Argonne
NATIONAL LABORATORY

LEVERAGING ARGONNE'S WATER POWER TECHNOLOGY TOOLS

Harnessing the Water Cycle for Renewable Energy

Argonne's Water Power Technologies scientists are teaming up with research and industry partners to study:

- New ways to optimize and increase the efficiency of water use.
- Next-generation conventional and pumped storage hydropower technologies.

THE CHALLENGE — OPTIMIZING OUR WATER RESOURCES

Research Need: Advanced modeling tools are needed to support decision-making for development of advanced hydropower facilities and water optimization projects.

Opportunity: Next-generation water power technologies offer new options for *Harnessing the Water Cycle*, such as:

- Developing advanced pumped storage hydropower projects to expand renewable power for flexible, reliable grids.
- Creating state-of-the-art analytical tools for hydropower owners and operators to evaluate power economics and environmental sustainability.

Solution: Argonne develops detailed models of hydropower and advanced pumped storage hydropower (PSH) technologies as well as new methods and/or tools for the optimization and valuation of hydropower resources.

ARGONNE DELIVERS MULTI-STAGE WATER POWER TECHNOLOGY EXPERTISE

> **Argonne's work spans the spectrum from developing advanced algorithms and models, to modeling applications and technology transfer.**

- **Using hydropower expertise to customize modeling tools** to simulate and optimize hydropower and PSH operations in traditional and restructured electricity markets.
- **Transferring Argonne-developed models** — GTMax, EMCAS, CHEERS — to users worldwide.
- **Adding infrastructure and power grid resiliency modeling expertise** to conduct water power impact analyses.
- **Providing access to world-class supercomputing** to expand modeling complexity and reduce processing times for faster results.

BENEFITS TO THE COMMUNITY

Argonne has partnered with hydropower operators for 35 years of hydropower analyses.

Argonne's GTMax and EMCAS models have been licensed to users in more than 40 countries around the world.

Major water power research areas of Argonne's Water Power Technologies scientists include:

- Environmental analysis and assessment;
- Systems and integration analysis;
- System, plant, and generating unit performance optimization;
- Modeling and simulation;
- Power market analysis; and
- Project valuation and investment decision-making.

CONTACT

Vladimir Koritarov
Manager, Water Power Program
Energy Systems Division
Argonne National Laboratory
Phone: 630-252-6711
Email: koritarov@anl.gov