Department of Energy
Department Breakdown
Dream.org
Heron Bridge Education
Miami Climate Alliance

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1. Notes
   1.1. Data pulled from 5/26/2023-7/13/2023, may be subject to change. The Office designation of some programs may be partially representative of the responsible parties for the resource itself.
   1.2. Overview of Categories
      1.2.1. Maps
         1.2.1.1. Maps refers to data primarily displayed in a geographic format/map and may have a data download ability.
      1.2.2. Research and Education
         1.2.2.1. These resources are often toolkits, educational resources with a target audience, or informational resources without a clear administrative purpose.
      1.2.3. Open Data Portals
         1.2.3.1. These are "data warehouses" which will have large amounts of data in various formats or methods of display. These datasets may be available for download or accessible in an accompanying display viewer.
      1.2.4. Downloadable Data and Queryable Tools
         1.2.4.1. These tools are tools that are predominantly tools with a user interface that prepares data and/or a data display in accordance with your specification.
      1.2.5. Software and Models
         1.2.5.1. These resources are software (web-hosted or download dependent) and models that tend to have a specific application with technical documentation and system/data input specifications. Additionally, these resources may be a formatted spreadsheet with accompanying instructions.
      1.2.6. Government Tools
         1.2.6.1. Government tools refers to resources that are for a specific use, but do not clearly fit the other tools and data categories. An example of this is a greenhouse gas footprint calculator, or a tool for locating energystar appliances.
      1.2.7. Policy and Administrative
         1.2.7.1. These resources refer to administrative and policy documents. Examples of this include: strategic plans for the agency, legislation look-up, structure of department information, and definitions of technical terms.

2. Research and Educational Resources
   2.1. WindExchange
      2.1.1. [Wind Energy Education and Training Programs](#)
         2.1.1.1. On the above webpage, a map shows the location of wind energy education and training programs in the United States. Find

programs at community colleges, universities, and other institutions.

2.1.2. [Wind Energy Publications](#)

    2.1.2.1. Find publications about wind energy market sectors, education and workforce development, economic development, siting, policy, wildlife, and other stakeholder engagement and outreach topics. Our database contains publications from the Energy Department, WINDExchange, national laboratories, universities, Regional Resource Centers, and non-profit and state agencies.

2.1.3. [K-12 Resources and Curricula](#)

    2.1.3.1. This page provides a list of wind energy curricula and teaching materials for elementary, middle school, and high school students that can bring wind energy into the classroom, even for students at schools without a wind turbine installation.

2.2. DOE Pages

2.2.1. [U.S. Department of Energy Office of Scientific and Technical Information DOE Pages](#)

    2.2.1.1. The Department of Energy Public Access Gateway for Energy and Science (DOE PAGES) is the DOE discovery tool, developed by the DOE Office of Scientific and Technical Information (OSTI), that makes peer-reviewed scholarly scientific publications resulting from DOE research funding publicly accessible to read, download, and analyze.

    2.2.1.2. DOE PAGES offers free public access to the best available full-text version of DOE-funded scholarly publications - either the peer-reviewed, accepted manuscript or the published scientific journal article - after an administrative interval of 12 months. Over 65,000 publicly available full-text journal articles and accepted manuscripts are currently accessible in DOE PAGES and will continue to grow by about 20,000-30,000 publicly-accessible articles and manuscripts a year.

    2.2.1.3. DOE PAGES leverages the long-established DOE Scientific and Technical Information Program (STIP) infrastructure and systems for collecting, preserving, and disseminating scientific and technical information to collect accepted manuscripts. DOE-funded researchers at national laboratories and grantees at other research institutions use this existing infrastructure to submit metadata and links to accepted manuscripts (or the full-text itself) to OSTI. Researchers at a national lab or other major DOE facility who have a manuscript accepted for publication in a peer-reviewed journal should use their lab's routine processes for scientific and technical information (STI) submission. Metadata/citation information for the journal article should be provided, as well as either an upload of the full-text accepted manuscript or a persistent hyperlink to the accepted manuscript in the lab/site's institutional repository. This procedure is comparable to the long-established

submission process for technical reports and other types of STI. For more detailed instructions, please contact your lab or facility STI point of contact.

2.2.2. About DOE Pages

2.2.2.1. The Department of Energy Public Access Gateway for Energy and Science (DOE PAGES) is the DOE discovery tool, developed by the DOE Office of Scientific and Technical Information (OSTI), that makes peer-reviewed scholarly scientific publications resulting from DOE research funding publicly accessible to read, download, and analyze.

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2.2.2.3. FAQs

2.2.2.3.1. DOE Pages FAQ

2.3. Energy Star

2.3.1. ENERGY STAR Commercial Buildings College Course

2.3.1.1. Interested in teaching your students about building energy efficiency? EPA offers an interactive course that explores the following topics:

2.3.1.1.1. Why energy efficiency matters

2.3.1.1.2. Strategies for overcoming efficiency barriers

2.3.1.1.3. How to benchmark a building using ENERGY STAR Portfolio Manager

2.3.1.2. The content is available from EPA at no cost and is filled with real-world examples and practical, hands-on student activities. Instructors can adapt it to meet their needs and interests, whether integrating it in full or in part into a longer course they already teach, or by designing a new, short course around it.

2.3.1.3. The available content includes an overview document about the course, slide decks for each unit, descriptions of optional assignments, and sample utility bills. The main optional assignment is a project where students apply their learning by going out into their community to benchmark a building using ENERGY STAR Portfolio Manager.

2.4. Better Buildings

2.4.1. Tools Trainings and Resources

2.4.1.1. The Department of Energy works to provide Better Plants partners with helpful tools and resources to overcome barriers and identify opportunities to save energy. Through Better Plants, partners receive support from **Technical Account Managers (TAMs)** who

help facilities develop energy management plans, identify energy-saving opportunities, and track energy performance metrics. In addition to technical guidance, Better Plants partners have access to free tools and software, on-site In-Plant Trainings on various energy savings topics, access to **technical assistance programs**, and more.

2.4.2.   Better Buildings Toolkits

    2.4.2.1.   As noted throughout our resources and program materials, understanding energy, emissions, waste, and water management best practices can help you realize tangible resource and cost-savings benefits that can be reinvested into other areas of a business. We invite you to explore our featured webinars below or explore our broader suite of online learning resources in the **Online Learning Library for Industrial Partners**.

2.4.3.   Technology Information Suites

    2.4.3.1.   Technology Information Suites are designed to help you better understand and overcome technical barriers related to specific technologies. From conduction losses and solar gains in windows to advanced refrigeration technology, these resources give you in-depth insights into the latest technological advances.

2.4.4.   Better Buildings ONLINE LEARNING FOR INDUSTRIAL PARTNERS

    2.4.4.1.   Webinars

        2.4.4.1.1.   Better Buildings partners participate in webinars, peer-exchange calls, meetings, and industry workshops and conferences. Browse upcoming events and opportunities to participate by month.

        2.4.4.1.2.   Better Buildings Events Calendar

        2.4.4.1.3.   OVERVIEW OF DOE ENPI TOOL AND DEMONSTRATION – WEBINAR

            2.4.4.1.3.1.   This webinar walked viewers through how to use the Energy Performance Indicator Tool (EnPI) to develop an energy baseline and track facility-energy performance.

        2.4.4.1.4.   INTRODUCTION TO THE NEW MEASUR TOOL SUITE – WEBINAR

            2.4.4.1.4.1.   This webinar provided viewers with an introduction to DOE's new Manufacturing Energy Assessment Software for Utility Reduction (MEASUR) tool suite and its features and capabilities.

        2.4.4.1.5.   PRE-IN-PLANT TRAINING WEBINAR (PROJECT IMPLEMENTATION AND REPLICATION)

            2.4.4.1.5.1.   This pre-In-Plant Training webinar for the Better Plants Program provided guidance on implementing and replicating energy efficiency opportunities identified by energy assessments.

2.4.5.   Accelerators
    2.4.5.1.   [Better Building Accelerators](#)
        2.4.5.1.1.   Better Buildings Accelerators are designed to demonstrate specific innovative policies and approaches, which will accelerate investment in energy efficiency upon successful demonstration. Each Accelerator is a targeted, short-term, partner-focused activity designed to address persistent barriers that stand in the way of greater efficiency. To learn more about Accelerators, view the **Overview Fact Sheet**. To visit one of our completed Accelerators, **click here**.

2.4.6.   [Home Energy Score](#)
    2.4.6.1.   Developed by DOE and its national laboratories, the Home Energy Score™ provides home owners, buyers, and renters directly comparable and credible information about a home's energy use. Like a miles-per-gallon rating for a car, the Home Energy Score is based on a standard assessment of energy-related assets to easily compare energy use across the housing market. Read more **About the Score** and use this page to guide you to any resources you need whether you are a Home Energy Score Certified Assessor™ (or aspiring Assessor), a homeowner, or a member of the real estate community.

2.4.7.   [E-Learning Center](#)
    2.4.7.1.   Discover online training and education opportunities from the U.S. Department of Energy (DOE) and Better Buildings Affiliates who are working with DOE to promote energy efficiency in U.S. buildings and manufacturing plants. Below is a collection of webinars, courses, and other e-learning resources covering a range of areas relevant to Better Buildings, Better Plants partners. To see all upcoming DOE events, visit the [Events Calendar](#).
    2.4.7.2.   DOE RESOURCES
        2.4.7.2.1.   Better Buildings Webinar Series
            2.4.7.2.1.1.   The [Better Buildings Webinar Series](#) takes on the most pressing topics facing energy professionals, with new experts each month leading the conversations on proven best practices, cost-effective strategies, and innovative new ways to approach sustainability and energy performance. Cost: none | Access: open to public | CEUs: not available | [Register for a Live Webinar](#)
        2.4.7.2.2.   Better Plants Virtual Learning Series
            2.4.7.2.2.1.   The Better Plants team hosted an online learning series with technical presentations on water efficiency, building envelope, compressed air systems, and more! Watch recordings from this series to hear from experts from DOE's national labs and other guest speakers from the Better

Buildings network!
Cost: none | Access: open to public | CEUs: not available | Watch a Previously Recorded Webinar

2.4.7.2.3. On-Demand Webinar Library
2.4.7.2.3.1. In case you missed a live webinar, you can watch all previously recorded webinars in our On-Demand Webinar Library. Webinars are sorted by key topics such as energy data management, financing, resilience, and more.
Cost: none | Access: open to public | CEUs: not available | Watch a Previously Recorded Webinar

2.4.7.2.4. Data Tools Trainings
2.4.7.2.4.1. Watch this series of training webinars to discover how your organization can use DOE building energy data tools to drive energy efficiency. Experts from several national laboratories will describe step-by-step how to access, use, and learn more about these free online resources.
2.4.7.2.4.2. Introduction to Asset Score
2.4.7.2.4.3. Introduction to the Standard Energy Efficiency Exchange Platform (SEED)
2.4.7.2.4.4. Introduction to Audit Template
2.4.7.2.4.5. Introduction to SEED Advanced Features
2.4.7.2.4.6. Introduction to the Building Performance Database (BPD)

2.5. U.S. Department of Energy Office of Science
2.5.1. Public Reusable Research (PuRe) Data
2.5.1.1. Public Reusable Research (PuRe) Data is a designation for key data repositories, knowledge bases, analysis platforms, and other activities that strive to make data publicly available to advance scientific or technical knowledge. Spanning the range of the DOE Office of Science (SC) mission, these data resources include a data center for atmospheric data and model products, data repositories and knowledge bases for biological and environmental research, and a materials database for physical sciences. Each resource is an authoritative provider of data or capabilities in their respective subject area. Together, these high-quality public resources play a strategic role in advancing the SC mission while making data easier to find, access, and reuse across the broader scientific community.
2.5.1.2. Designation as a PuRe Data Resource does more than simply recognize the importance of these investments -- it carries the weight of SC stewardship. SC manages these resources under an oversight model with high standards for data management, resource operations, and scientific impact. The designated PuRe Data Resources go above and beyond the standard SC

requirements for data management plans and act as community leaders in data stewardship.

2.6. Federal Energy Regulatory Commission

    2.6.1. Federal Energy Regulatory Commission eLibrary

        2.6.1.1. eLibrary is a records information system that contains:

        2.6.1.2. Electronic versions of documents issued by FERC from 1989-Present;

        2.6.1.3. Documents received and issued by FERC:

            2.6.1.3.1. A description/index of documents from 1981-Present;

            2.6.1.3.2. Microfilm and aperture cards of documents for 1981-1995;

            2.6.1.3.3. Scanned images of paper documents from 1995-Present; and

            2.6.1.3.4. Native files electronically submitted from November 2000-Present

2.7. Hydrogen Tools

    2.7.1. Hydrogen Safety Training Materials

        2.7.1.1. Training materials publicly available. H2 Tools is intended for public use. It was built, and is maintained, by the Pacific Northwest National Laboratory with funding from the DOE Office of Energy Efficiency and Renewable Energy's Hydrogen and Fuel Cell Technologies Office.

        2.7.1.2. Hydrogen Safety Panel

            2.7.1.2.1. The Hydrogen Safety Panel is multidisciplinary team of engineers, scientist, code officials, safety professions, equipments providers, and testing and certification experts.

        2.7.1.3. Hydrogen Tools Best Practice Overview

            2.7.1.3.1. The purpose of the Hydrogen Safety Best Practices online manual is to share the benefits of extensive experience by providing recommendations pertaining to the safe use and handling of hydrogen. Best Practices have been compiled from a variety of resources, many of which are in the public domain and can be downloaded directly from web pages linked in the documents. The Best Practices are organized under hierarchical categories beginning with those displayed down the left-hand column. Because of the interdependence of the topical areas, individual pages are often accessible via internal links from other pages.

        2.7.1.4. Hydrogen Tools Videos

            2.7.1.4.1. Videos on Hydrogen tools and Hydrogen education.

        2.7.1.5. Technical Reports & White Papers

            2.7.1.5.1. Technical Reports & White Papers

            2.7.1.5.2. Progress Reports

            2.7.1.5.3. Presentations

            2.7.1.5.4. Miscellaneous

2.8.   Energy.gov
    2.8.1.   [Wind Vision Report](#)
        2.8.1.1.   The Wind Vision assesses future wind power growth using a Business-as-Usual framework and sensitivities on key variables such as wind power costs, fossil fuel prices, and electricity demand. This evaluation assists in identifying a credible scenario for further analysis of costs and benefits and in highlighting future actions that could support continued wind growth.

2.9.   U.S. Energy Information Administration
    2.9.1.   [State Energy Data System (SEDS)](#)
        2.9.1.1.   The State Energy Data System (SEDS) is the source of the U.S. Energy Information Administration's (EIA) comprehensive state energy statistics. EIA's goal in maintaining SEDS is to create historical time series of energy production, consumption, prices, and expenditures by state that are defined as consistently as possible over time and across sectors for analysis and forecasting purposes.

2.10.   Oak Ridge National Laboratory and DOE
    2.10.1.   [Environmental Decision Support Toolkit](#)
        2.10.1.1.   The [EDS Toolkit](#) is designed to:
            2.10.1.1.1.   Characterize and summarize the best-available science for use by diverse hydropower stakeholders seeking to better understand potential hydropower project impacts on the riverine ecosystem.
            2.10.1.1.2.   Provide transparent and consistent methodology for identifying and discussing potential environmental impacts during hydropower licensing negotiations.
            2.10.1.1.3.   Point users toward key river function indicators of concern to reduce the time and cost of hydropower licensing negotiations and promote greater certainty in federal authorization processes for hydropower development and relicensing.
        2.10.1.2.   The centerpiece of the EDS Toolkit is an online, interactive, and science-based [River Function Indicator (RFI) Questionnaire](#) that provides stakeholders with a systematic and transparent method for identifying the potential environmental impacts of a hydropower project.
    2.10.2.   [Learning- Hydrosource](#)
        2.10.2.1.   Tutorials
            2.10.2.1.1.   [Stream Classification Explorer Tutorial 1](#)
            2.10.2.1.2.   [Stream Classification Explorer Tutorial 2](#)
        2.10.2.2.   User Manuals
            2.10.2.2.1.   User Manual for Stream Classification
            2.10.2.2.2.   ORNL HydroSource Data Model V1.0
            2.10.2.2.3.   ORNL HydroSource Data Dictionary V1.0

2.11.   [Portal and Repository for Information on Marine Renewable Energy (PRIMRE)](#)

    2.11.1.   PRIMRE provides broad access to information on marine renewable energy (MRE) projects and technologies, engineering, resource characterization, device performance, and environmental effects.

    2.11.2.   [Lessons Learned Collected from the Marine Energy Sector](#)

        2.11.2.1.   The PRIMRE team has conducted 15 semi-structured interviews with U.S. marine energy subject matter experts (in 2020 and 2021). Among the interviewees, three were from academia, eight were from industry (six wave and two tidal developers), and four were from other groups (e.g., consultancies, test centers). Each interview was semi-structured, conversational, and included a blend of closed- and open-ended questions, including:

            2.11.2.1.1.   What worked well/did not work well for the project or project team?

            2.11.2.1.2.   Were there any impacts to the project's timeline?

            2.11.2.1.3.   Were changes in system or subsystem design necessary?

            2.11.2.1.4.   What lessons did you learn that might/might not be applicable to other projects?

        2.11.2.2.   The PRIMRE team conducted all interviews in accordance with the Institutional Review Board requirements for human subjects research. All direct identifiers were removed from interview transcripts by replacing the identifying text (i.e., participant name) with encrypted identifiers. The team then used a spreadsheet to compile de-identified interviewee information and the data collected from each interview (i.e., interviewee's insights organized into distinct quotes).

    2.11.3.   [Levelized Cost of Energy (LCOE) Guidance](#)

        2.11.3.1.   Useful information on calculating the Levelized Cost of Energy (LCOE) and MHK Cost Breakdown Structure is available on the MHKDR.

    2.11.4.   [MHK Instrumentation & Sensor Database](#)

        2.11.4.1.   This database and community is intended for sharing information on MHK instrumentation and lessons learned from laboratory testing and field deployments to help the emerging MHK community achieve greater success in technology development. It is a comprehensive, open and searchable sensor and instrumentation database and community of practice for the international MHK community to contribute and draw information, to openly discuss topics relevant to measurement and testing, and to ask and answer questions.

    2.11.5.   [Marine Energy Projects Database](#)

        2.11.5.1.   The PRIMRE Marine Energy Projects Database provides information on marine energy projects, test sites, devices, and organizations in the U.S. and around the world. The database includes information on wave, current, ocean thermal, and salinity gradient energy. Each of the pages in this database are semantically

linked to one another, creating a rich data structure to explore the relationships between organizations operating in the marine energy sector, their projects, technologies being deployed, and the devices that they are developing.

2.11.6.   MRE Measurements

    2.11.6.1.   This Wiki contains descriptions of the types of measurements typically performed during component, laboratory and field testing of MRE technologies, along with detailed information on types of sensors and instruments, operating principles, sampling requirements, typical data processing, and step-by-step instructions on installation and guidelines for wiring. This wiki also includes sections on measurement planning and data acquisition hardware selection.

2.11.6.2.   Mechanical Loads

    2.11.6.2.1.   Practical information for the implementation of load measurement sensors to ensure the success of a measurement campaign. Here you will find information about load cells and torque transducers. Supplemental information on installation and external references are also provided.

2.11.6.3.   Motion Measurements

    2.11.6.3.1.   Overview of the considerations in selecting motion measurement instrumentation for testing. This will cover the selection of sensors measuring position, displacement, oscillation and acceleration. Sensors described include encoders, inertial measuring units (IMU), GNSS/GPS position units, and MEM accelerometers.

2.11.6.4.   EMI Noise Protection

    2.11.6.4.1.   This guidance draws on the experience of the personnel at NREL's Flatiron Campus have on making high-quality measurements in environments with high electromagnetic interference (EMI). These are recommended guidelines to follow on planning measurements, selecting transducers, and implementation.

2.11.6.5.   Strain Gauges

    2.11.6.5.1.   Strain measurement data is very important for field testing MRE devices. Understanding the loading of mechanical and structural components provides design feedback that can be used to increase reliability, lower manufacturing cost and effectively lower the cost of energy.

2.11.6.6.   Strain Gauge Installation

    2.11.6.6.1.   Procedure for installing strain gages on a polypropylene blade.

2.11.6.7.   Met-Ocean Measurements

    2.11.6.7.1.   Meterological oceanographic (metocean) conditions, instrumentation, and parameters that must be considered for

wave, tidal, and wind energy devices in an offshore environment.

2.11.7.   Explore Marine Energy Performance Metrics

    2.11.7.1.   To adequately analyze Marine Energy (ME) applications and advance ME technologies toward commercialization, relevant performance metrics must be properly assessed. These metrics are a necessary input for evaluating the economic and technical potential of ME technologies, tracking the evolution and growth of ME technologies, and guiding ME research and development and programs. These metrics can provide invaluable insights for developers and energy professionals, however if they are applied with unwarranted optimism or excessive conservatism, they will give misleading and erroneous results. These metrics must be applied objectively without bias to be useful.

    2.11.7.2.   This page provides information about commonly used metrics to evaluate ME systems. The metrics guidance serves as a reference for relevant information concerning ME systems.

2.11.8.   Marine Renewable Energy Educational Resources

    2.11.8.1.   As we combat climate change, marine renewable energy (MRE) has the potential to play an important role. However, we need to understand the impact tidal, wave, and ocean thermal energy devices may have on the environment in order to deploy MRE devices in a responsible manner.

    2.11.8.2.   OES-Environmental has compiled educational resources to increase awareness and understanding of MRE and associated environmental effects as well as support the future workforce.

    2.11.8.3.   The materials and resources on this page can be used by students of all ages and educational backgrounds. Educators, schools, aquariums and zoos, science camps, etc. may also want to use this page for fun, educational content or to develop a classroom curriculum on environmental effects of MRE.

2.11.9.   Webinars for Marine and Wind Energy and the Environment

    2.11.9.1.   Tethys hosts regular webinars pertaining to topics of environmental concern, as a means to effectively disseminate new information and research efforts to a large international audience of stakeholders. Anyone is welcome to attend these live webinars and participate in a live question and answer session with the presenters. Information for attending these live webinars is distributed to a public mailing list (separate lists for wind and water). Ongoing webinars on Tethys are sponsored by OES-Environmental and WREN.

2.11.10.   Office of Energy Efficiency and Renewable Energy

    2.11.10.1.   Solar Energy Resource Center

        2.11.10.1.1.   The Solar Energy Resource Center contains information resources to help local and state governments implement best practices when deploying solar. This searchable

database includes case studies, how-to guides, model rules and ordinances, webinars, and other tools that were created by DOE partners at local governments, national laboratories, and universities.

2.11.10.1.2.   This page has:

2.11.10.1.2.1.   Solar Energy Resources for Consumers
2.11.10.1.2.2.   Solar Energy Resources for Professionals
2.11.10.1.2.3.   Solar Energy Resources for Government Officials
2.11.10.1.2.4.   Solar Energy Resources for Job Seekers

2.11.10.2.   Building America Solution Center

2.11.10.2.1.   The Building America Solution Center provides access to expert information on hundreds of high-performance construction topics, including air sealing and insulation, HVAC components, windows, indoor air quality, and much more.

2.11.10.2.2.   Welcome to our new homepage! The Building America Solution Center provides access to expert information on hundreds of high-performance construction topics, including air sealing and insulation, HVAC components, windows, indoor air quality, and much more. Click on the links below, or the navigation in the upper right of the website to explore the Solution Center.

2.11.10.2.3.   This page has:

2.11.10.2.3.1.   Building Components
2.11.10.2.3.2.   Code Briefs
2.11.10.2.3.3.   Guides A-Z
2.11.10.2.3.4.   Library
2.11.10.2.3.5.   Sales Tool
2.11.10.2.3.6.   Climate Packages
2.11.10.2.3.7.   Disaster Resistance
2.11.10.2.3.8.   Program Checklists
2.11.10.2.3.9.   Existing Homes
2.11.10.2.3.10.   Home Improvement Expert™
2.11.10.2.3.11.   Website Widget
2.11.10.2.3.12.   Mobile Apps

2.11.10.3.   Hydrogen and Fuel Cell Database

2.11.10.3.1.   The Hydrogen and Fuel Cell Database has information resources to help you learn more about hydrogen—and Increase Your H2IQ!—as well as course materials and links to additional information for safety and code officials, state and local government representatives, potential end users, and students and educators of all levels.

2.11.10.3.2.   This page has:

2.11.10.3.2.1.   Visit the Increase Your H_2IQ page to view downloadable fact sheets and other introductory resources on hydrogen technologies.

2.11.10.3.2.2. The State of the States reports provide a snapshot of fuel cell and hydrogen activity in the 50 states and District of Columbia. The annual reports include state-by-state details about policies and funding, recent and planned fuel cell and hydrogen installations, and recent activity by state industry and universities.

2.11.10.4. Building Energy Codes Training Courses

2.11.11. DOE Office of State and Community Energy Programs

2.11.11.1. State and Local Solution Center

2.11.11.1.1. The State and Local Solution Center helps states, local governments, and K-12 schools take clean energy to scale in their communities using a searchable database based on four key action areas or by topic and/or resource type. Action areas include in depth information on how to develop a clean energy strategy, design and implement clean energy programs, pay for clean energy, and access and use energy data.

2.11.11.2. Weatherization Management Resources

2.11.11.2.1. The U.S. Department of Energy's Weatherization Assistance Program (WAP) provides weatherization professionals with program updates, video trainings, and comprehensive tools to assist in the implementation of state and local programs.

2.11.11.2.2. Program Updates

2.11.11.2.2.1. Review program initiatives, important program procedures, and new tools. Access training videos and files.

2.11.11.2.3. Weatherization Training Resources

2.11.11.2.3.1. Download training tools developed specifically for the WAP network.

2.11.11.2.4. Allocation Formula

2.11.11.2.4.1. Learn about the background of the allocation formula and how it works.

2.11.11.2.5. Rules and Regulations

2.11.11.2.5.1. Learn about federal rules and regulations that give programs guidelines to provide the energy efficiency improvements to low-income dwellings.

2.11.11.2.6. Energy Audit Tools

2.11.11.2.6.1. Learn more about the audit tools approved for use in the WAP.

2.11.11.2.7. WAP Monitoring

2.11.11.2.7.1. Learn more on how WAP monitors the work to ensure high-quality work and energy savings for each client.

2.11.11.2.8.   Field Guides & Variance Requests
    2.11.11.2.8.1.   Review protocol required of Weatherization Grantees to meet quality work plan requirements with regard to field standards.

2.11.11.3.   State & Local Energy Efficiency Action Network
    2.11.11.3.1.   The State & Local Energy Efficiency Action Network offers publications, events, and technical assistance to state and local decision makers as they provide low-cost, reliable energy to their communities through energy efficiency.
    2.11.11.3.2.   Learn more about SEE Action activities related to the following policies and programs below:
        2.11.11.3.2.1.   Grid-Interactive Efficient Buildings
        2.11.11.3.2.2.   Energy Efficiency Financing
        2.11.11.3.2.3.   Evaluation, Measurement, and Verification
        2.11.11.3.2.4.   Energy Efficient as a Least-Cost Strategy to Reduce Greenhouse Gases and Air Pollution and Meet Energy Needs in the Power Sector
        2.11.11.3.2.5.   Industrial Energy Efficiency
        2.11.11.3.2.6.   Combined Heat and Power
        2.11.11.3.2.7.   Ratepayer-Funded Efficiency through Regulatory Policy
        2.11.11.3.2.8.   Commercial and Public Building Efficiency Behavior-Based Energy Efficiency
        2.11.11.3.2.9.   Energy Use Data Access
        2.11.11.3.2.10.   Residential Energy Efficiency

2.12.   Joint Office of Energy and Transportation
    2.12.1.   Find Data and Tools
        2.12.1.1.   Explore foundational data sets, tools, and resources to deploy zero-emission, convenient, accessible, and equitable transportation infrastructure.
        2.12.1.1.1.   Explore Funding Opportunities
        2.12.1.1.2.   As part of a suite of technical assistance resources, the Joint Office of Energy and Transportation connects stakeholders with critical data and tools. These resources will expand over time to meet evolving needs. Initially, this suite of resources is aimed to help transportation stakeholders deploy electric vehicle (EV) charging infrastructure by:
            2.12.1.1.2.1.   Providing foundational data sets, including installed chargers and designated corridors
            2.12.1.1.2.2.   Helping states discover information independently
            2.12.1.1.2.3.   Enabling the market to expand using core capabilities from the U.S. Department of Energy and the U.S. Department of Transportation
            2.12.1.1.2.4.   Addressing gaps in existing data sets and tool requirements

2.12.1.1.2.5.   Facilitating connections among states with EV charging experts

2.12.2.   Publications
   2.12.2.1.   Find reports and publications affiliated with the Joint Office of Energy and Transportation and its mission to support the deployment of zero-emission, convenient, accessible, and equitable transportation infrastructure.

2.12.3.   Webinars
   2.12.3.1.   The Joint Office of Energy and Transportation offers webinars to help states and key stakeholders build capacity for electric vehicles and plan for charging infrastructure.

2.12.4.   Technical Assistance Resources by Audience
   2.12.4.1.   States and Communities
      2.12.4.1.1.   Resources to connect state and community stakeholders with critical data and tools
   2.12.4.2.   Tribal Nations
      2.12.4.2.1.   Resources for tribal nations navigating transportation electrification
   2.12.4.3.   School Districts
      2.12.4.3.1.   Resources that can help school districts plan for and deploy clean school buses
   2.12.4.4.   Transit Agencies
      2.12.4.4.1.   Resources that can help transit fleets plan for and deploy clean transit buses

3.   Policy and Administrative

3.1.   WindExchange
   3.1.1.   Wind Energy Policies and Incentives
      3.1.1.1.   Federal, state, and local regulations govern many aspects of wind energy development. The nature of the project and its location will largely drive the levels of regulation required. Check the DSIRE database of federal and state renewable energy policies and incentives.
      3.1.1.2.   Wind energy ordinances adopted by counties, towns, and other types of municipalities are one of the best ways for local governments to identify conditions and priorities for all types of wind development. These ordinances regulate aspects of wind projects such as their location, permitting process, and construction. The standards specified in ordinances provide clarity to wind developers and the public. Ordinances may also address issues of community impact such as: land use, noise standards, and safety.
      3.1.1.3.   The WINDExchange ordinances database is a collection of U.S. wind energy ordinances at the state and local levels; it is not exhaustive.

3.2. Hydrogen Tools
    3.2.1. Codes and Standards Resources
        3.2.1.1. https://h2tools.org/fuel-cell-codes-and-standards?search_api_fulltext=
        3.2.1.2. Codes and standards provide the information needed to safely build, maintain, and operate equipment, systems, and facilities. They help ensure uniformity of safety requirements and give local inspectors and safety officials the information they need to approve systems and installations.
        3.2.1.3. In the United States, Codes are requirements for the built environment – buildings and facilities. They are generally adopted by local jurisdictions, thereby achieving the force of law. Codes often refer to or invoke standards for the equipment used within the given built environment.
        3.2.1.4. Standards in the United States are rules, guidelines, conditions, or characteristics for products or related processes, and generally apply to equipment or components. Although they're not regulations, standards achieve a regulation-like status when they are referred to in codes or through other government regulations.
        3.2.1.5. Although hydrogen has been used in industry for decades, its use as a fuel for vehicles or stationary power generation in consumer environments is relatively new. As such, hydrogen and fuel cell codes and standards are in various stages of development. Industry, manufacturers, the government, and other safety experts are working with codes and standards development organizations to prepare, review, and promulgate technically-sound codes and standards for hydrogen and fuel cell technologies and systems. Codes and standards are being adopted, revised, or developed for vehicles; fuel delivery and storage; fueling, service, and parking facilities; and vehicle fueling interfaces. Codes and standards are also being adopted, revised, or developed for stationary and portable fuel cells and interfaces, as well as hydrogen generators.
    3.2.2. Safety Planning Resources & Reviews
        3.2.2.1. Safe practices in the production, storage, distribution, and use of hydrogen are essential to protect people, equipment, and the environment. A catastrophic failure in any project could damage the public's perception of hydrogen and fuel cells and prevent its widespread acceptance. An effective project safety plan is essential to identify risks, avoid potential incidents, and guide the safe conduct of all work related to the development and operation of hydrogen and fuel cell equipment.
    3.2.3. Hydrogen Equipment Certification Guide
        3.2.3.1. This Guide has been developed to assist code officials, designers, owners, evaluators and others with the application of the listing and approval requirements pertinent to the design and/or installation of hydrogen equipment as regulated by the model

codes. Enables designers, users and code officials to better apply the requirements where the use of listed, labeled, certified or approved equipment or methods is required and to increase awareness and understanding of what the equipment is expected to do.

3.3.   Better Building Program

    3.3.1.   [50001 Ready Program](#)

        3.3.1.1.   The U.S. Department of Energy's 50001 Ready program recognizes facilities and organizations that attest to the implementation of an ISO 50001-based energy management system. The program is a self-paced, no-cost way for organizations to build a culture of structured energy improvement that leads to deeper and sustained savings that does not require any external audits or certifications. 50001 Ready partners with utilities and other organizations that support and facilitate the implementation of 50001 Ready energy management systems. **[Find out more about continuous energy improvement and 50001 Ready >>](#)**

        3.3.1.2.   [The 50001 Ready Navigator](#) is an online application that provides step-by-step guidance for implementing and maintaining an energy management system in conformance with the ISO 50001 Energy Management System Standard. Join the 23,000+ sites worldwide benefiting from an energy management system!

    3.3.2.   [SEP 50001 Program](#)

        3.3.2.1.   Facilities or organizations that achieve sustained excellence using their energy management systems (EnMS) may get certified to the Superior Energy Performance 50001™ (SEP 50001™) program and achieve elevated levels of DOE recognition.

    3.3.3.   [Waste Reduction Network](#)

        3.3.3.1.   Manufacturers, companies, schools, and governments across the country are looking to strengthen their competitiveness and sustainability by setting and realizing ambitious waste reduction goals. By reducing waste, these organizations also save energy. More efficient use of materials and higher recycling reduces the amount of energy needed to transport and treat waste as well as indirect GHG emissions. To facilitate waste reduction the Department of Energy's (DOE) Better Buildings, Better Plants Waste Reduction Network brings industry-leading organizations together to demonstrate successful approaches to waste management.

    3.3.4.   [Water Savings Network](#)

        3.3.4.1.   Prioritizing water efficiency is a necessary response to the risks of climate change, particularly in water-stressed regions. The efficient use of water saves both money and energy while improving resilience. Through the Better Buildings Water Savings Network, DOE brings organizations together to discuss and demonstrate successful approaches to conserving water in buildings, plants, and

multifamily housing. All facility owners and managers are invited to build on the progress already made by Better Buildings Challenge partners who have set water intensity goals and reduced their water use by more than 10 billion gallons since 2015.

3.3.5. Workforce Development

    3.3.5.1. Through Better Buildings, DOE works with organizations to support and grow our energy efficiency workforce by connecting to training, education, and job opportunities. We have collected resources, information, and other materials to help you address your workforce needs and take the next step toward an impactful career in energy efficiency.

    3.3.5.2. Each of the sections below includes content that can be used by both individuals looking to further their career paths and organizations looking to strengthen their current workforce.

3.4. National Conference of State Legislatures

3.4.1. State Statutes on Wind Facility Siting

    3.4.1.1. Provides a searchable database of all state statutes, including links. Developed by the National Conference of State Legislatures.

3.5. U.S. Energy Information Administration

3.5.1. Survey

    3.5.1.1. All survey forms used by EIA to collect energy data are listed below. The forms include descriptions and links to survey instructions and additional information.

3.6. Portal and Repository for Information on Marine Renewable Energy (PRIMRE)

3.6.1. PRIMRE provides broad access to information on marine renewable energy (MRE) projects and technologies, engineering, resource characterization, device performance, and environmental effects.

3.6.2. MRE Testing

    3.6.2.1. Overview

        3.6.2.1.1. A summary of the benefits of a comprehensive and incremental testing regime including a description of the different testing levels and the importance of high-quality data.

    3.6.2.2. Test Planning

        3.6.2.2.1. Information for planning laboratory and field tests, including a summary of the testing process and risk assessments that will help improve test effectiveness and value. A test plan template and samples are shared to help create a test plan that meets accepted practices at many test facilities.

    3.6.2.3. Stability and Seakeeping

        3.6.2.3.1. Overview of stability and seakeeping tests, which are used to characterize the behavior of a floating marine energy converter (MEC) when it is subject to waves and other metocean conditions.

3.6.2.4.   Power Testing
    3.6.2.4.1.   For power producing MECs, power tests are essential because they quantify how much power is generated and the properties of that power. Information is provided on power performance and power quality testing including applicable standards and references.

3.6.2.5.   Mooring
    3.6.2.5.1.   Information on mooring tests, which are used to characterize the mooring properties and the loads in the mooring system once the MEC is on station and connected to its station keeping system.

3.6.3.   Regulations, Standards, Guidelines and Certification
    3.6.3.1.   Overview
        3.6.3.1.1.   Introduces the distinctions between regulations, standards, guidelines, and certification. Provides a figure depicting their relationship with examples of each.

    3.6.3.2.   Regulations
        3.6.3.2.1.   Explains state, federal, and international oceanic jurisdiction as they apply to MRE development. Lists relevant regulations from the CFR, FAA, and U.S. Coast Guard.

    3.6.3.3.   Standards
        3.6.3.3.1.   Defines and provides examples for IEC, ISO, API, and offshore industry standards.

    3.6.3.4.   Guidelines
        3.6.3.4.1.   Defines and provides examples for ABS and DNVGL guidelines.

    3.6.3.5.   Certification
        3.6.3.5.1.   Differentiates type certifications and project certifications, and illustrates each device certification process.

3.7.   Office of Energy Efficiency and Renewable Energy
    3.7.1.   Laws and Incentives
        3.7.1.1.   Federal and state laws and incentives from the Alternative Fuels Data Center related to alternative fuels and vehicles, air quality, fuel efficiency, and other transportation-related topics

3.8.   Federal Energy Regulatory Commission
    3.8.1.   Hydropower Permitting Resources
        3.8.1.1.   The Federal Energy Regulatory Commission's Hydropower Permitting Resources contain information on the issuance of licenses for the construction of a new project, relicensing, and oversight of all ongoing project operations, including dam safety inspections and environmental monitoring.

3.9.   National Renewable Energy Laboratory
    3.9.1.   Geothermal Regulatory Roadmap
        3.9.1.1.   The Geothermal Regulatory Roadmap is a working guide for agency, industry and policymaker use in an effort to understand

regulatory processes and timelines and identify potential areas of concern.

3.9.1.2.   Navigating the complex system of federal and state regulations and permits can be one of the biggest hurdles geothermal developers face. The Geothermal Regulatory and Permitting Information Desktop Toolkit offers a solution.

3.9.1.3.   Information on this page:

3.9.1.3.1.   Regulations and Permitting

3.9.1.3.1.1.   Regulatory and permitting information by jurisdiction, including comparisons between jurisdictions

3.9.1.3.2.   Reference Library

3.9.1.3.2.1.   A collection of links to regulatory and permitting documents, regulations, and tools available on other websites

3.9.1.3.3.   Best Practices

3.9.1.3.3.1.   A collection of best practices for efficiently permitting renewable energy and bulk transmission projects

3.9.1.3.4.   NEPA Database

3.9.1.3.4.1.   A collection of document sets and details from past NEPA analyses

4.   Maps

4.1.   WindExchange

4.1.1.   Wind Energy Maps and Data

4.1.1.1.   Find maps and charts showing wind energy data and trends.

4.2.   U.S. Energy Atlas

4.2.1.   The U.S. Energy Atlas is a comprehensive reference for data and interactive maps of energy infrastructure and resources in the United States.

4.2.2.   Energy Disruptions

4.2.2.1.   Visit EIA's U.S. Energy Atlas, our new interface for web map applications and geospatial data catalogue.

4.2.2.1.1.   HURRICANES, CYCLONES AND TYPHOONS MAP

4.2.2.1.1.1.   Energy infrastructure and live hurricanes, cyclones and typhoons data feeds.

4.2.2.1.2.   FLOODING MAP

4.2.2.1.2.1.   Energy infrastructure and live flooding data feeds.

4.2.2.1.3.   WILDFIRES MAP

4.2.2.1.3.1.   Energy infrastructure and live wildfire data feeds.

4.2.3.   All Energy Infrastructure and Resources

4.2.3.1.   This map includes all energy infrastructure and resources layers. The All Energy Infrastructure web mapping application is a map of all U.S. energy infrastructure that EIA has available in geospatial format. The map enables users to visualize the geospatial location of various energy infrastructure assets and explore attribute data on

individual features. The data layers are developed by U.S. Energy Information Administration or from other publicly available data.

4.3. National Renewable Energy Laboratory

    4.3.1. The Innovative Data Energy Applications (IDEA) group in NREL's Strategic Energy Analysis Center (SEAC) is a multi-disciplinary collection of UX Researchers, Product Owners, and Software Engineers. We care about producing useful software that facilitates a clean energy transition and we tackle complex data architecture problems and create delightful user experiences. Our end products enhance NREL's research and analysis capabilities and our applications empower users to leverage complex data and make well-informed decisions. Take a moment to explore our featured applications below.

    4.3.2. Featured Products:

        4.3.2.1. SLOPE

            4.3.2.1.1. The SLOPE Data Viewer is designed to deliver modeled energy data resolved at state and local jurisdictional levels. Users can explore energy data potential and projections to better understand opportunities and options in energy planning. Population and building area data provide metrics to enable quantifiable goal setting.

            4.3.2.1.2. State and Local Planning for Energy (SLOPE) Platform: Integrates dozens of distinct sources of energy efficiency, renewable energy, and sustainable transportation data and analyses to enable more data-driven state and local decision making. These data include offshore wind at the state level and land-based wind at the state and county levels.

        4.3.2.2. RE Data Explorer

            4.3.2.2.1. The RE Data Explorer is a user-friendly geospatial analysis tool for analyzing renewable energy potential and informing decisions. Developed by the National Renewable Energy Laboratory (NREL) and supported by the U.S. Agency for International Development (USAID), RE Data Explorer performs visualization and analysis of renewable energy potential that can be customized for different scenarios. RE Data Explorer can support prospecting, integrated planning, policymaking, and other decision-making activities to accelerate renewable energy deployment.

        4.3.2.3. Marine Energy Atlas

            4.3.2.3.1. Explore marine energy resources and potential in the United States. Data in the Atlas includes wave energy, tidal, ocean, riverine current, and ocean thermal. View resource variable, including peak wave period, tidal, and ocean energy currents.

4.3.2.4.   Customer Damage Function Calculator
      4.3.2.4.1.   The Customer Damage Function (CDF) Calculator is a resource for facility owners and resilience planners to understand the costs of an electric grid outage at their site. The calculator provides a process to elicit facility outage vulnerabilities and estimates how costs vary with outage duration.
      4.3.2.4.2.   The CDF calculator is the first step in determining the potential avoided costs associated with resilience investments, such as calculating the resilience benefits of a redundant system, providing justifications for investments for enhancing energy security and informing decision-making based on the cost of inaction.

4.3.2.5.   National Solar Radiation Database
      4.3.2.5.1.   The National Solar Radiation Database (NSRDB) is a serially complete collection of hourly and half-hourly values of meteorological data and the three most common measurements of solar radiation: global horizontal, direct normal and diffuse horizontal irradiance.
      4.3.2.5.2.   It covers the United States and a growing subset of international locations. These data have been collected at a sufficient number of locations and temporal and spatial scales to accurately represent regional solar radiation climates. For a given location covered by the dataset, it is possible to see the amount of solar energy that was at a given time, and to predict the potential future availability of solar energy based on past conditions.

4.3.2.6.   Lithium Story Map
      4.3.2.6.1.   Provides and interactive and informative journey showcasing the significance of lithium in advancing clean energy technologies and its connection to geothermal resources.

4.3.2.7.   Tribal Energy Atlas
      4.3.2.7.1.   The Tribal Energy Atlas is an interactive mapping tool that provides data to conduct energy related analysis on tribal lands. Tribes can use the Atlas to understand their current energy baseline and analyze potential options.
      4.3.2.7.2.   Data sets include:
            4.3.2.7.2.1.   Renewable energy resource potential on tribal lands
            4.3.2.7.2.2.   Existing energy infrastructure
            4.3.2.7.2.3.   Tribal land boundaries
            4.3.2.7.2.4.   End user energy costs

4.3.2.8.   Electric Vehicle Registration Counts by State
      4.3.2.8.1.   Map and data from the Alternative Fuels Data Center showing the density of light-duty vehicles per state based on registration counts and a trend over time

4.4.	U.S. Department of the Interior, U.S. Geological Survey, Supported by the Energy Resources Program

4.4.1.	United States Wind Turbine Database

4.4.1.1.	Allows users to discover and learn more about wind turbine sites throughout the United States. This database was jointly funded by the U.S. Department of Energy Wind Energy Technologies Office via the Lawrence Berkeley National Laboratory Electricity Markets and Policy Group, the U.S. Geological Survey Energy Resources Program, and the American Wind Energy Association.

4.5.	Oak Ridge National Laboratory and DOE

4.5.1.	Standard Modular Hydropower (SMH) Explorer

4.5.1.1.	The SMH Explorer is a geo-visual analytics platform to inform Standard Modular Hydropower (SMH) need and design

4.5.2.	HydroSource Data Explorer

4.5.2.1.	Oak Ridge National Laboratory's (ORNL) HydroSource is an integrated energy, water, and ecosystem research and geospatial data integration effort for efficient, sustainable, and environmentally friendly hydroelectricity generation and water management. HydroSource is sponsored by the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy (EERE) and our partners include state and federal agencies, non-governmental organizations, technology and resource developers, utilities, and researchers. For more HydroSource information, please visit: hydrosource.ornl.gov.

4.5.3.	NPD Explorer and NPDamCAT

4.5.3.1.	The NPD Explorer App provides an open-ended sandbox environment that allows users to sift through data layers, build up maps, graphics, and tables, and then deconstruct those visualizations and explore information in diverse ways. Through an interactive map interface, data are primarily displayed geographically and users can filter to locations based on desired characteristics. The focus of the NPD Explorer is non-powered dams, however, the app also includes select environmental, hydrological, and infrastructure data that can be viewed alongside the non-powered dams (and their design, operational, socioeconomic, and environmental characteristics).

4.5.3.2.	The NPDamCAT App walks users through the process of filtering and organizing dams into a taxonomy, effectively classifying or sorting dams into groups based on individual preferences and available data. This app can help determine how many dams meet certain criteria or where data are unavailable for a certain group and enables comparisons of the size and make-up of groups of dams.

4.5.4.	HydroGIS Explorer

4.5.4.1.	The HydroGIS Viewer is an interactive web map funded by the Department of Energy's (DOE) Water Power Technologies Office

(WPTO) and developed by Oak Ridge National Laboratory (ORNL) to support U.S. hydropower market acceleration. Registered users may view and query geospatial distributions and characteristics of various key datasets developed through ORNL's National Hydropower Asset Assessment Program (NHAAP). These data include information on:

4.5.4.1.1. Existing hydropower assets;

4.5.4.1.2. New Stream-reach Development potential;

4.5.4.1.3. New development potential at non-powered dams;

4.5.4.1.4. Summarized environmental conservation layers;

4.5.4.1.5. Environmental mitigations for hydropower development;

4.5.4.1.6. Hydrology and climate information;

4.5.5. U.S. Stream Classification System (USSCS)

4.5.5.1. A tool to group 2.6 million stream reaches of the Conterminous United States

4.5.5.2. The Stream Classification Web App provides a platform for stakeholders, regulators, and the hydropower industry to explore, visualize, and query stream classes.

4.5.5.2.1. First, the app provides users an ability to conduct an inventory of hydrologic regimes, thermal regimes, size, gradient, and valley geomorphology of rivers within a region or basin. In doing so, the streams can be used to identify ideal environmental conditions.

4.5.5.2.2. Second, the app can be used to search for reference streams or case studies meeting search criteria. Thus, the app is expected to increase the effectiveness of the hydropower regulatory process by creating an objective and data-rich means to address meaningful mitigation actions.

4.6. Western Association of Fish & Wildlife Agencies Crucial Habitat Assessment Tool

4.6.1. The Western Association of Fish & Wildlife Agencies Crucial Habitat Assessment Tool (CHAT)® delivers data-driven solutions to provide a non-regulatory, decision support system of state fish and wildlife agency priorities to aid the proactive decision-making process during pre-planning stages.

4.6.2. As of 01/01/2023, the CHAT is sunset as a WAFWA Initiative The CHAT state representatives have determined on a state-by-state basis if the CHAT data for their state will be archived or remain an active representation of state priorities. This is represented on the map.

4.7. Argonne National Laboratories and Partners

4.7.1. EISPC Energy Zones Study

4.7.1.1. Energy Zones Mapping Tool

4.7.1.1.1. Identifies potential energy resource areas and energy corridors in the United States.

4.7.2.   Geospatial Energy Mapper (GEM)
    4.7.2.1.   Geospatial Energy Mapper (GEM) is a next-generation modeling tool built on the core data and capabilities of the Energy Zones Mapping Tool (EZMT). GEM features an improved user interface, updated data, and additional capabilities. Argonne National Laboratory hosts the tool with funding from the U.S. Department of Energy (DOE) Office of Electricity.
4.7.3.   Transportation Equity Analysis
    4.7.3.1.   Tools and resources from Argonne National Laboratory that support transportation energy equity analysis
    4.7.3.2.   Transportation connects people to jobs, family, healthcare, shopping, and more. Access and affordability, however, are not equitable. When mobility—the very capability that enables access to job opportunities and other necessities—is limited, disadvantages compound rapidly for those affected.
    4.7.3.3.   To address these problems, Argonne analysts examine the intersection of energy and advanced transportation and mobility technologies. In addition to expertise in alternative fuels, vehicle life-cycle analysis, and the employment impacts of installing advanced fueling infrastructure (such as electric vehicle charging equipment), the group analyzes the costs and environmental benefits of transportation technologies and modes of mobility. Additionally, Argonne's in-depth analysis includes quantifying—for all U.S. census tracts—the following:
        4.7.3.3.1.   Transportation energy burden (e.g., percentage of household income spent on transportation energy [fuel])
        4.7.3.3.2.   Transportation accessibility (e.g., number of necessities and amenities accessible within a given travel time by driving, transit, or walking)
        4.7.3.3.3.   Cost of vehicle ownership ($/mile)
        4.7.3.3.4.   Transportation emissions (e.g., ozone and particulate matter)
4.8.   Bureau of Land Management
    4.8.1.   West-Wide Wind Mapping Project
        4.8.1.1.   Maps wind energy resources on public lands and identifies existing land use exclusions and other potential resource sensitivities that may affect wind energy development opportunities.
4.9.   Playa Lakes Joint Venture
    4.9.1.   Playa Maps and Tools
        4.9.1.1.   PLJV has developed a set of online resources and tools to help bring playas and their connection to the Ogallala aquifer to life for farmers, ranchers, resource managers, and others throughout the region — starting with outreach materials.

4.10. Bureau of Ocean Management and National Oceanic and Atmospheric Administration (BOEM/NOAA) PARTNERSHIP

    4.10.1. OceanReports

        4.10.1.1. Allows users to draw a custom area anywhere in U.S. waters or pick from a predefined list of locations to get instant custom reports. Reports include infographics and supporting data that can be used for offshore planning, permitting, environmental review, public relations, and more. Created by the Department of the Interior's Bureau of Ocean Energy Management and the Department of Commerce's National Oceanic and Atmospheric Administration.

4.11. U.S. Energy Information Administration

    4.11.1. U.S. Energy Information Administration Data, Tools, Maps, and Apps

        4.11.1.1. The U.S. Energy Information Administration (EIA) collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment.

    4.11.2. New England Dashboard

        4.11.2.1. In January 2019, the U.S. Energy Information Administration (EIA) introduced the interactive, daily New England Energy Dashboard (NED) showing energy market conditions in New England to help users examine many key aspects of the New England energy market. These key aspects include

            4.11.2.1.1. Fuel diversification

            4.11.2.1.2. Wholesale price volatility

            4.11.2.1.3. Energy delivery dynamics

            4.11.2.1.4. Weather's effect on operations

            4.11.2.1.5. Electricity prices' effect on fuel prices

            4.11.2.1.6. Regional and on-site fuel stocks

        4.11.2.2. NED integrates our view of the energy commodities—natural gas, electricity, and petroleum products—and factors that can influence energy consumption, prices, flows, and energy security in New England. The dashboard includes detailed regional information on

            4.11.2.2.1. Temperatures

            4.11.2.2.2. Various fuel prices

            4.11.2.2.3. Locational marginal prices

            4.11.2.2.4. Electric grid status, outages, and available capacity

            4.11.2.2.5. Current and projected load

            4.11.2.2.6. Liquefied natural gas (LNG) imports

            4.11.2.2.7. Electricity generation fuel mix

            4.11.2.2.8. Interregional electricity transmission and natural gas flows

            4.11.2.2.9. Petroleum product stocks

        4.11.2.3. Energy delivery infrastructure constraints and outages can have a pronounced influence on New England's wholesale energy prices,

energy flows, and operations. As a result, NED illustrates these constraints, including

  4.11.2.3.1. Nuclear generating capacity availability

  4.11.2.3.2. Real-time locational marginal prices by Independent Service Operator New England (ISO-NE) zone and electric interface

  4.11.2.3.3. Electricity generation outages and reductions

  4.11.2.3.4. A map indicating natural gas pipeline capacity use at key flow points

4.11.3. SOUTHERN CALIFORNIA DAILY ENERGY REPORT

  4.11.3.1. EIA's new dashboard, the Southern California Daily Energy Report, shows how electricity and natural gas are being managed in Southern California following the discovery of the leak at the Aliso Canyon natural gas storage facility in October 2015. The dashboard includes important information that EIA regularly collects about energy operations in Southern California. EIA updates the report at about 10:00 a.m. every morning.

4.11.4. State Energy Profiles

  4.11.4.1. Energy Information Administration State Energy Profiles contain comprehensive state energy statistics, including information on prices, fuels and emissions. Energy Information Administration state power plant data is available in the electricity data browser under "Change Data Set" and "Plant Level Data."

4.12. Office of Energy Efficiency and Renewable Energy

4.12.1. EV Charging Justice40 Map

  4.12.1.1. Tool from Argonne National Laboratory providing interactive maps of disadvantaged communities.

  4.12.1.2. As part of DOT's work in implementing the Justice40 Initiative, the Department developed an interim definition for disadvantaged communities ("DACs") that may be used under Justice40-covered grant programs. In order to help grant applicants determine whether the locations of their proposed projects were in a DAC, the Department created a mapping tool, which went live on Jan. 28, 2022. The Department subsequently conducted a data review and found that the mapping tool had data errors affecting approximately 11% of U.S. Census tracts. The NEVI Mapping tool was updated on May 17, 2022 to reflect the correct data.

5. Open Data Portals

5.1. U.S. Energy Information Administration

5.1.1. Open Data

  5.1.1.1. The U.S. Energy Information Administration is committed to its free and open data by making it available through an Application Programming Interface (API) and its open data tools. EIA's API is multi-faceted and contains the following time-series data sets organized by the main energy categories.

5.2. National Renewable Energy Laboratory and Department of Energy

    5.2.1. OpenEI Data

        5.2.1.1. OpenEI is a trusted source of energy data, specifically for renewable energy and energy efficiency. Users can view, edit, add, and download data for free. Interested in contributing data? We invite you to get involved. With your help, we can provide the most current information needed to make informed decisions on energy, market investment, and technology development. Your data may also help create new businesses, build innovative tools and inspire new analyses.

5.3. Northeast Regional Ocean Council

    5.3.1. Northeast Ocean Data Portal:

        5.3.1.1. Provides user-friendly access to maps, data, tools, and information needed by government entities, non-government organizations, and ocean stakeholders to support ocean planning, management, and decision making from Long Island Sound to the Gulf of Maine. Developed by the Northeast Regional Planning Body.

5.4. Portal and Repository for Information on Marine Renewable Energy (PRIMRE)

    5.4.1. PRIMRE provides broad access to information on marine renewable energy (MRE) projects and technologies, engineering, resource characterization, device performance, and environmental effects.

    5.4.2. Marine and Hydrokinetic Data Repository U.S. DEPARTMENT OF ENERGY

        5.4.2.1. The MHKDR is the repository for all data collected using funds from the Water Power Technologies Office of the U.S. Department of Energy (DOE).

        5.4.2.2. The goal of the MHKDR

            5.4.2.2.1. Enable an easy data upload process to help with reporting requirements

            5.4.2.2.2. Provide a curation process to allow internal data experts to help evaluate the quality of the data

            5.4.2.2.3. Keep secure data secure (based on moratorium dates)

            5.4.2.2.4. Securely share data with DOE and partner laboratories

            5.4.2.2.5. Openly share data with the public

    5.4.3. Tethys Engineering

        5.4.3.1. Tethys Engineering is a knowledge base that collects, curates, and makes publicly available documents on engineering and technologies associated with marine renewable energy. Sponsored by the US Department of Energy, Tethys Engineering is part of the PRIMRE system, and is designed after the Tethys Knowledge Base.

        5.4.3.2. Knowledge Base

            5.4.3.2.1. The Knowledge Base provides access to information about technical and engineering aspects of marine renewable energy. Relevant documents from around the world are compiled into a user-friendly table that displays all content

available in Tethys Engineering. Results can be narrowed using the keyword filters on the right, or with search terms entered in the text box, including targeted searches (e.g., org:DOE, author:polagye). Content may also be sorted alphabetically by clicking on column headers. Some entries will appear on the next page.

5.4.4. Hydrodynamic Testing Facilities Database

    5.4.4.1. By viewing Testing and Expertise Facilities in the list accompanying the map, one will be provided with data on a range of test capabilities and services available at commercial, academic, and government facilities and offshore berths within the United States.

5.5. Office of Energy Efficiency and Renewable Energy

    5.5.1. Alternative Fuel Data Center

        5.5.1.1. The Alternative Fuel Data Center provides information, data, and tools such as the Plug-In Vehicle Readiness Scorecard to help fleets and other transportation decision makers find ways to reduce petroleum consumption through the use of alternative and renewable fuels, advanced vehicles, and other fuel-saving measures.

        5.5.1.2. Electricity Sources and Emissions Tool

            5.5.1.2.1. Tool from the Alternative Fuels Data Center that shows how a state's electricity generation sources affect life cycle emissions for light-duty vehicles

6. Government Tools

6.1. Pacific Northwest National Laboratory

    6.1.1. Tethys

        6.1.1.1. Tethys, named after the Greek titaness of the sea, was developed in 2009 by the Pacific Northwest National Laboratory (PNNL) to support the U.S. Department of Energy (DOE) Wind Energy Technologies Office and Water Power Technologies Office. The primary functions of Tethys are twofold:

            6.1.1.1.1. To facilitate the exchange of information and data on the environmental effects of marine and wind energy technologies; and

            6.1.1.1.2. To serve as a commons for marine and wind energy practitioners and therefore enhance the connectedness of the renewable energy community as a whole.

        6.1.1.2. The growing body of content in Tethys is actively collected and curated by researchers at PNNL from a variety of sources. Members of the community are also encouraged to contribute to Tethys by identifying documents not yet in the collection.

    6.1.2. Risk Retirement

        6.1.2.1. Risk retirement is a term used loosely by the marine renewable energy (MRE) community to describe a means of simplifying consenting processes for single or small numbers of devices by

focusing on key issues of concern. Risks that are unlikely to cause harm to marine animals or habitats can be "retired" so that extensive investigations at every new MRE project are not required. Rather, MRE developers and regulators may rely on what is known from already consented projects, from related research studies, or from findings from analogous offshore industries.

6.1.2.2. Risk retirement does not take the place of any existing regulatory processes, nor does it completely replace the need for all data collection before and after MRE device deployment; these data are needed to verify risk retirement findings and add to the overall knowledge base. When larger arrays of MRE devices are planned, or when new information comes to light, these risks can be revisited and new decisions about the level of risk down-scoping or retirement can be made.

6.1.3. Monitoring Datasets Discoverability Matrix

6.1.3.1. The monitoring datasets discoverability matrix (matrix) is an interactive tool that classifies monitoring datasets from already consented (or permitted) marine renewable energy (MRE) projects and research studies for six key environmental stressors. The goal of the matrix is to allow regulators, developers, and the larger marine renewable energy community to easily discover datasets from already consented projects that can be used to aid consenting processes for future MRE projects (see data transferability page for more information).

6.1.4. Management Measures Tool for Marine Energy

6.1.4.1. The Management Measures Tool for Marine Energy shows management (or mitigation) measures from past or current MRE projects as a reference to help manage potential risks from future projects and allow them to move forward in the face of uncertainty, or until a risk can be retired. Additional management measures are regularly added by the OES-Environmental team. In addition to the searchable tool below, the information can be downloaded here. The download file includes additional details not shown below, including comments from stakeholders on past experience, cost of management measures, and when a management measure is needed.

6.1.5. Regulatory Frameworks for Marine Renewable Energy

6.1.5.1. The following information on regulatory frameworks is intended to provide an overview of country-specific requirements for environmental review and permitting (consenting) of marine renewable energy devices (specifically wave and tidal). This information is intended for general purposes only and should not be construed as legal advice or a legal opinion. It does not represent a complete record of the regulatory requirements for a given country, nor is it correct to assume that all the authorizations necessarily apply to all marine renewable energy projects.

6.1.6.   Wind Energy Monitoring and Mitigation Technologies Tool
 6.1.6.1. As part of its mission to support the global deployment of wind energy through a better understanding of environmental issues, WREN has created a free, online tool to catalog monitoring and mitigating technologies developed to assess and reduce potential wildlife impacts resulting from land-based and offshore wind energy development. WREN will continuously maintain and update the research status of technologies to ensure the international community has access to current, publicly available information on monitoring and mitigation solutions, their state of development, and related research on their effectiveness.

6.1.7.   Tethys Knowledge Base
 6.1.7.1. The Knowledge Base provides access to documents and information about the environmental effects of wind and marine renewable energy, supporting the OES-Environmental and WREN initiatives. Relevant documents from around the world are compiled into a user-friendly table that displays all content available in Tethys. Results can be narrowed using the keyword filters on the right, or with search terms entered in the text box, including targeted searches (e.g., org:DOE, author:copping). Content may also be sorted alphabetically by clicking on column headers. Some entries will appear on the next page.

 6.1.7.2. Knowledge Base

6.2.   Department of Energy

6.2.1.   DOE Patents
 6.2.1.1. DOE Patents, developed by the U.S. Department of Energy (DOE) Office of Scientific and Technical Information (OSTI), is a search tool for discovering patent information resulting from DOE-funded research and development (R&D). Included here are patents that DOE sponsored through a variety of funding mechanisms, including grants, contracts, or cooperative agreements. DOE Patents provides comprehensive coverage of patents resulting from DOE funding, one way to demonstrate the Department's contribution to scientific progress in the physical sciences and other disciplines. Publicly available patent information from DOE R&D, historic and current, is presented here, excluding patent applications. DOE Patents consists of bibliographic records, with full text where available, either via a PDF file or an HTML link to the record at the United States Patent and Trademark Office (USPTO).

 6.2.1.2. About DOE Patents
  6.2.1.2.1. DOE Patents, developed by the U.S. Department of Energy (DOE) Office of Scientific and Technical Information (OSTI), is a search tool for discovering patent information resulting from DOE-funded research and development (R&D). Included here are patents that DOE sponsored

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6.2.1.2.2. DOE Patents provides comprehensive coverage of patents resulting from DOE funding, one way to demonstrate the Department's contribution to scientific progress in the physical sciences and other disciplines. Publicly available patent information from DOE R&D, historic and current, is presented here, excluding patent applications. DOE Patents consists of bibliographic records, with full text where available, either via a PDF file or an HTML link to the record at the United States Patent and Trademark Office (USPTO).

6.2.1.2.3. DOE Patents FAQs

6.2.1.3. DOE Patents Developer Tools

6.2.1.3.1. DOE Patents offers an API to provide the ability to search and retrieve record metadata in flexible formats such as XML and JSON. The API is built on a REST architecture, providing predictable URLs that make writing applications easy. DOE Patents API documentation can be found here.

6.2.2. DOE Data Explorer

6.2.2.1. The DOE Data Explorer (DDE) is the Office of Scientific and Technical Information's (OSTI) search tool for finding DOE-funded, publicly available, scientific data submitted by data centers, repositories, and other organizations funded by the Department.

6.2.2.2. The data themselves reside at national laboratories, data centers, user facilities, colleges and universities, or other websites.

6.2.2.3. Use Search functionalities to discover publicly available, DOE-funded data resources. For more information about DDE or its content please visit our FAQs or contact us.

6.2.2.4. DOE Data Services and Development Tools

6.2.2.4.1. The Office of Science and Technical Information (OSTI) offers data services and developer tools to ensure that DOE researchers have efficient access to the research and development (R&D) information they need to speed the pace of discovery. OSTI offers two data services for assigning digital object identifiers (DOIs) to data objects to help increase access to scientific research data - the DOE Data ID Service and the Interagency DOI Service (IAD). Through the tools and services below, we aim to provide data support for records available on DOE Data Explorer.

6.2.2.5. Navigating DOE Data Explorer Video Tutorial

6.2.2.6. DOE Data Explorer FAQs

6.2.3. DOE Code

6.2.3.1. DOE CODE is the software services platform and search tool that allows for scientific and business software to be provided to the

U.S. Department of Energy (DOE). The DOE Office of Scientific and Technical Information (DOE OSTI) developed DOE CODE, providing functionality for collaboration, archiving, and discovery of scientific and business software. DOE OSTI is charged with fulfilling the Department's responsibilities to collect, preserve, and disseminate scientific and technical information (STI), including software, emanating from DOE research and development activities. In addition to DOE OSTI's charge for scientific software, the Office of the Chief Information Officer (OCIO) and DOE OSTI partnered to leverage DOE CODE to maintain a comprehensive inventory of DOE-funded custom-developed business software. In accordance with the Office of Management and Budget Memorandum M-16-21, Federal Source Code Policy: Achieving Efficiency, Transparency, and Innovation through Reusable and Open Source Software, DOE CODE fulfills requirements to maintain an inventory of all DOE-funded custom-developed software and to report this inventory to the government-wide Code.gov website.

6.2.3.2. Through DOE CODE, the Department of Energy (DOE) Office of Scientific and Technical Information (OSTI) offers DOE-funded developers and researchers both public and private software/code repository service options:

6.2.3.2.1. Developers can use the OSTI GitHub repository to develop or host open source projects.

6.2.3.2.2. Developers can use the internal DOE CODE GitLab instance to develop or host projects needing controlled access.

6.2.3.2.3. Both of these repository services are optional and separate from the submission process of software/code to DOE CODE.

6.2.3.3. DOE Code Policy

6.2.3.3.1. DOE CODE is the software services platform and search tool that allows for scientific and business software to be provided to the U.S. Department of Energy (DOE). The DOE Office of Scientific and Technical Information (DOE OSTI) developed DOE CODE, providing functionality for collaboration, archiving, and discovery of scientific and business software. DOE OSTI is charged with fulfilling the Department's responsibilities to collect, preserve, and disseminate scientific and technical information (STI), including software, emanating from DOE research and development activities.

6.2.3.3.2. In addition to DOE OSTI's charge for scientific software, the Office of the Chief Information Officer (OCIO) and DOE OSTI partnered to leverage DOE CODE to maintain a comprehensive inventory of DOE-funded

custom-developed business software. In accordance with the Office of Management and Budget Memorandum M-16-21, Federal Source Code Policy: Achieving Efficiency, Transparency, and Innovation through Reusable and Open Source Software, DOE CODE fulfills requirements to maintain an inventory of all DOE-funded custom-developed software and to report this inventory to the government-wide Code.gov website.

6.2.3.4.   DOE Code Resources

6.2.3.4.1.   Videos & Tutorials
6.2.3.4.2.   API Documentation
6.2.3.4.3.   Community and Best Practices
6.2.3.4.4.   DOE CODE GitHub site
6.2.3.4.5.   Code.gov
6.2.3.4.6.   The Better Scientific Software Portal
6.2.3.4.7.   Semantic Versioning
6.2.3.4.8.   Force11 Software Citation Implementation Principles

6.2.3.5.   DOE Code About

6.2.3.5.1.   The Department of Energy (DOE) Office of Scientific and Technical Information (OSTI) developed a new DOE software services platform and search tool for DOE-funded code – DOE CODE. DOE CODE provides functionality for collaboration, archiving, and discovery of scientific and business software. DOE CODE replaces OSTI's old software center, the Energy Science and Technology Software Center (ESTSC).

6.2.3.6.   DOE Code FAQs

6.2.4.   DOE Science Cinema

6.2.4.1.   DOE ScienceCinema is a multimedia search tool provided by the Department of Energy (DOE) Office of Scientific and Technical Information, with video and audio files produced by DOE National Laboratories, other DOE research facilities, and the European Organization for Nuclear Research (CERN). By using innovative, state-of-the-art audio indexing and speech recognition technology from IBM Watson to allow users to quickly find video and audio files, DOE ScienceCinema delivers the precision searching already common in text-based databases. Users can search for specific words and phrases, and precise snippets of the video where the search term was spoken will appear along with a timestamp. This may also be combined with standard metadata searching through the advanced search feature. Users may then select a snippet or a segment along the timestamp to begin playing the video at the exact point in the video where the words were spoken. This feature is offered inline on the search results page, or on individual records pages to search the content of the selected video. Over 3,000 speech-indexed videos are currently available in DOE

ScienceCinema, and the database will continue to grow as new R&D-related videos produced by DOE Laboratories and other research facilities are added to the collection.

6.2.4.2. About DOE ScienceCinema

6.2.4.2.1. DOE ScienceCinema is a multimedia search tool provided by the Department of Energy (DOE) Office of Scientific and Technical Information, with video and audio files produced by DOE National Laboratories, other DOE research facilities, and the European Organization for Nuclear Research (CERN). By using innovative, state-of-the-art audio indexing and speech recognition technology from IBM Watson to allow users to quickly find video and audio files, DOE ScienceCinema delivers the precision searching already common in text-based databases. Users can search for specific words and phrases, and precise snippets of the video where the search term was spoken will appear along with a timestamp. This may also be combined with standard metadata searching through the advanced search feature. Users may then select a snippet or a segment along the timestamp to begin playing the video at the exact point in the video where the words were spoken. This feature is offered inline on the search results page, or on individual records pages to search the content of the selected video. Over 3,000 speech-indexed videos are currently available in DOE ScienceCinema, and the database will continue to grow as new R&D-related videos produced by DOE Laboratories and other research facilities are added to the collection.

6.2.4.3. DOE ScienceCinema FAQs

6.2.5. DOE Pages

6.2.5.1. Developer Tools

6.2.5.1.1. DOE PAGES® offers an API to provide the ability to search and retrieve record metadata in flexible formats such as XML and JSON. The API is built on a REST architecture, providing predictable URLs that make writing applications easy. DOE PAGES API documentation can be found here.

6.2.5.1.2. To improve the discoverability of publications across federal agency repositories, a list of APIs (including the DOE PAGES API) and other services provided by each agency can be found on Science.gov. These agency APIs simplify programming, help to support application interoperability, and facilitate the machine-to-machine discovery of public access content by third parties and additional real-time search offerings.

6.3.   National Renewable Energy Laboratory

    6.3.1.   Renewable Energy Integration and Optimization (REopt™) Tool

        6.3.1.1.   Identifies and prioritizes renewable energy projects at a single site or across a portfolio of sites in multiple cities, states, or countries, each with its own energy requirements, resources, goals, and constraints. A new distributed wind module in the REopt™ Lite web tool helps building and facility managers better analyze energy demand data, evaluate on-site energy generation and resilience options, and estimate energy generation and storage system costs at commercial properties.

    6.3.2.   Data and Tools

        6.3.2.1.   Explore data, models, and tools that help state, local, and tribal governments make informed decisions about energy policy, planning, and projects. Find additional data sets and tools on NREL's comprehensive data and tools listing and on the NREL Data Catalog.

6.4.   U.S. Energy Information Administration

    6.4.1.   Tools in Development

        6.4.1.1.   Projects published on Beta are not final and may contain programming errors. They are for public testing and comment only. We welcome your feedback. For final products, please visit www.eia.gov

6.5.   Better Buildings

    6.5.1.   WASTEWATER ENERGY DATA MANAGEMENT

        6.5.1.1.   Energy data management is the foundation of strong energy management and planning in which facilities measure and track their energy performance to inform their decisions about infrastructure improvements. The resources below provide guidance on energy data management in the sector:

    6.5.2.   Energy Data Management Manual

        6.5.2.1.   This manual describes the benefits of energy data management and provides step-by-step guidance for tracking and managing energy performance. The manual highlights the Data Tool Comparison Matrix, also included in this toolkit, produced during SWIFt to help facilities select a data management tool that is best suited to their needs.

    6.5.3.   Combined Heat & Power Resource Center

        6.5.3.1.   The Combined Heat & Power Resource Center contains information on transforming the market for CHP, waste heat to power, and district energy with CHP technologies and concepts throughout the United States.

        6.5.3.2.   This page has:

            6.5.3.2.1.   Packaged CHP eCatalog

                6.5.3.2.1.1.   The Packaged Combined Heat and Power Catalog (eCatalog) is a voluntary public/private partnership designed to increase deployment of CHP in

buildings and manufacturing plants.

6.5.3.2.2. CHP Installation Database

6.5.3.2.2.1. The U.S. Department of Energy's CHP Installation Database contains a comprehensive listing of CHP installations throughout the United States.

6.5.4. CHP Project Databases

6.5.4.1. COMBINED HEAT AND POWER (CHP) PROJECT PROFILES DATABASE

6.5.4.1.1. In this database, more than 200 CHP Project Profiles compiled by DOE's CHP Technical Assistance Partnerships (TAPs) can be searched by a variety of characteristics.

6.5.4.1.2. Customize your search for CHP project profiles using the fields below. CHP project profiles have been compiled by the DOE Combined Heat and Power Technical Assistance Partnerships (CHP TAPs).

6.6. Windexchange

6.6.1. WINDExchange provides resources to help communities weigh the benefits and impacts of wind energy.

6.6.2. Offshore Wind Energy

6.6.2.1. The U.S. offshore wind energy project pipeline has reached a total of 40 gigawatts (GW) of capacity, including the operational 30-megawatt (MW) Block Island Wind Farm and the 12-MW Coastal Virginia Offshore Wind pilot project. Eighteen projects in the U.S. offshore pipeline have reached the permitting phas, and eight states have set their own offshroe wind energy procurement goals, which total 40 GW by 2040. See a summary of state offshore renewable energy activities, and learn about the six new lease areas auctioned in New York Bight, two new lease areas auctioned in Carolina Long Bay, and plans to lease new areas in California, Gulf of Mexico, Central Atlantic, Oregon, and Gulf of Maine. Globally, pipeline

6.6.2.2. In 2021, the Biden administration announced efforts to reach 30 GW of offshore wind energy capacity by 2030. The U.S. Department of Energy's Wind Vision Report quantified the benefits from up to 22 gigawatts of installed offshore wind by 2030 and 86 gigawatts by 2050. In fact, the Wind Vision scenarios show that by 2050, offshore wind energy could be available in all coastal regions nationwide.

6.6.2.3. Despite the fact that projects planned for U.S. waters often face unique planning, siting, and permitting challenges, interest in developing offshore wind energy exists in coastal areas because of the proximity of offshore wind resources to population centers, the potential for local economic development benefits, and superior wind resources.

6.6.2.4. Included resources provide additional information about offshore, utility-scale wind energy.

6.6.3. Land-Based Wind Energy

6.6.3.1. The United States has vast resources of land-based, utility-scale wind energy. As of December 2021, the United States has an installed capacity of about 136 gigawatts (GW) of land-based wind energy, which is enough to power 29 million American homes each year. However, according to estimates based on current wind turbine technologyPDF, the country has more than 10,000 GW of potential wind energy at 80-meter hub heights.

6.6.3.2. In addition, the Energy Department report Enabling Wind Power Nationwide finds that taller wind turbine towers of 110 and 140 meters with larger rotors can more efficiently capture the stronger and more consistent wind found at greater heights, compared with 80-meter wind turbine towers typically installed today.

6.6.3.3. Included resources provide additional information about land-based, utility-scale wind.

6.6.4. Community Impacts of Wind Energy

6.6.4.1. Neighbors of existing or proposed wind projects may have questions about the turbines or development. Topics of potential concern include sound; shadow flicker; radar, TV, and radio signal interference; and impacts to other uses or industries. Before making decisions regarding whether a wind project installation is appropriate in a given location, it is important to assess these potential impacts. A properly sited wind project can coexist within the community with minimal intrusion.

6.6.4.2. Siting issues are typically addressed during the planning process, during which the developer uses computerized tools and experience gained from the more than 71,000 wind turbines installed in the United States to evaluate impacts relative to the site and the surrounding community. The siting process, including detailed community dialogue, should identify measures that may be required to minimize or mitigate any problems identified. Although the potential impacts will vary by project, WINDExchange provides credible information for landowners, community decision-makers, and the interested public about siting topics.

6.6.5. Current News and Events

6.6.5.1. Find the latest news and events about wind energy technologies from WINDExchange presented as webinars, events, news articles, success stories, lessons learned, and podcasts.

6.6.6. Wildlife Impacts of Wind Energy

6.6.6.1. As with all energy projects, wildlife impacts from wind project development vary by location. The wind industry incorporates pre- and post-development studies, educated siting, and other impact reduction tools to decrease wildlife impacts.

6.6.6.2. Research shows that wind projects actually rank near the bottom of the list of developments that negatively impact wildlife and the environment. In fact, the Audubon Society strongly supports properly sited wind power as a renewable energy source that helps reduce the threat posed to birds and people by climate change.

6.6.6.3. For wind energy to continue to be a sustainable resource, it is vital that wind power projects are appropriately and responsibly sited, which includes the protection of wildlife and their habitat. Industry, government agencies, and wildlife advocates come together in various ways to collaborate on these issues.

6.7. Office of State and Community Energy Programs

    6.7.1. Low-Income Energy Affordability Data Tool

        6.7.1.1. Tool from the U.S. Department of Energy that provides estimates of low-income and moderate-income household energy data

        6.7.1.2. The Low-Income Energy Affordability Data (LEAD) Tool was created to help stakeholders understand housing and energy characteristics for low- and moderate-income households. Using data, maps, and graphs from the LEAD Tool, stakeholders can make data-driven decisions when planning for their energy goals.

        6.7.1.3. LEAD Tool Resources

            6.7.1.3.1. LEAD Tool Factsheet

            6.7.1.3.2. LEAD Tool Methodology

            6.7.1.3.3. LEAD Tool Raw Dataset

            6.7.1.3.4. LEAD Tool Video Tutorial

            6.7.1.3.5. Presentation: LEAD Tool Use-Cases Webinar

6.8. Joint Office of Energy and Transportation

    6.8.1. NEVI U-Finder

        6.8.1.1. NEVI U-Finder (Prompts Download)

        6.8.1.2. A networking tool for EV charging infrastructure installation that helps states, communities, and fleets by providing lists of local utility partners and incentives.

        6.8.1.3. Database helps federal agencies connect to electric vehicle supply equipment (EVSE) utility partners and incentives active in an agency ZIP Code. Primary EV U-Finder outputs include the utilities operating in the ZIP Code, utility contacts, and incentives offered by those utilities.

    6.8.2. AFLEET Emissions Tool

        6.8.2.1. The AFLEET Charging and Fueling Infrastructure (CFI) Emissions Tool estimates well-to-wheel greenhouse gas emissions and vehicle operation air pollutant emissions for proposals to the Federal Highway Administration's (FHWA) Charging and Fueling Infrastructure Discretionary Grant Program (CFI Program). The CFI Program covers electric vehicle charging, as well as hydrogen, propane, and natural gas fueling infrastructure.

        6.8.2.2. This tool was developed with the support of the Joint Office of Energy and Transportation, using the AFLEET Tool available at:

https://greet.es.anl.gov/afleet. The AFLEET Tool uses emissions data from both the EPA's MOVES and Argonne's GREET models.

6.8.2.3. Assess estimated emissions reductions from EV charging infrastructure along designated alternative fuel corridors

6.8.3. EV-Charging Analytics Reporting Tool

6.8.3.1. The Joint Office of Energy and Transportation maintains the Electric Vehicle Charging Analytics and Reporting Tool (EV-ChART), which provides a centralized hub for submitting electric vehicle (EV) charging infrastructure data directed by the Federal Highway Administration (23 CFR 680.1121) EV-ChART will provide a streamlined data submission process and an integrated set of analytic tools, connect to other data sources, and empower data sharing and access across stakeholders, including the public. Any data shared publicly will be aggregated and anonymized to stay in accordance with 23 CFR 680.

6.8.3.2. The Joint Office of Energy and Transportation is developing the Electric Vehicle Charging Analytics and Reporting Tool (EV-ChART), which provides a web-based centralized hub for submitting electric vehicle (EV) charging infrastructure data under 23 CFR 680.112. Data submissions to EV-ChART must follow the reporting standards outlined in EV-ChART Data Format and Preparation Guidance and follow the format of the accompanying EV-ChART Data Input Template.

6.8.3.3. EV-ChART is scheduled to launch in early 2024.

6.8.3.4. EV-ChART Pilot Group Participation

6.8.3.4.1. The Joint Office seeks to establish a pilot group of EV-ChART users that will help to refine the functionality and user experience of the tool. Members of this pilot group will provide their feedback on EV-ChART features and capabilities, including testing the data submission process and/or providing mock data. They may participate in individual and/or group discussions to help shape the development and future operation of EV-ChART. Participants may be asked to review prototypes, concepts, and new features and provide feedback on how EV-ChART user needs and goals are addressed.

6.8.3.4.2. If you are interested in participating in the EV-ChART pilot group, contact the Joint Office at ashlee.vise@nrel.gov.

7. Downloadable Data and Queryable Tools

7.1. Oak Ridge National Laboratory

7.1.1. HydroSource

7.1.1.1. A comprehensive and unique National Energy-Water digital platform designed to help the hydropower community make data driven decisions

that operate the grid. We publish hourly operating data for individual BAs exactly as we receive these reported data. Hourly U.S. and regional aggregations and all daily data aggregations follow procedures to manage anomalous values of some data elements. We advise caution when using these data.

7.2.13.   International Data

 7.2.13.1.   Information on International Data Usage such as:

  7.2.13.1.1.   Petroleum and Other Liquids

  7.2.13.1.2.   Natural Gas

  7.2.13.1.3.   Coal and coke

  7.2.13.1.4.   Hydrocarbon Gas Liquids

  7.2.13.1.5.   Biofuels

  7.2.13.1.6.   Electricity

  7.2.13.1.7.   Total Energy

  7.2.13.1.8.   Other Statistics

8.   Models and Software

8.1.   National Renewable Energy Laboratory

8.1.1.   System Advisor Model (SAM)

 8.1.1.1.   Assists with decision-making for people involved in the renewable energy industry through performance and financial modeling. SAM makes performance predictions and cost of energy estimates for grid-connected power projects based on installation and operating costs and system design parameters that the model user specifies.

8.1.2.   Regional Energy Deployment System Model

 8.1.2.1.   Simulates the evolution of the bulk power system, generation and transmission, from present day through 2050 or later.

8.1.3.   Renewable Energy Potential (reV) Model

 8.1.3.1.   Empowers users to calculate renewable energy capacity, generation, and cost based on geospatial intersection with grid infrastructure and land-use characteristics.

8.1.4.   Distributed Generation Market Demand (dGenTM) Model

 8.1.4.1.   Allows users to simulate U.S. customer adoption and use of solar, wind, and storage technologies through 2050 at site-specific, state, and national levels.

8.1.5.   Wind Prospector

 8.1.5.1.   Helps developers view high-level siting issues with large-scale wind farms by providing easy access to GIS-based wind resource datasets and other data relevant to siting wind power projects. Wind developers gather their own wind speed and other information at project locations throughout the development process.

8.1.6.   Electric Vehicle Infrastructure Modeling Suite

 8.1.6.1.   Tools from the National Renewable Energy Laboratory that inform the development of large-scale EV charging infrastructure deployments

8.2.   WindExchange
    8.2.1.   [Jobs and Economic Development Impacts (JEDI) Models](#)
        8.2.1.1.   Estimates economic impacts from power projects. Models for wind power include distributed wind, utility-scale wind, and offshore wind.
    8.2.2.   [Small Wind Economic Model](#)
        8.2.2.1.   Warning Prompts download
        8.2.2.2.   Allows users to estimate the performance and economics of potential distributed wind turbine projects, with a focus on certified residential turbines.

8.3.   Office of Energy Efficiency and Renewable Energy
    8.3.1.   [ENPI](#)
        8.3.1.1.   The Energy Performance Indicator Tool (EnPI) V5.1.5 is a regression analysis-based tool developed by the U.S. Department of Energy's Advanced Manufacturing Office (AMO). The tool applies to businesses whether in the manufacturing sector, commercial buildings, federal agencies, data centers, or beyond.
        8.3.1.2.   Plant and corporate managers use this tool to:
            8.3.1.2.1.   Establish a normalized baseline of energy consumption;
            8.3.1.2.2.   Calculate EnPIs that account for variations due to weather, production, and other variables;
            8.3.1.2.3.   Track annual progress of intensity improvements and energy savings;
            8.3.1.2.4.   Calculate cost savings and avoided CO_2 emissions
            8.3.1.2.5.   Calculate metrics for a single facility, multiple facilities within a corporation, or enterprise-wide.
            8.3.1.2.6.   Corporate energy managers can roll plant level energy data and metrics up to a corporate level to determine corporate energy performance.
            8.3.1.2.7.   Calculate metrics required by DOE programs: Better Plants, Better Plants Program and Challenge Partners, 50001 Ready, and Superior Energy Performance 50001 (SEP 50001). Metrics required for Better Plants reporting are formatted to enable easy entry into the annual report form. For SEP 50001, the tool calculates SEnPIs, cumulative improvement, and annual improvement/normalized energy savings.
        8.3.1.3.   [Getting Started: Energy Performance Indicator (EnPI)](#)
    8.3.2.   [WindView](#)
        8.3.2.1.   Extends the planning capabilities of power system operators and increases their understanding of the dynamics that drive their unique energy systems. Learn more about this wind power forecast visualization tool created by DOE's National Renewable Energy Laboratory and Argonne National Laboratory, along with the University of Texas-Dallas.

8.4.   Renewable Energy Bird and Bat Mortality and Visualization Programs

    8.4.1.   [A Generalized Estimator for Estimating Bird and Bat Mortality at Renewable Energy Facilities - GenEst](#)

        8.4.1.1.   GenEst

            8.4.1.1.1.   Provides unbiased estimates of mortality to inform development and operational decisions and allow meaningful comparisons across time, sites and regions

            8.4.1.1.2.   Is easy to use

            8.4.1.1.3.   Provides easy-to-interpret results

        8.4.1.2.   GenEst does not require

            8.4.1.2.1.   Changes to monitoring protocols

            8.4.1.2.2.   Increased monitoring effort

            8.4.1.2.3.   New prescriptive monitoring objectives

        8.4.1.3.   GenEst allows end-users to test assumptions regarding input parameters and select an approach that best reflects their situation and data. Flexible parameter inputs allow GenEst to yield statistically valid, unbiased results across a wide spectrum of study designs with greatly reduced potential for user error.

        8.4.1.4.   GenEst provides

            8.4.1.4.1.   Guidance on study design to increase efficiency and reduce costs of fatality studies

            8.4.1.4.2.   Information with which to meaningfully interpret regional impacts and temporal trends

            8.4.1.4.3.   A way to standardize carcass searches and perform data analyses

            8.4.1.4.4.   Reduction of bias to improve accuracy of fatality estimates, or rates, generated from carcass searches

    8.4.2.   [Bat Acoustic Monitoring Visualization Tool](#)

        8.4.2.1.   This application is a companion to the Bat Acoustic Monitoring Portal (BatAMP). BatAMP provides a central platform where biologists can upload their detection data in order to better understand the distribution, seasonal movement patterns, and population status of bats across North America. These data are then compiled for visualization within this tool.

    8.4.3.   [BatAMP](#)

        8.4.3.1.   The Bat Acoustic Monitoring Portal (BatAMP) provides a centralized, web-based system that allows users to upload, visualize, share, and aggregate data derived from acoustic monitoring projects. BatAMP builds upon the core capabilities of the Data Basin platform, which allows you to:

            8.4.3.1.1.   upload spatial datasets across a variety of formats, including spreadsheets with spatial coordinates

            8.4.3.1.2.   participate in the BatAMP group and other groups, as well as create your own group workspace

            8.4.3.1.3.   use feature-rich mapping and data visualization tools

8.4.3.1.4.   aggregate datasets from multiple contributors to create a growing database of bat monitoring data

8.5.   Energy Star

8.5.1.   [Energy Star Portfolio Manager](#)

8.5.1.1.   Portfolio Manager is an interactive resource management tool that enables you to benchmark the energy use of any type of building, all in a secure online environment. Nearly 25% of U.S. commercial building space is already actively benchmarking in Portfolio Manager, making it the industry-leading benchmarking tool. It also serves as the national benchmarking tool in Canada.

8.6.   [Portal and Repository for Information on Marine Renewable Energy (PRIMRE)](#)

8.6.1.   PRIMRE provides broad access to information on marine renewable energy (MRE) projects and technologies, engineering, resource characterization, device performance, and environmental effects.

8.6.2.   [MRE Software](#)

8.6.2.1.   The MRE Software knowledge hub is a collection of relevant software for Marine Renewable Energy (MRE). The code catalog is a searchable online software discovery platform with a faceted search to identify commercial and open-source software tools, whereas the code hub is a collection of open-source MRE software with search facets relevant to open-source software.

8.6.2.2.   [Code Catalog Marine Energy Software](#)

8.6.2.3.   [MRE CodeHub](#)

8.6.2.3.1.   A collection of open-source software for the MRE community

8.6.3.   [National Lab Testing Capabilities](#)

8.6.3.1.   The National Labs have a variety of testing capabilities that the Marine Energy (ME) industry can utilize for the validation of marine energy converters (MEC) at all scales and at the component level which includes the data collection and processing. This Wiki provides a detailed overview of the testing capabilities developed by and located within the national laboratories.

8.6.3.2.   [Modular Ocean Data Acquisition System (MODAQ)](#)

8.6.3.2.1.   MODAQ provides a robust, verifiable, data acquisition solution for ME applications. Designed for offshore ME device deployments, MODAQ provides a rugged, streamlined, and reliable data pipeline for high-quality ME device testing. MODAQ is comprised of three components; MODAQ-Field, MODAQ-Cloud, and MODAQ-Web, to handle data collection, processing, and monitoring. MODAQ is developed by the National Renewable Energy Laboratory and is funded by the U.S. Department of Energy's Water Power Technologies Office. For more information about MODAQ and NREL's open water validation capabilities see: https://www.nrel.gov/water/open-water-testing.html

8.6.3.3.   The Marine and Hydrokinetic ToolKit (MHKiT)

    8.6.3.3.1.   MHKiT is an open-source ME software developed in Python and MATLAB that includes modules for ingesting, performing quality control, processing, visualizing, and managing data. MHKiT-Python and MHKiT-MATLAB provide robust and verified functions in both Python and MATLAB that are needed by the MRE community to standardize data processing. Calculations and visualizations adhere to International Electrotechnical Commission (IEC) technical specifications and other guidelines.

    8.6.3.3.2.   MHKiT is developed as a collaboration between the National Renewable Energy Laboratory (NREL), Pacific Northwest National Laboratory (PNNL), and Sandia National Laboratories (SNL). Development of MHKiT is funded by the U.S. Department of Energy's Water Power Technologies Office. MHKiT is currently hosted on GitHub where users can download the code, ask questions, provide suggestions, and contribute new capabilities.