

In 2019, development efforts focused on releasing the initial model which couples natural gas and electric power systems into a single joint expansion planning formulation. There were three fundamental research directions that were pursued. First, we developed a novel global optimization method that will allow us to scale joint gas-grid expansion formulations to problems with  $> 1000$  nodes. Our initial results, which focus on the electric power system alone, demonstrate the promise of the approach. In this paper, we closed the optimality gaps beyond what was achievable by any prior method. Second, we extended the planning model to incorporate robustness to increased, but uncertain, demand. Here, we relied on recently development monotonicity arguments that allow us to focus attention on extreme points in the uncertainty set of the demand for gas. Finally, we in 2020 are developing models of extreme event induced contingencies and using them to generalize the set of events for which joint gas-grid networks are designed for resilience.