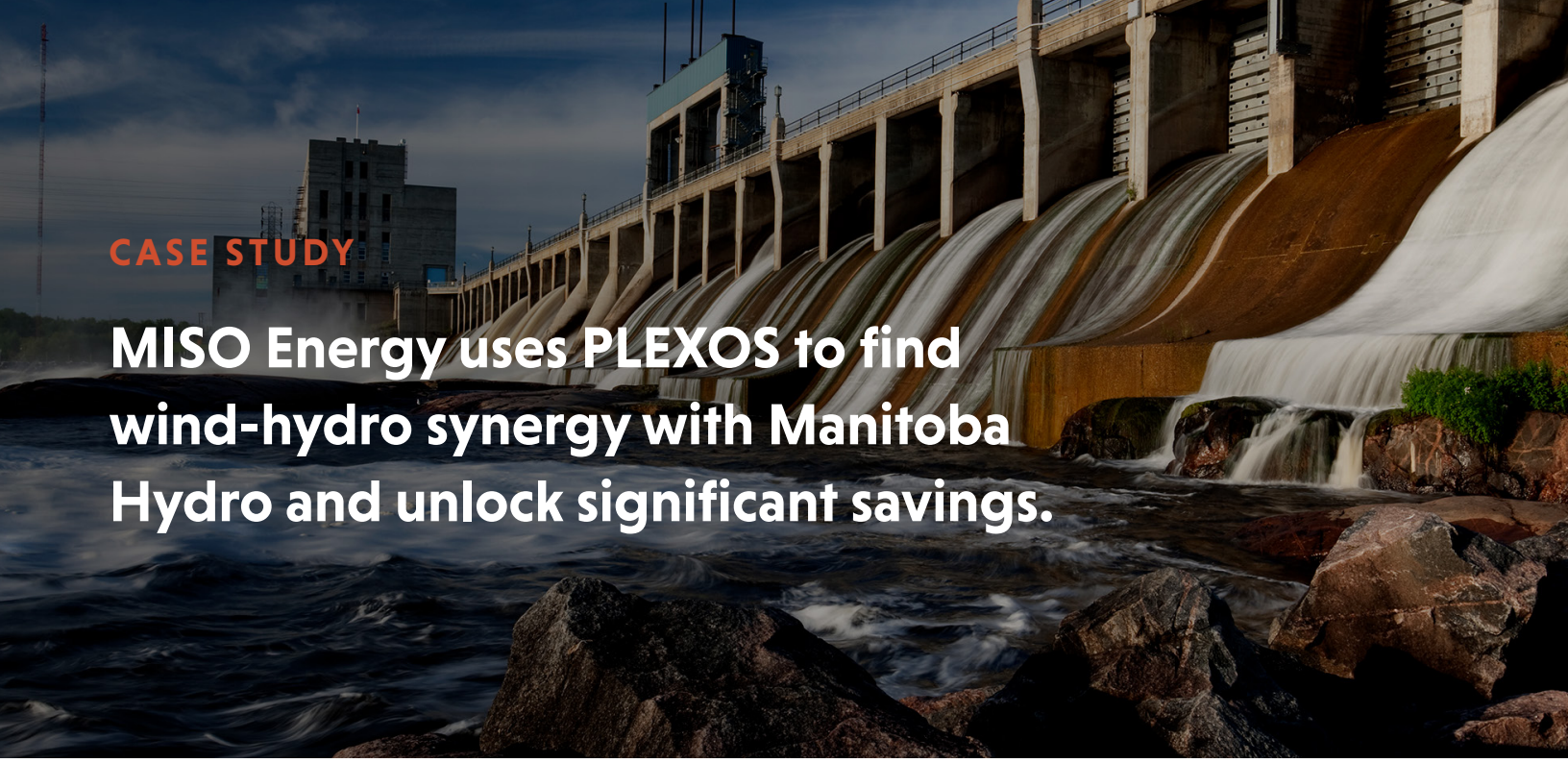

CASE STUDY

MISO Energy uses PLEXOS to find wind-hydro synergy with Manitoba Hydro and unlock significant savings.

MISO Energy's simulations found the cost of expanding the transmission capacity between Manitoba Hydro and MISO Energy would enable greater wind participation in the MISO Energy market. Both line connection options offered production, modified production, load and reserve cost savings and wind curtailment reduction.

Fueled by wind, gas, oil, coal and nuclear, MISO Energy provides electricity across 15 US states as well as Canada's Manitoba province. Manitoba Hydro has a similar reach, providing electricity and natural gas to more than 500,000 electric and 250,000 natural gas customers.

MISO Energy faced integration challenges due to the intermittent and non-peak nature of wind generation. It was thought these challenges could be mitigated by Manitoba Hydro's large and flexible system, which included 15 hydroelectric generating stations, as well as some thermal, diesel and wind capacity.

The simulations found that significant benefits could be realized from the addition of either an eastern 500 kV line between Dorsey, Manitoba and Duluth, Minnesota, or a western 500 kV line between Dorsey, Manitoba and Fargo, North Dakota/Moorhead, Minnesota.

The organizations chose PLEXOS as the simulation platform to evaluate the benefits and costs of expanding the interface between them.

They found PLEXOS met the needs for:

- Intricacies in modeling Manitoba Hydro's resources
- Efficiently responding to wind variability
- Modeling ancillary services
- Computing the complexity of the study
- Generating the required reports

MISO Energy operates one of the world's largest energy markets with more than $29 billion in annual gross market energy transactions.