added by CE have that same avg CF profile.	Hourly CFs for all new wind + solar plants	CE

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Curtailments of existing (already in fleet) thermal plant duw to ambient con- ditions + regulation based on UW data, Aviva coeffi- cients + regulation limit	RIPSMaster (importHourlyThermalCur..)	For each grid cell from UW: 1. Import meteo + water data 2. For each gen in cell: (a) set coefficients (Aviva) (b) calculate curtail- ment from: i. ambient con- ditions (Aviva regression) ii. regulations (based on mixing eqn in word doc)	Hourly time series of cur- tailments os each plant	GetHourlyCapacsForCE

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Hourly Zonal Demand (takes in demand computed with Francisco data)	DemandFuncsCE	<p>Selects periods to include in CE model. Those inputs are:</p> <ol style="list-style-type: none"> 1. The day with peak net demand 2. The day with peak thermal curtailment 3. The day with peak demand and thermal curtailment (these three items are the "special days") 4. Factoring out those days, representative days per season. These days are selected on the basis of minimizing the RMSE between their load duration curve (LDC) and the season's LDC. <p><i>You should explore other types of "special days". Also, analyze correlation between demand and curtailments.</i></p>	Demand (+ renewable generation) for days to be included in CE	CE