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**Req  
Number**  
R4266

**Title and Link**

[Researcher - Electricity  
Market Design & Modeling](#)

**Job Description**

NREL uses a variety of power systems planning and operations tools to understand the evolution of domestic and international power systems. This position will work with senior researchers to conduct international and domestic energy research and power system analyses, including production cost modeling, wholesale market design, and renewable integration. The ideal candidate must have previous experience modeling power systems, with exceptional mathematics (including statistics and/or economics), programming, and analysis skills. Demonstrated strengths in wholesale market design, transmission planning, price formation, and NERC reliability standards are preferred.

The successful candidate will  
Conduct research in the areas of wholesale electricity market design, revenue sufficiency of electric resources, electric customer (ratepayer) impacts, and other related topics.  
Develop and execute models, conduct rigorous analysis, and publish results in written reports and spoken presentations.  
Communicate with a range of stakeholders, e.g., DOE, energy ministries, utilities, regulators, and private firms.

- R4390 [Postdoctoral Researcher: Applied Mathematics for Uncertainty Quantification and Stochastic Programming](#) The Complex Systems Simulation and Optimization Group in the NREL Computational Science Center has an opening for a full-time Postdoctoral Researcher in applied mathematics specializing in uncertainty quantification and stochastic programming. Emphasis is placed on the construction and solution of stochastic systems, optimization problems, and uncertainty quantification for energy systems research. We are looking for a dynamic, motivated researcher with a strong technical background and an interest in the mission of NREL.
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- The successful candidate will collaborate with NREL staff and researchers, other national labs, and universities on efforts to develop optimization problem formulations for energy systems research, and the numerical methods and efficient parallel algorithms to solve such problems using high-performance computing (HPC) systems located both at NREL and other national laboratories. Enabling NREL and its collaborators to fully utilize NREL's HPC systems, Peregrine and Eagle, for research and development activities is paramount to addressing national goals for utilization of renewable energy and energy efficiency technologies.
- Responsibilities include:  
Collaborate with NREL and research partners to design, implement, and carry out numerical and computational experiments that are dependent on the construction and solution of linear and non-linear complex, coupled, and stochastic systems including the implementation and execution of workflows on HPC systems.
- Conduct independent and collaborative research in developing and using advanced applied mathematics, modeling, and simulation for energy systems research.
- R4615 [Engineer II - Distributed Generation Data Scientist](#) Distributed technologies like solar photovoltaics, storage, and wind are changing the energy landscape. This position will join our distributed generation (dGen) modeling team as we strive to understand what drives consumers to place solar panels on their roof and batteries in their basements. We are looking for quantitative social scientists with interest researching distributed energy resources issues. NREL's dGen model modeling tool is an agent-based model that relies on rich socio-economic and geospatial data to forecast the adoption and deployment of distributed technologies like solar PV. The dGen team is looking for a research analyst with a passion for big data, economics, consumer behavior, and rate design to join their growing team. Because this is an emerging research area, we are interested in applicants from a broad background. This position will require the successful candidate to participate in the development and execution of models, analysis of results, and publication of results in written reports and spoken presentations.

R4707 [Graduate Intern \(Summer or 9 months\) Solar Data Analysis and Visualization](#) The National Renewable Energy Laboratory (NREL), located at the foothills of the Rocky Mountains in Golden, Colorado, is the nation's primary laboratory for research, development and deployment of renewable energy and energy efficiency technologies. NREL's Strategic Energy Analysis Center has an opening for an undergraduate or graduate level student internship during Summer 2019, focusing on producing analysis and visualization of adoption of rooftop solar by low and moderate-income households in the United States.

Responsibilities include:

Literature review and data collection.

Analyzing datasets on solar technical potential for low and moderate income (LMI) households.

Developing visualizations of LMI solar potential.

Collaborating with senior staff to evaluate results and publish visualizations.

R4741 [Postdoctoral Researcher: Artificial Intelligence and Stochastic Optimization for Energy Systems](#) The Complex Systems Simulation and Optimization Group in the NREL Computational Science Center has an opening for a full-time postdoctoral researcher in artificial intelligence (AI) and stochastic optimization for energy systems, with special emphasis on deep reinforcement learning (RL) for AI control. We believe that AI-powered systems have the potential to transform our renewable energy future through advanced automation and control, and are looking for a dynamic researcher with a strong technical background to help pursue this goal.

Stochastic optimization and sequential decision problems arise in a variety of areas of renewable energy research including power system planning and management, wind farm optimization, battery management, building energy management, and transportation. At the same time, recent advances in AI (and deep RL in particular) suggest that complex decision making can be optimized via a combination of machine learning, modeling and simulation, often with clear advantages over traditional optimization-based methods. However, these ideas are only just starting to be applied to renewable energy systems and thus constitute a promising set of research directions.

The successful candidate will collaborate to develop, adapt, improve, and scale cutting edge AI methods to real-world projects in support of NREL and EERE mission and goals. In addition, the candidate will collaborate with NREL staff and researchers, other national labs, and universities on efforts to develop and apply AI at scale to real-world problems in renewable energy research, with specific emphasis on modernization of the nation's grid, building, and transportation infrastructure and operation to support the 100% renewable energy scenario. In particular, the candidate will participate in a large interdisciplinary effort to establish the foundations of so-called "autonomous energy

R4779

[Distributed Electrical Systems  
Researcher](#)

The Strategic Energy Analysis Center at NREL is seeking a technically-focused and experienced research analyst passionate to work on research questions related to the electric distribution grid. As the number of complex clean energy technologies continues to grow on the electric distribution grid, the research questions are exploding. The position will involve work the combination of transferring power system modeling outputs in combination with costs, markets and other factors to answer these cutting-edge research questions. The successful candidate will demonstrate the ability to combine scientific, engineering, and economics perspectives with excellent work habits, communication skills, and quantitative analysis capabilities. This position can be located at NREL's Golden, CO office.

More specifically, this position will provide expertise and support in the following ways:

Strong analytical and critical thinking skills, experience with data collection, and ability to work on a diversity of topics is essential. Ability and interest in interacting regularly data partners and collaborators in industry (including C-level folks at utilities, solar companies, and technology vendors) required.

Strong communications and presentation skills required, including ability and interest to first-author reports and publications.

Background in electrical engineering or power systems preferred.

Work will require reviewing, analyzing, and incorporating results from power flow modeling into techno-economic analysis. Some familiarity with power systems required, experience in energy or power system analysis preferred.

Experience with financial modeling and knowledge of DER integration and policy strongly preferred.

Familiarity with solar and storage technology and economics strongly preferred. Experience using NREL's SAM model is a plus. Experience analyzing and manipulating geospatial datasets also a plus.

- R4781 [Energy and Manufacturing Techno-Economic Researcher](#) The Strategic Energy Analysis Center at NREL is seeking a technically-focused and experienced research analyst in energy systems cost modeling and manufacturing analysis. The position will involve work in three inter-related areas: (1) developing technical cost models to analyze the costs of energy systems, (2) working with internal and external partners to collect primary data to populate the models, and (3) utilizing the models to support the evaluation of targeted R&D opportunities, technology advancements, and manufacturing developments as they relate to a range of market and policy issues. The successful candidate will demonstrate the ability to combine scientific, engineering, and economics perspectives with excellent work habits, communication skills, and quantitative analysis capabilities. This position can be located at NREL's Golden, CO office. More specifically, this position will provide expertise and support in the following ways:
- Perform analysis to:
    - Collect data and information on technology manufacturing and installation processes and costs.
    - Evaluate trade and manufacturing issues related to efficiency and renewable energy technologies.
    - Identify opportunities for component-, system-, and operations-level cost reductions.
    - Interpret model results for policy, market, economic and/or technology analysis.
  - Utilize models in support of both internal and external R&D planning and evaluation through collaboration with other national labs, universities, and industrial partners.
  - Publish results in technical reports, conference proceedings, and journals.
  - Present work at conferences, symposia, and review meetings.
- R4881 [Postdoctoral Researcher - Scientific Visualization](#) The Data, Analysis and Visualization group in NREL's Computational Science Center has an immediate opening for a Postdoctoral Computational Scientist to pursue a cross-disciplinary research project in scientific visualization with an emphasis in visual analytics and knowledge discovery in large-scale computational data.
- The successful candidate will help to develop visualization-based software to model and analyze complex integrated energy systems.
- The candidate will integrate these software tools with scientific and engineering workflows for decision support and data analysis. These workflows will include the use of state-of-the-art high-performance parallel computing (HPC) and visualization facilities. The candidate will evaluate and communicate results through written research reports for publication and presentation at seminars, will participate in group meetings and seminars, and will assist in developing grant proposals for new research directions.

R5016

[Cloud Computing Support Engineer](#)

The High Performance Computing Systems and Operations Group in the Computational Science Center is in need of a talented individual with systems administration skills and a familiarity with cloud configuration and system reliability. This candidate must have an interest in making a difference in the world by helping to maintain, monitor and troubleshoot cloud hosted systems that support a variety of web applications and data-sharing platforms related to sustainable energy technologies and markets. This position will predominantly involve systems monitoring, client support and cloud service administration. This candidate will work directly on existing projects by supporting cloud-based solutions for external and internal applications and analysis. The ideal candidate must be able to work across organizations and have strong communications skills in order to work with project clients as well as internal sysadmins in the Information Technology Services (ITS) Group. Being able to think creatively and strategically is a plus and being comfortable writing appropriate systems documentation is also required.

We have a team of application developers and data scientists who are creating leading-edge web applications and data-driven web platforms to advance sustainable energy research and deployment. Working with them, you will:

Be a key systems administrator and engineer for NREL's cloud platform.

Provide support to, and work closely with, project owners and developers to maintain cloud servers and services.

Identify evolving needs by monitoring system performance.

Respond in a timely manner to ticketing system and document support as appropriate.

Maintain production, staging, testing, and continuous integration environments.

Support our database administrators to ensure data systems are

R5017

[Cloud Computing  
Infrastructure Engineer](#)

The High Performance Computing Systems and Operations Group in the Computational Science Center is in need of a talented individual with strong systems administration skills and experience using cloud computing services. This candidate must have an interest in making a difference in the world by helping to design, build, automate and enhance cloud hosted systems that support a variety of web applications and data-sharing platforms related to sustainable energy technologies and markets. This position will predominantly involve systems architecture and service provisioning, with a strong focus on security, reliability and performance. This candidate will work directly with project leaders to help design, implement and enhance cloud-based solutions for external and internal applications and analysis. Some systems architecture work may also be required to interface with systems on the internal NREL campus network. The ideal candidate must be able to work across organizations and have strong communications skills in order to work with project clients as well as internal Systems Administrators in the Information Technology Services (ITS) Group. This position involves learning and working with a wide array of technologies at all tiers of a software and infrastructure stack. This position involves multitasking and prioritization across many teams and projects. This position requires independent thought, initiative and also guidance/direction for stakeholders to meet the needs of their projects, and also requires communication, adherence to internal processes and documentation to properly keep the cloud team and others involved up to date. Being able to think creatively and strategically and being comfortable writing appropriate systems documentation is also required.

We have a team of application developers and data scientists who are creating leading-edge web applications and data-driven web platforms to advance sustainable energy research and

R5078

[Postdoctoral Researcher:  
Reinforcement Learning in  
Model Renewable Energy  
Applications](#)

The Complex Systems Simulation and Optimization Group in the NREL Computational Science Center has an opening for a full-time postdoctoral researcher in reinforcement learning (RL) applied to model renewable energy problems. We believe that RL-powered systems have the potential to transform our energy future through advanced automation, control, and planning and are looking for a dynamic researcher with a strong technical background to help pursue this goal. This position represents a unique opportunity to apply RL to complex real-world problems, to explore and understand its performance in the broader context of optimal planning and control, and to advance the state of the art in the field of renewable energy research.

The modern power grid is rapidly becoming too complex to rely entirely on traditional optimization models for control and planning. Reasons for this include: (a) feedback-based control models are often unavailable or intractable, (b) system size renders centralized control infeasible and (c) system dynamics are constantly evolving at multiple scales. Recent advances suggest that RL has the potential to overcome these challenges either as a stand-alone approach or in conjunction with traditional methods. However, these ideas are only just starting to be applied in renewable energy systems and thus constitute a promising and exciting set of research directions.

The successful candidate will collaborate to develop, adapt, improve, and scale cutting edge RL methods to real-world projects in support of NREL and EERE mission and goals. In addition, the candidate will collaborate with NREL staff and researchers, other national labs, and universities on efforts to develop and apply RL at scale to real-world problems in renewable energy research, with specific emphasis on modernization of the nation's grid, buildings, and transportation

R5079

[Postdoctoral Researcher:  
Quantum Computing for  
Clean Energy Systems](#)

The Complex Systems Simulation and Optimization Group in the NREL Computational Science Center has an opening for a full-time postdoctoral researcher in quantum computing for energy systems, with special emphasis on formulations and implementations targeting near-term quantum computing hardware. We believe that quantum computing has the potential to enable algorithms with fundamentally different scaling properties that break the curse of dimensionality, ushering in a new era of energy- and time- efficient computing that enables optimization and control of energy systems at an unprecedented scale. We are looking for a dynamic researcher with a strong technical background to help pursue this goal.

Combinatorial optimization problems arise in a variety of ways in renewable energy research, including power systems design and operation, materials discovery and modelling, chemistry, artificial intelligence (AI) control, etc. Quantum computing, due to the unique scaling properties resulting from entanglement and superposition, is a leading candidate for solving classically-intractable, combinatorially complicated problems. Noisy intermediate scale quantum (NISQ) computers, currently being brought online, represent the vanguard of machines that will usher in this new paradigm of quantum-enhanced optimization. The prospects for how and when NISQ machines will concretely affect the tenor and pace of renewable energy research, however, remain largely unexplored.

The successful candidate will collaborate to develop, adapt, improve, and scale cutting edge quantum computing methods to real-world projects in support of the NREL and EERE clean energy mission. In addition, the candidate will collaborate with NREL staff and researchers, other national labs, and universities on efforts to develop and apply quantum computing to real-world

R5080

[Postdoctoral Researcher:  
Uncertainty Quantification for  
Clean Energy Systems](#)

NREL's Computational Science Center has an opening for a postdoctoral researcher in uncertainty quantification (UQ) for clean energy systems, with a particular emphasis on applications in power systems and wind energy. The researcher will be involved in a variety of activities including forward and inverse UQ, optimization under uncertainty, sensitivity analysis, dimension reduction, and verification/validation studies. We are looking for a candidate with experience in one of the following domains: electrical power systems, computational fluid dynamics, or renewable energy, and familiarity with multi-level/multi-fidelity techniques, the development of surrogate models, and uncertainty quantification, propagation, and visualization.

The ideal candidate will be a dynamic and motivated researcher with a strong technical background and an interest in the mission of NREL. The successful candidate will collaborate with NREL staff on efforts to develop and apply uncertainty quantification and surrogate modeling methods to real-world problems in renewable energy research, with specific emphasis on modernization of the nation's electrical infrastructure and operation to support the large amounts of renewable energy generation.

Responsibilities include:

Collaborate with NREL researchers to design, implement, and visualize a range of UQ techniques to improve the planning, operation, and generation of electricity from conventional and renewable energy sources.

Implement dimension reduction and surrogate modeling techniques for energy systems.

Develop new UQ methods for clean energy applications.

Author, present and assist in the preparation of journal papers, technical reports and conference proceedings on topics related to uncertainty quantification and surrogate modeling and their

R5100

[Postdoctoral Researcher –  
Computational Modeling of  
Multiphase Reacting Flows](#)

The National Renewable Energy Laboratory (NREL) is a leader in the U.S. Department of Energy's effort to secure an energy future that is both environmentally and economically sustainable. With locations in Golden, Boulder and Washington D.C., NREL is the primary laboratory for research, development and deployment of renewable energy technologies in the United States. The NREL mission is to develop renewable energy and energy efficient technologies and practices, advance related science and engineering, and transfer knowledge and innovation to address the nation's energy and environmental goals.

The High-Performance Algorithms and Complex Fluids (HPACF) group in the Computational Science Center at NREL has an opening for a full-time postdoctoral researcher to support multiphase modeling projects pertaining to bioenergy conversion processes. The researcher will develop and apply state-of-the-art two-fluid/mixture computational fluid dynamics (CFD) models to simulate reacting multiphase flows in aerated bioreactors and enzymatic hydrolysis reactors. She/he will also develop system level tools for optimization and infrastructure to connect multiple simulation tools. This computational modeling work will also focus on extending algorithmic capabilities within existing software packages such as OpenFOAM and to provide actionable guidance to experimental/industry partners on reactor operation and optimization.

Primary Duties Include:

Configuring and executing simulations, specifically of aerobic fermentation and/or enzymatic hydrolysis reactors.

Work with collaborators at NREL and other potential partners (national laboratories, universities and industry) to identify appropriate computational models and simulations to efficiently address client needs.

R5101 [Computational Scientist – Physics based identification of anomalous sensor data through machine learning and edge computing](#)

The National Renewable Energy Laboratory (NREL), located in the foothills of the Rocky Mountains in Golden and Boulder, Colorado, is the nation's primary laboratory for research and development of renewable energy and energy efficiency technologies. NREL's Computational Science Center has an immediate opening for a scientist to develop and deploy edge computing algorithms.

This position will involve developing and implementing algorithms formulated to combine computational fluid dynamics (CFD) simulations with real time data streams to detect anomalous behavior on simulated and actual edge computing hardware. The envisioned system will combine various sensor inputs (e.g., turbine performance metrics, wind inflow conditions including turbulence and stability, and other available operational data usually logged via SCADA streams) to identify malfunctioning sensors or underperforming turbines. Potential applications include detecting faulty anemometers, pitch and/or yaw misalignment, and incorrect control settings. Additionally, the candidate will explore the use of machine learning techniques in the field to reduce the volume of data that needs to be logged by wind plant operators without sacrificing the fidelity of the data sets for future analysis and inspection.

R5102 [Computational Scientist – CFD on Next-Generation Platforms](#)

The National Renewable Energy Laboratory (NREL), located in the foothills of the Rocky Mountains in Golden and Boulder, Colorado, is the nation's primary laboratory for research and development of renewable energy and energy efficiency technologies. NREL's Computational Science Center has an immediate opening for a scientist to develop scientific software, primarily computational fluid dynamics (CFD) applications, to run on petascale and next-generation exascale computational hardware.

NREL is continuing an active research and development program for high performance computing of wind turbine and wind farm dynamics as a joint effort between the National Wind Technology Center (NWTC) and the Computational Science Center (CSC). The effort will enable advances in our fundamental understanding of the flow physics governing whole wind plant performance including wake formation, complex terrain impacts, and turbine-turbine-interaction effects. This position will initially be part of a large multi-lab team working to realize the goals of this specific effort, but it is expected that the successful candidate will expand into additional areas aligned with the NREL mission. The successful applicant will develop prototypes, characterize performance on cutting-edge hardware, provide the data to support design decisions as the broader project proceeds and tune implementations for world leading computational performance.

R5110

[Energy Economist & Modeler](#)

NREL conducts world-class research in energy efficiency, sustainable transportation, renewable energy technologies, and energy systems integration and optimization. Nestled in the foothills of Golden, Colorado, surrounded by grassland, and convenient to Denver, Boulder, and several suburbs, the NREL campus is a living experiment filled with curious researchers and advanced energy technologies (e.g., best-in-class energy efficiency, daylighting, MW-scale solar photovoltaics, buildings heated by computers, optimized electric vehicle charging, hydrogen fueling station).

The successful candidate will work in Golden with an interdisciplinary team of experienced NREL researchers to develop a computational agent-based model to study stakeholder outcomes under a variety of economic and regulatory structures (e.g., wholesale markets, retail rates, vertically integrated utilities, incented adoption programs) operating in different technological futures and subject to realistic human behavior. The team will formulate and study two distinct use cases: one focused on the roles of distributed energy resources (DERs), and the other examining the impacts of large corporations or small cities meeting their own renewable energy goals through power purchase agreements (PPAs). Expected outcomes include the development and documentation of a new capability, an analysis of stakeholder outcome sensitivity to economic structures, and the demonstration of an ability to optimize economic structures subject to societal and stakeholder perspectives.

To these ends, we seek an exceptionally curious numerical modeler with significant object-oriented programming experience, conversant with a variety of optimization techniques, and interested in connecting data and models across siloed disciplinary boundaries. An economic modeler with experience

R5113

[Postdoctoral Researcher:  
Scalable, Parallel,  
Accelerated Exascale  
Computing Algorithms and  
Software for Clean Energy  
Systems](#)

The Complex Systems Simulation and Optimization Group in the NREL Computational Science Center has an opening for a full-time Postdoctoral Researcher in scalable, parallel, accelerator-based high-performance (HPC), and Exascale computing algorithms and software applied to clean energy systems research funded by the DOE Advanced Scientific Computing Research (ASCR) office as part for the Exascale Computing Project (ECP), Office of Electricity (OE), and the Office of Energy Efficiency and Renewable Energy (EERE). Emphasis is placed on the construction, implementation, solution and analysis of complex systems, stochastic systems, optimization problems, uncertainty quantification, and linear/nonlinear systems including underlying linear algebra to effectively utilize HPC systems.

We believe that simulation and machine learning leveraging the power and scalability of HPC has the potential to transform our energy future and advance the state of the art in the field of renewable energy research and deployment. We are looking for a dynamic, motivated researcher with a strong technical background and an interest in the mission of NREL, EERE and the DOE in general. Enabling NREL and its collaborators to fully utilize DOE Exascale computing systems and NREL's HPC systems for modeling large power grids, transportation systems, and other energy systems is paramount to addressing national goals for renewable energy and efficient, resilient energy systems.

The successful candidate will collaborate with researchers across multiple national laboratories to develop breakthrough scalable, accelerated, simulation capabilities for the power grid and transportation expansion, planning, operations and analysis on the fastest supercomputers in the world. Your efforts will also contribute to the successful use of the first Exascale HPC systems in the United States. Our studies incorporate high-

R5119 [Postdoctoral Researcher --  
Economic Modeling](#)

The Economics and Forecasting Group at the National Renewable Energy Laboratory (NREL) is seeking a Postdoctoral candidate with experience in economic and optimization modeling to join a team of expert analysts and modelers to develop a state-of-the-art model of the US and global economies. This is an exciting opportunity for a motivated individual to take part in new areas of research and modeling at NREL, the nation's primary laboratory for research, development, and analysis of renewable energy and energy efficiency technologies.

The successful candidate would work with senior researchers to develop a computable general equilibrium (CGE) model in the Julia programming language to be linked with models of the transportation and electricity sectors either through co-optimization or iteration. Following model development, the successful candidate would also help to conduct analyses on the interactions of energy systems and the economy.

Previous experience with economic equilibrium modeling is required. Experience with equilibrium-based modeling approaches, such as Mixed Complementary Problems (MCPs), is strongly preferred. The successful candidate should also have knowledge of the energy sectors, specifically electricity generation and transportation, as well as general knowledge of optimization modeling.

Specific job duties may include:

Data manipulation and model development,  
Scaling, testing, and validating the resulting model structure using high performance computing resources and advanced solving techniques,  
Presenting analyses at meetings, conferences, and workshops,  
Writing and publishing results of methods in peer-reviewed

R5130

[Geospatial Data Science  
Researcher](#)

The Geospatial Data Science (GDS) team in NREL's Strategic Energy Analysis Center has an immediate opening for a scientist to pursue several research projects targeting real-world energy system design problems. This position will support the growing research portfolio of the GDS team, creating new capabilities to analyze scenarios and design solutions for complex challenges in sustainable energy development for a variety of clients both within NREL and external to the laboratory. The successful candidate will develop novel analysis solutions to address research questions that are inherently spatiotemporal and include renewable energy resource characterization (e.g. solar or wind), technoeconomic modeling of energy production including assessment of social, physical and other factors, system performance modeling, scenario and uncertainty assessment, and imagery analysis. Duties will include:

Developing innovative spatiotemporal methods in machine learning, information extraction and predictive modeling to help researchers, clients, and stakeholders analyze and evaluate design strategies to uncover insights and implement sustainable energy solutions at various geographic and temporal scales; Integrating multiple data sources, models, and software tools with scientific and engineering workflows for decision support and data analysis. These workflows will include the use of distributed computing and utilization of both cloud and high-performance parallel computing (HPC) resources;

Evaluating and communicating results through written research reports for publication in journals and presentation at seminars, participating in group meetings and seminars, and assisting in developing proposals for new research directions.

R5133

[Postdoctoral Researcher – Scalable, Parallel, HPC Computing, Simulation and Optimization for Transportation](#)

The Complex Systems Simulation and Optimization Group in the NREL Computational Science Center has an opening for a full-time postdoctoral researcher in scalable, parallel computing and simulation for transportation via multi-mobility transportation demand, routing, traffic simulation, simulation calibration, optimization, and infrastructure planning. We are developing multi-mobility, high-fidelity and scalable demand, routing and traffic simulation and optimization methods to investigate the use of new mobility technologies, such electric vehicles, autonomous vehicles and ride-hailing services, to maximize transportation energy efficiency, productivity, and electric grid harmonization.

We are looking for a dynamic, motivated researcher with a strong technical background and an interest in the mission of NREL and the department of energy office of energy efficiency and renewable energy. Emphasis is placed on collaborating with a small team to develop multi-mobility parallel demand models, traffic simulation and optimization methods that scale on high performance computing (HPC) systems. The successful candidate will work with NREL staff and researchers, and other national labs to develop, adapt, improve and scale cutting edge transportation simulation models and solution algorithms to address large-scale transportation problems.

Responsibilities include:

Collaborate with NREL researchers to develop large-scale parallel transportation simulations on HPC systems and calibrate them to accurately represent multi-mobility demand, traffic flow, congestion and interactions with the electric grid.

Develop scalable traffic control optimization methods for urban-scale traffic operation and real-time traffic management.

Contribute to the design and development of parallel software frameworks for the integrated planning of transportation systems

R5174 [Year-Round Intern - System Advisor Model](#)

The National Renewable Energy Laboratory (NREL), located at the foothills of the Rocky Mountains in Golden, Colorado, is the nation's primary laboratory for research, development and deployment of renewable energy and energy efficiency technologies. NREL's Strategic Energy Analysis Center has an opening for a student internship in renewable energy system model development, validation, and case study analysis for the System Advisor Model (SAM) tool.

Position will support the continued development of the models in System Advisor Model (SAM). More information about SAM can be found (and it can be downloaded) at <https://sam.nrel.gov>. Duties may include assisting with literature reviews, validation and testing of new beta features in the model, development and programming of new capabilities as needed, and setting up case studies in the model of specific systems and verifying outputs. Additional tasks may be apportioned commensurate with the specific skills and capabilities of the intern.

This position is anticipated to be part-time during the 2019/2020 school year, if currently attending school. Additional hours during breaks and next summer are possible, as well. Minimum number of typical hours/week would be 8 and flexibility is possible during exams, etc.

As part of the Data Analytics, Tools, and Applications team, you will be driving positive change by building, maintaining, and enhancing data-sharing platforms for the world to utilize. You will become a valuable member of the team, working on full-stack development including effective UI and UX design, performance, and security. You will join developers that use a variety of technologies across many applications and platforms, with ample opportunity to learn and teach with your peers.

#### Our Team

You will join a team where everyone – including you – is striving to improve their knowledge of web technologies, best practices and cares about the best possible user experience. Our team creates secure, reusable, and efficient code. Accessibility and inclusivity are important to us, and we therefore strive to meet 508 compliance with all of our applications. You will become a champion for these principles through coding practices and interface design.

We have strong relationships with our many clients and listen closely to their needs on a regular basis. This requires we be well organized and manage our time efficiently. Requests from clients vary in size and scope. We trust each other to ask for help when it is required but are not afraid to dig into problems ourselves.

#### Our Tech

The Data Analytics, Tools, and Applications team builds many of our applications in AWS environments using PHP, Python, Mongo, MySQL and ElasticSearch. We make extensive use of JavaScript, jQuery, CSS3, HTML5, version control systems such as Git and SVN, and a variety of web services and APIs. Our applications are custom-built to meet the specific requirements of our clients and we build them in the technologies best suited to

R5184 [Life Cycle Assessment Analyst \(Researcher II\)](#)

The Researcher II (engineer/analyst/scientist) will join a team of researchers in NREL's Strategic Energy Analysis Center (SEAC; [www.nrel.gov/analysis](http://www.nrel.gov/analysis)) who perform environmental sustainability assessments of energy technologies. With objective, technology-neutral analysis, SEAC aims to increase understanding of energy policies, markets, resources, technologies, and infrastructure to address U.S. economic, security, and environmental priorities.

Job Duties include:

Conduct and support environmental life cycle assessment studies of building materials and technologies, manufacturing processes, and renewable energy technologies through data collection, literature reviews, energy and GHG impact modeling, scenario and sensitivity analysis, and data charting and reporting.

Support research projects and conceive/implement novel modeling and analysis methods to assess the sustainability implications of technology development

Analyze potentially transformative changes such as the novel manufacturing and buildings materials, designs and processes

Translate analysis results into effective and influential communication products and tools tailored to client requests and audience requirements, including high-quality journal publications, reports and conference presentations

Contribute to the preparation of research proposals.

R5223 [Energy Intensity Indicators Analysis Internship](#)

An advanced undergraduate/graduate student internship position is available within the National Renewable Energy Laboratory's (NREL) Strategic Energy Analysis Center in our Washington, DC office. NREL is the nation's primary laboratory for research, development and deployment of renewable energy and energy efficiency technologies. The opening is part-time (20 hours per week) during the fall and winter/spring semesters (September through April), with an option for full-time during the summer (May through August). The successful candidate will work collaboratively with senior analysts to develop analysis of energy intensity trends in the U.S. economy. Other tasks may include data collection and data visualization.

Job Duties and Responsibilities:

With guidance from NREL staff the successful candidate will contribute to the development of data analysis of energy use across U.S. economic sectors. Tasks may include:

- Translating spreadsheet-based calculations into Python methods.
- Implementing new data collection and analysis in Python.
- Working with senior analysts to summarize and communicate results, including data visualization.

R5224 [Solar Researcher Internship: Industry Process Heat Demand](#) An advanced undergraduate/graduate student internship position is available within the National Renewable Energy Laboratory's (NREL) Strategic Energy Analysis Center in our Washington, DC office. NREL is the nation's primary laboratory for research, development and deployment of renewable energy and energy efficiency technologies. The opening is part-time (20 hours per week) during the fall and winter/spring semesters, and continuing through the summer. The successful candidate will work collaboratively with senior analysts on developing data and a novel analysis of the technical and economic potential of solar technologies to meet industry process heating energy demands. Duties may include development of analysis of inputs and methods, technical and economic analysis of solar and energy efficiency technologies, and visualization of analysis results.

Job Duties and Responsibilities:

With guidance from NREL staff the successful candidate will contribute to developing novel analysis of the technical and economic potential of using solar technologies to meet industry process heat demand. Tasks may include:

- Researching, compiling, and analyzing data on process heating unit operations and solar technologies.
- Working with senior analysts and external experts to guide analysis direction.
- Developing foundational analysis code with guidance from senior staff.
- Summarizing the analysis in technical reports.

R5237 [Data Scientist for Materials Science](#) The Data, Analysis and Visualization Group in the NREL Computational Science Center has an opening for a full-time researcher in applied data science methods for materials with an emphasis in machine learning techniques for predictive analytics.

Predictive analytics problems in materials science focus on highly distributed, scalable approaches that can make use of large, complex theoretical and experimental materials databases. Specific areas of interest include: complex feature engineering, property prediction, candidate generation, interpretable AI, and structural decomposition.

NREL is looking for a dynamic, motivated researcher with a strong technical background and an interest in the mission of NREL. The successful candidate will collaborate with NREL staff and researchers, other national labs and universities on efforts to develop data science solutions at scale to real-world problems in renewable energy research. In addition to existing skills, candidates should demonstrate a high degree of curiosity, willingness to learn new skills and ability to adapt to the data needs of differing domains.

R5238 [Postdoctoral Researcher - Data Science for Materials](#)

The Data, Analysis and Visualization Group in the NREL Computational Science Center has an opening for a full-time postdoctoral researcher in applied data science methods for materials with an emphasis in machine learning techniques for predictive analytics.

Predictive analytics problems in materials science focus on highly distributed, scalable approaches that can make use of large, complex theoretical and experimental materials databases. Specific areas of interest include: complex feature engineering, property prediction, candidate generation, interpretable AI, and structural decomposition.

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R5239 [Data Scientist for Systems Analysis](#)

The Data, Analysis and Visualization Group in the NREL Computational Science Center has an opening for a full-time researcher in applied data science methods for systems analysis with an emphasis in machine learning techniques for predictive analytics.

Real time predictive analytics problems in real-world systems focus on highly distributed, scalable approaches that can make use of increasingly available heterogeneous datasets with integration across temporal and spatial scales. Specific fields of application relevant to this position include transportation, smart cities, smart buildings and campuses, grid, internet-of-things (IOT) and industrial IOT.

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R5240

[Postdoctoral Researcher -  
Data Science for Systems  
Analysis](#)

The Data, Analysis and Visualization Group in the NREL Computational Science Center has an opening for a full-time postdoctoral researcher in applied data science methods for systems analysis with an emphasis in machine learning techniques for predictive analytics.

Real time predictive analytics problems in real-world systems focus on highly distributed, scalable approaches that can make use of increasingly available heterogeneous datasets with integration across temporal and spatial scales. Specific fields of application relevant to this position include transportation, smart cities, smart buildings and campuses, grid, internet-of-things (IOT) and industrial IOT.

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R5241 [Postdoctoral Researcher – Virtual Engineering, Simulation and Optimization of Biomass Conversion](#)

The National Renewable Energy Laboratory (NREL) is a leader in the U.S. Department of Energy's effort to secure an energy future that is both environmentally and economically sustainable. With locations in Golden, Boulder and Washington D.C., NREL is the primary laboratory for research, development and deployment of renewable energy technologies in the United States. The NREL mission is to develop renewable energy and energy-efficient technologies and practices, advance related science and engineering, and transfer knowledge and innovation to address the nation's energy and environmental goals.

The Complex Systems Simulation and Optimization Group in the Computational Science Center at NREL has an opening for a full-time postdoctoral researcher to support the development of virtual engineering (VE) capabilities applicable to the conversion of biomass to fuels and chemicals. As part of a team, the candidate will develop a working algorithmic framework and software implementation to simulate an integrated low-temperature conversion process encompassing available computational models for key-process unit operations (e.g., pretreatment, enzymatic hydrolysis, microbial fuel production, product recovery, and residue separation).

Primary Duties Include:

Work with collaborators at NREL and other potential partners (national laboratories, universities, and industry) to identify appropriate programming approaches and software libraries to efficiently implement virtual engineering capabilities.

Develop software to run a fully integrated low-temperature conversion process, including high-fidelity HPC simulations for some unit operations.

Use machine-learning concepts to develop surrogate models for computationally intensive unit-operation models. Consider The Data, Analysis and Visualization group in NREL's Computational Science Center has an immediate opening for a Postdoctoral Computational Scientist to pursue a cross-disciplinary research project in data visualization with an emphasis in uncertainty visualization.

R5250 [Postdoctoral Researcher - Scientific Visualization](#)

The successful candidate will help to develop uncertainty visualizations for decision making in renewable energy systems. This work will include the use of state-of-the-art high-performance parallel computing (HPC) and visualization facilities. The candidate will evaluate and communicate results through written research reports for publication and presentation at seminars, will participate in group meetings and seminars, and will assist in developing grant proposals for new research directions.

R5285 [Visualization Scientist](#)

The Visualization and Analysis group in NREL's Computational Science Center has an immediate opening for a Scientist to pursue cross-disciplinary research projects in scientific visualization with an emphasis in visual analytics and knowledge discovery in large-scale computational data.

The successful candidate will help to develop visualization-based software to model and analyze complex integrated energy systems.

The candidate will integrate visualization software tools with scientific and engineering workflows for decision support and data analysis. These workflows will include the use of state-of-the-art high-performance parallel computing (HPC) and visualization facilities.

The candidate will evaluate and communicate results through written research reports for publication and presentation at seminars, will participate in group meetings and seminars, and will assist in developing grant proposals for new research directions.

The ideal candidate will bring a solid background in scientific visualization, including a working understanding of visual analytics, human-computer interaction, and high-dimensional data visualization techniques.

The candidate should be willing to work in an interdisciplinary field, together with computer scientists, policy analysts, and engineers.

The candidate will possess strong programming and algorithm developments skills and have programming experience in one or more HPC programming and visualization languages (i.e.,

R5325

[Energy System Modeler and Analyst - RII](#)

NREL is the nation's primary laboratory for research, development, and deployment of renewable energy and energy efficiency technologies. Nestled in the foothills of Golden, Colorado, surrounded by grassland, and convenient to Denver, Boulder, and several suburbs, the NREL campus is a living experiment filled with curious researchers and concrete demonstrations of advanced energy technologies (e.g., best-in-class energy efficiency, daylighting, MW-scale solar photovoltaics, buildings heated by computers, optimized electric vehicle charging, hydrogen fueling station). The Economics and Forecasting Group within the National Renewable Energy Laboratory (NREL) has an immediate opening for a power systems modeler and analyst to join a highly interdisciplinary and collaborative team of researchers developing and applying state-of-the-art power system models to conduct leading-edge analyses.

The successful candidate will join a group of researchers studying the drivers of the evolution of power systems at the local, regional, national, and global scale. Working with senior researchers, the candidate will develop and apply capacity expansion models—such as the Regional Energy Deployment System (ReEDS) and the Resource Planning Model (RPM)—to examine the impacts of policy and market conditions on the future of power systems, particularly in the context of high-penetration renewable systems. The candidate will be responsible for a variety of tasks including model development, scenario analysis, communicating results internally and externally through presentations at conferences, workshops, and other professional meetings, and contributing to publications in peer-reviewed journals.

Specific job duties may include:

R5334

[Energy System Engineer and Software Developer](#)

NREL is the nation's primary laboratory for research, development, and deployment of renewable energy and energy efficiency technologies. Nestled in the foothills of Golden, Colorado, surrounded by grassland, and convenient to Denver, Boulder, and several suburbs, the NREL campus is a living experiment filled with curious researchers and concrete demonstrations of advanced energy technologies (e.g., best-in-class energy efficiency, daylighting, MW-scale solar photovoltaics, buildings heated by computers, optimized electric vehicle charging, hydrogen fueling station).

This researcher will conduct research within the Strategic Energy Analysis Center by helping with the development of detailed renewable energy system software models, with a particular focus on engineering enhancements to the System Advisor Model (SAM) suite, including PVWatts. This position requires a candidate with a strong background in both engineering and computer programming and demonstrated interest in renewable energy analysis. With guidance from senior staff, candidate will perform engineering and software development and enhancement of renewable energy system models for the System Adviser Model (SAM) (<http://sam.nrel.gov>) and PVWatts (<http://pvwatts.nrel.gov>). Duties will include programming software for SAM in C++, understanding and improving engineering models for renewable energy system performance (including photovoltaic, battery, wind, and other technology models), data analysis and validation of existing model outputs, publishing technical documentation of modeling processes and techniques, performing basic research to support performance model improvements, as well as performing economic and technical analyses of systems using SAM and other available tools. Role will work with the rest of the development team, as well as internal and external stakeholders. and must have

R5350

[Internship - Energy Modeling and Analysis](#)

An advanced undergraduate/graduate student internship position is available from the National Renewable Energy Laboratory's (NREL) Strategic Energy Analysis Center's Economics and Forecasting Group in our Golden, Colorado office. NREL is the nation's primary laboratory for research, development, and deployment of renewable energy and energy efficiency technologies. The immediate opening is to assist NREL staff in performing modeling and analysis of the U.S. power sector.

The position is for an internship at 40 hours per week. The start and end dates are flexible, but the candidate must commit to working for a minimum of 6 months.

The successful candidate will participate on a broad range of technology, market, and policy analyses that leverage power system modeling tools. Duties may include analysis of power sector policies or regulations, analysis and characterization of power sector scenario results, method development for large-scale electricity sector modeling, and preparing analysis results for publication. For examples of the type of work performed by this group, see <https://www.nrel.gov/analysis/reeds/publications.html>.

R5351

[Website Administration and Deployment Specialist](#)

The High Performance Computing Systems and Operations Group in the Computational Science Center is in need of a talented individual to help deploy, monitor and maintain websites and web services for NREL and DOE. This position involves working with and supporting a diverse range of groups that are creating web content and web applications. These teams will require technical support on configuring, architecting and deploying their websites to run in the AWS cloud. This position is also responsible for monitoring the health and performance of deployed websites.

We have teams of developers and data scientists who are creating cutting-edge web applications and data-driven web platforms to advance sustainable energy research and deployment.

Working with them you will:

Provide the platform and support to deploy web-content to the AWS Cloud

Support deploying web content in Docker images to Docker schedulers

Maintain highly available environments for web hosting

Help build continuous integration pipelines for web projects

Build out automation in other areas as needed to streamline web deployments

Work closely with our cyber team on website security and vulnerability testing

The successful candidate will have experience supporting web servers (Apache, NGINX), web frameworks (Drupal, Django, Flask, Joomla), Docker, AWS ECS or other similar Docker schedulers, Git, Jenkins or other CI/deployment mechanisms, DNS management, web monitoring and Python scripting.

R5358

[Grid Systems Modeler –  
Reliability & Resilience](#)

NREL uses a variety of power systems planning and operations tools to understand the evolution of domestic and international power systems. This position will work with senior researchers to conduct international and domestic energy research and power system analyses, including production cost modeling, wholesale market design, and renewable integration. The ideal candidate has previous experience with power system operations and modeling. Demonstrated strengths in applied mathematics (including statistics), computer programming, and technical writing are also preferred.

The successful candidate will.

Be a subject-matter-expert on planning for worst-case scenarios on the electric grid from a variety of threats.

Design and execute power system planning studies spanning topics of reliability and resilience planning, mitigation strategy development and comparison, and economic benefits calculations.

Participate in the development and execution of models, analysis of results, and publication of results in written reports and spoken presentations.

Communicate with a range of stakeholders, e.g., DOE, energy ministries, utilities, regulators, and private firms.

R5402

[Postdoctoral Researcher -  
Machine Learning and  
Electronic Structure Modeling  
for Simulation of Complex  
Energy Materials and  
Electrocatalysts](#)

The Complex Systems and Optimization Group in NREL's Computational Science Center has an opening for a full-time postdoctoral researcher for machine learning to enable molecular and atomistic simulations of complex energy materials and for application of beyond density functional theory (DFT) electronic structure methods to problems in catalysis. In this position, the candidate will produce software and perform simulations to achieve the overarching goal of developing transferable and chemically aware methods for simulating complex multi-scale systems on leadership class supercomputing resources. In addition, the candidate will simulate electrocatalytic systems including a suite of effects beyond standard DFT calculations: high-fidelity exchange-correlation via the random-phase approximation (RPA), bulk solvation effects, vibrational entropy and zero-point energy, and applied potential. The initial applications will be in the areas of hybrid perovskite materials and catalysis. As a member of the Computational Science Center, the Postdoctoral Researcher also will work with NREL's supercomputing resources, with the opportunity to work on making software and methods useable in a high-performance computing context.

Responsibilities include:

Collaborate with NREL and University researchers to design and implement machine learning algorithms and computational experiments to transferable chemically-aware methods for renewable energy applications, including the implementation and execution of workflows on HPC systems.

Analyze the contributions of different effects (high-fidelity, solvation, vibrations, applied potential) to the reaction pathways and underlying electronic structure of electrocatalysts.

Perform classical and quantum mechanical simulations using established codes. such as LAMMPS. Quantum Espresso.

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