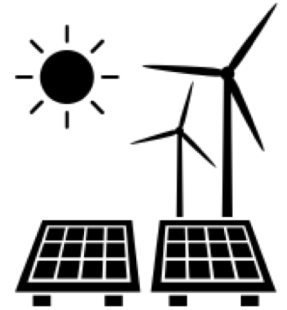


Renewable Energy Plant Optimization with Parallel Works

Bridging the gap between complex optimization and actionable insights for developers

Increase the safety, reliability and efficiency of renewable energy systems.

Parallel Works is a high performance computing platform that enables engineers and analysts to **build, deploy and run** large-scale workflows that support critical decisions across the energy plant design and optimization process. It supports more accurate **prediction and optimization of a plant's IRR, system capacity, yield**, or any other desired objective function. It allows for users to seamlessly share these tools across teams to accelerate the engineering process. Conducting design studies at scale supports the knowledge to make renewable solutions safer, more reliable and efficient.



What Parallel Works delivers for renewable energy engineers.

Model development & testing at massive scale



Quickly shape, measure, tune, and iterate on plant design and operations workflows ranging from simple optimization of contained PV systems to complex technical performance and efficiency analyses on utility-scale systems.

Simple, intuitive workflow deployment



Package and deploy your workflows with a simple UI in the cloud. Automatically scale based on the needs of your study to get results fast. Then share workflows across teams to standardize processes and make engineering operations more efficient.

Immediate impact, lasting benefits across the enterprise.



Rapid Insights. Accelerate time to insight with Parallel Works rapid workflow execution. For complex plant optimization models that are running slowly on a desktop or not scaling effectively, Parallel Works provides a highly scalable, robust, and low-latency workflow model that reduces computing bottlenecks and delivers insights fast.



Increased Productivity. Easily tune and test new models quickly using the Parallel Works Workflow Development lab for engineers to collaborate on models and frameworks. Quickly push your entire environment to the cloud for deployment at scale with the Parallel Works workflow engine.



Optimized Compute Spend. For short that need to run at mega-scale, the Parallel Works workflow system delivers rapid speed and low latency, making optimal use of the computing resources and delivering the highest return on cloud compute investment. It is robust and fault-tolerant, reducing the risk of frustrating debugging and workload failures.

Why Parallel Works?

It's fast.

Latest benchmark clocked at 1.5 billion tasks / sec using 100 microsecond tasks on 500,000 cores

It's flexible.

Jobs can be run using any software applications or languages through embedded interpreters and run on any compute infrastructure

It's open.

Based on an open source technology from Argonne National Labs developed with support from the DOE and NSF



Parallel Works

Learn more about how Parallel Works can enhance your solar energy design practice

Matthew Shaxted

Founder & President

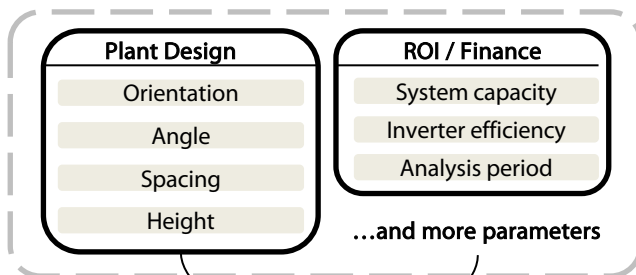
shaxted@parallelworks.com

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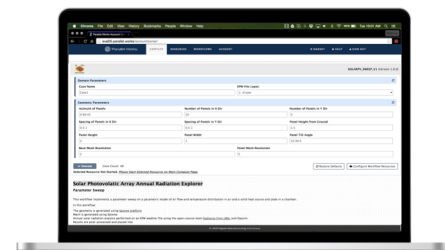
Example workflow overview

See how Parallel Works can empower engineers to develop and deploy advanced workflows that streamline engineering efforts, drive key insights, and support critical plant design and operations decisions. Once built, these workflows can be shared across the organization to accelerate engineering processes.

Plant Inputs and Parameters



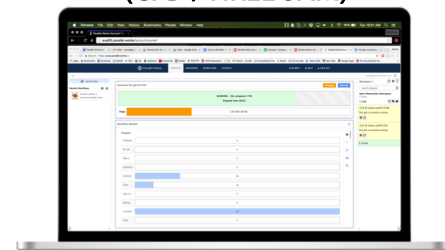
Web-Based Input



Specify inputs, parameters and variables



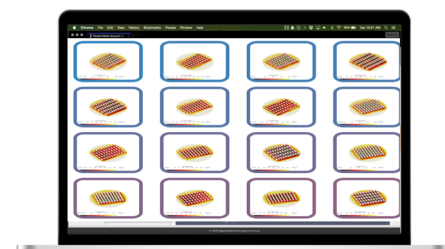
Simulation Engines (CFD / NREL SAM)



Track workflow progress and view intermediate results



Easy-to-Analyze Results

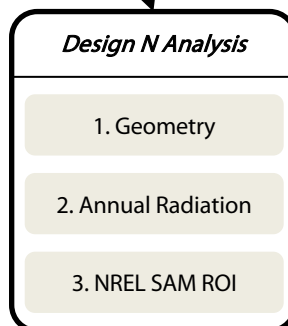
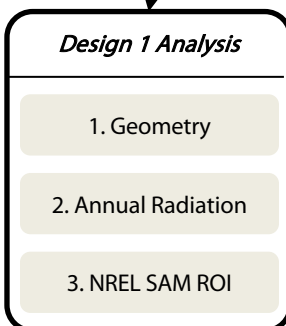


Rapidly analyze and visualize 1000x simulation results

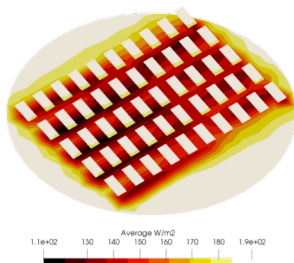
Swift Parallel Script Wrapper

swift Argonne NATIONAL LABORATORY
<http://swift-lang.org>

Execution on Diverse Computing Resources

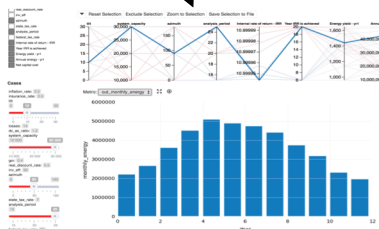


Web-Based Result Visualization



Radiance

Weather-Dependent Annual Solar Radiation or Wind Profile



NREL NATIONAL RENEWABLE ENERGY LABORATORY

Optimized ROI, NPV, payback period, etc.