

CASE STUDY

Co-optimization helps the Middle East confidently meet electricity and water demands in a rapidly changing economic environment.

Throughout the region, changing technologies and renewable targets are driving the need for simulation studies to ensure organizations meet current and future demands for power generation and water production. Immediately proving its value, PLEXOS delivered a 6% annual fuel saving when the optimized plan was implemented.

With over 400 different system elements, the project represented a new step in the fully co-optimized world of energy systems. However, the software's unique architecture and fully integrated modules ensured all requirements were included in the objective function.

PLEXOS simultaneously solved for electricity generation, heat production and water desalination production processes. Modeling for electricity encompassed the region's changing energy mix of coal, solar PV, CSP and pumped storage hydro power plants.

The Energy Exemplar team ran three-year backcasts to calibrate the system model database and found close dispatch results which confirmed that the optimization was performing the same as the live system.

With a calibrated database, the customer has a flexible model for performing a wide range of studies. Now secure in their analysis, the customer can run many scenarios to determine the reliability of their co-generation and desalination system.



Given the complex nature of the code constraints involved, the project started with WSP UK, consultants with an intimate understanding of the local intricacies. The team used PLEXOS to model the co-generation plants and then collaborated with Energy Exemplar to develop the PLEXOS code. Once tested, the customer appointed the Energy Exemplar to team for the implementation.