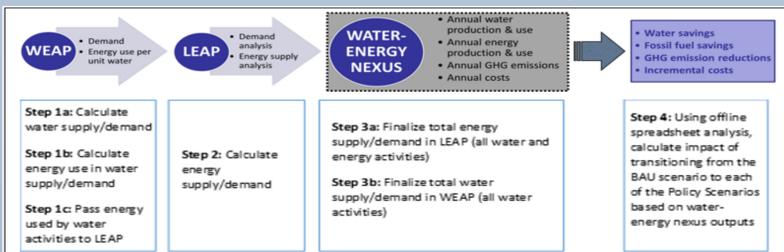


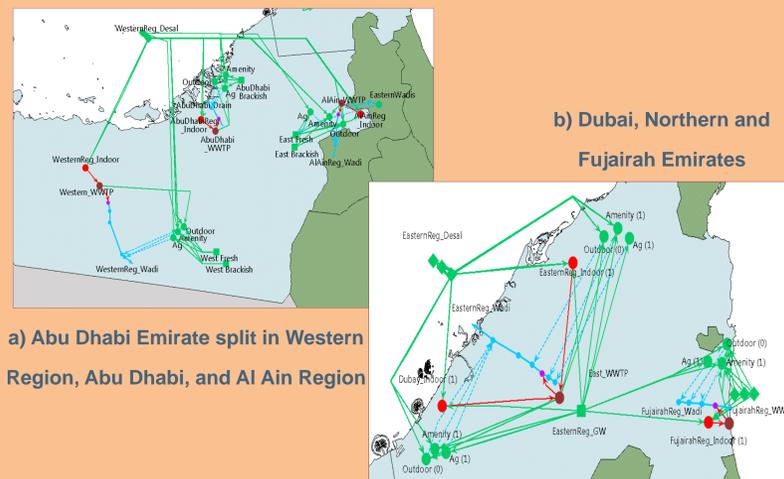
Yates¹, D.; Flores-López, F.²; Galaitsi³, S.; Dougherty⁴, W.; Vinnaccia⁵, M; and Glavan⁶, J. C.

¹:yates@ucar.edu (NCAR); ²:Francisco.Flores@sei-us.org (SEI US); ³:Stephanie.Galaitsi@sei-us.org (SEI US); ⁴:billd@ccr-group.org (CCRG); ⁵:marco.vinnaccia@ead.ae (AGED I); ⁶:jglavan@ead.ae (AGED I)

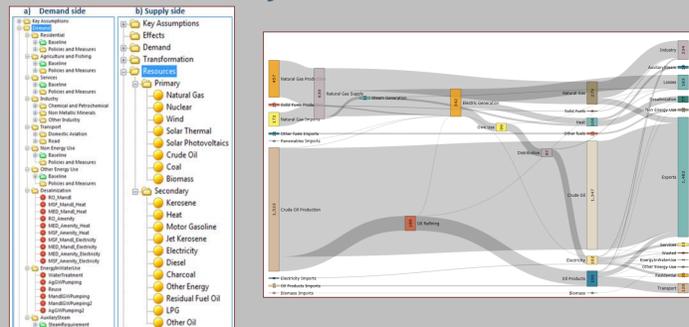
Steps Used to Analyze the National Water-Energy Nexus under Climate Change



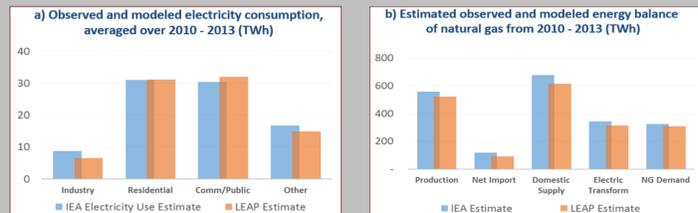
Schematic Representation of the UAE WEAP Model



Representation in LEAP of the UAE Energy System Model



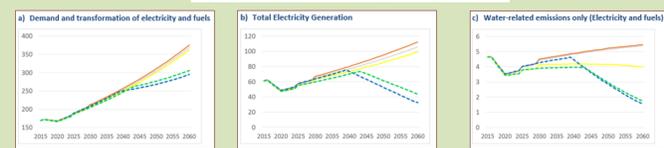
UAE LEAP Validation



Summary of Water Supply, Water Demand, Electricity Supply, and Energy Demand Across All Scenarios



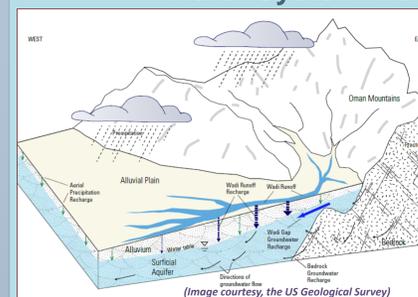
CO2e emissions across all sources (million metric tonnes)



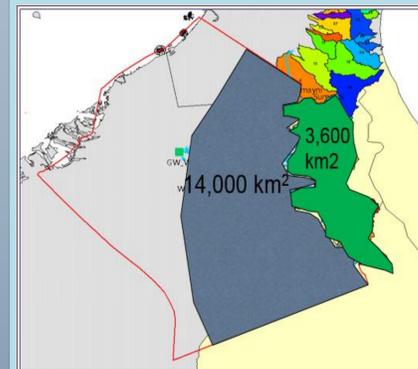
Summary of Costs and benefits associated with the implementation of the policy scenarios

Impact	Alternative Scenario	Starting Scenario	Water savings (BCM)	Fossil fuel savings (GWh)	CO2e reductions (million tonnes)	Total incremental cost (billion 2015\$)	Avoided CO2e emissions from policies (\$ per tonne)
From climate change, only	BAU-RCP8.5	BAU	-5	-470	-138	4	NA
From introduction of improved efficiency & conservation measures	High Efficiency & Conservation	BAU-RCP8.5	28	1600	283	-3	-\$10.2
From introduction of renewable energy and reductions in groundwater withdrawals	Natural Resource Protection	BAU-RCP8.5	0	4200	933	12	\$13.2
From introduction of all sustainable development measures	Integrated Policy	BAU-RCP8.5	28	4400	845	3	\$3.4

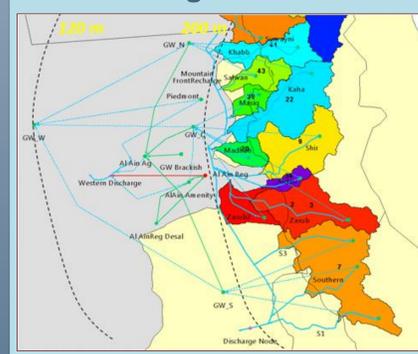
Modeled Components In the AI Ain Water System Model



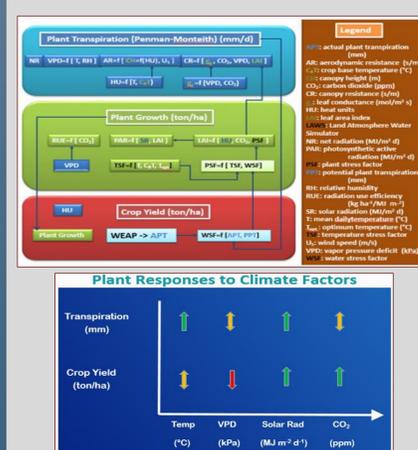
The AI Ain Water System Model Schematic



AI Ain Region in Abu Dhabi Emirate



WEAP's Plant Growth Model



Physically-based model of plant growth dynamics

Daily simulation of transpiration, evaporation, irrigation requirements and scheduling, growth season, biomass production and crop yield

Includes modules for estimating reference ET and soil water capacity

Uses the Penman-Monteith equation

Takes into consideration climate change and atmospheric CO₂ effects on plants' evapotranspiration, biomass production and agricultural yield

Water Demand and Supply Structure for the AI Ain Water Systems Model



Estimated Water Uses in the AI Ain Region

