

The ARPA-E Power Grid Optimization project, which consisted of 3 Challenges, was funded from 9/1/2015 to 6/30/2024 with 15 extensions; the longest running project in ARPA-E history at the time. A total of \$9.24 million in prizes were awarded. The GO Competition would not have been possible without the exceptional support of ARPA-E (especially Tim Heidel, Kory Hedman, Ray Duthu, HyungSeon Oh, and Richard O'Neill) and the Competition predecessor GRID DATA participants who continued with the Competition, especially the many students and faculty now at UW-Madison (Chris DeMarco, Bernie Lesieutre, Scott Greene), TAMU (Thomas Overbye, Farnaz Safdarian, Adam Birch), Georgia Tech (Pascal Van Hentenryck, Wai Keung Terrence Mak), and NREL (Tarek Elgindy, Nongchao Guo, Elaine Hale, Bryan Palmintier). The LANL team, Carleton Coffrin, Robert Parker, and Manuel Garcia, were essential in providing the Benchmark solver that assessed the difficulty of the datasets. Hans Mittelmann, at Arizona State University, provided critical optimization expertise. Other critical members of the PNNL team included Stephen Elbert, Jesse Holzer, Arun Veeramany, Brent Eldridge, Feng Pan, Olga Kuchar, Shan Osborn, and Andy Piatt. The support of the PNNL Research Computing team, especially Tim Carlson, was invaluable. Finally, a sincere round of appreciation to the corporate sponsors that provided in-kind software that made the evaluations possible: AIMMS, AMPL, GAMS, Gurobi Optimization, IBM (CPLEX), Mosek, Panua Technologies, and Siemens.

Interest in the GO Competition was world-wide, but only American teams were eligible for prizes. The Competition has been cited over 500 times in the literature, including 12 dissertations (4 from foreign countries; Columbia (2), Germany, and Italy) and 3 from the DOE ExaScale project. Competition participants have published 34 journal articles, 115 technical papers, and one book chapter. Software developed by Pearl Street Technologies for Challenges 1 and 2 is now deployed by Southwest Power Pool (SPP) and Midcontinent Independent Service Operator (MISO). Other teams have received inquiries from venture capitalists. Google DeepMind has thanked the Competition for making the datasets developed for the Competition public. The larger datasets have billions of unknowns to be solved for, but only a small percent matter in the final solution. Knowing what unknowns are important can dramatically speedup the solution, something Machine Learning is expected to accomplish.