

Data Documentation for Mapping and Screening Criteria for Renewable Energy Generation Potential on EPA- and State- Tracked Sites

RE-Powering America's Land Initiative

Revised September 2018

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Overview

The U.S. Environmental Protection Agency (EPA) Office of Land and Emergency Management (OLEM), Office of Partnerships, Communication and Analysis (OCPA) created the RE-Powering America's Land Initiative to demonstrate the enormous potential that contaminated lands, landfills, and mine sites provide for developing renewable energy in the United States. To that end, the Initiative developed the RE-Powering Mapper tool. The tool is a publicly available spatial database of more than 130,000 sites that have been evaluated for renewable energy potential. This document details the screening process and data underlying the Mapper.

EPA developed national-level site screening criteria in partnership with the U.S. Department of Energy (DOE) National Renewable Energy Laboratory (NREL). The most recent screening occurred in August 2018. Described in this document, the screening criteria demonstrate the potential to reuse contaminated land for solar, wind, biomass, and geothermal energy production based on resource availability, acreage, and distance to transmission lines and roads. Although these sites have been preliminarily screened for renewable energy potential based on a number of technical considerations, many other factors should be considered in order to determine a project's ultimate feasibility. Renewable energy developers and/or relevant stakeholders usually conduct rigorous site-specific analyses to verify both technical and economic feasibility.

For the purposes of this screening, site status in terms of clean-up or potential contamination status has not been considered. Sites may or may not have been assessed and/or remediated. The Mapper database includes a link from each site to a source with more information about the site's environmental conditions.

The federal- and state-tracked sites included in this screening represent a subset of nationwide contaminated lands, landfills, and mine sites. The inventory includes sites that are tracked at the national level through EPA remediation and grant programs, as well as datasets provided from 16 state partners. Many additional sites are tracked at the state and local level, but have not been screened as part of this effort. State brownfield and response programs can be found in the 2017 [State Brownfields and Voluntary Response Programs](#) report.

Data, Criteria and Methodology

EPA developed an inventory of contaminated lands, landfills, and mine sites from various sources, as listed here. This subset of EPA- and state-tracked sites was then screened for renewable energy resource potential, as described in the [Screening Criteria](#) on (p. 9).

Site Information Datasets

While EPA and state databases are refreshed regularly with new sites and updated acreage, the data in the Mapper represent snapshots in time. The tables in this section provide sources and timing of data extraction. The use of site-specific information provided herein should only be used with the understanding that the information may change over time.

EPA does not maintain or manage state datasets. Snapshots of the following states' data are included in this update of the Mapper: California, Colorado, Connecticut, Florida, Hawai'i, Illinois, Maryland, Massachusetts, Minnesota, Missouri, New Jersey, New York, Oregon, Pennsylvania, Texas, Virginia, and West Virginia.

EPA Datasets

Program Name	Description of Dataset used in Analyses	Data Downloaded	Date of Screening
Abandoned Mine Lands (AML) Program	AML sites include all abandoned hardrock mines and mineral processing sites listed in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS). Includes abandoned mine sites on the National Priorities List (NPL), often referred to as "Superfund" Sites, and abandoned mine sites where EPA has also made emergency response actions. Visit EPA's AML website at https://www.epa.gov/superfund/abandoned-mine-lands-for-more-information-on-aml .	4/2018	8/2018
Brownfields	Brownfields are real property where expansion, redevelopment, or reuse may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Brownfields are often found in and around economically depressed neighborhoods. Includes data in the Assessment Cleanup and Redevelopment Exchange System (ACRES) database. Data include information on properties associated with EPA Brownfields grants awarded in fiscal year 2003 and beyond, where an assessment or cleanup activity has been completed and EPA Brownfields funding was expended. Visit EPA's Brownfields website at https://www.epa.gov/brownfields-for-more-information-about-brownfields .	2/2018	8/2018
Resource Conservation and Recovery Act (RCRA) – Corrective Action	RCRA sites are commercial, industrial, and federal facilities that treat, store, or dispose of hazardous wastes that require cleanup of the contamination under the RCRA Corrective Action Program. Includes all sites from the RCRA 2020 Universe Inventory. Visit EPA's RCRA website at https://www.epa.gov/rcra-for-more-information-about-rcra .	2/2018	8/2018
Superfund	Superfund sites are contaminated industrial facilities, waste management sites, mining and sediment sites, and federal facilities. Site data for these sites were extracted from the Superfund Enterprise Management System. This dataset includes sites listed on, proposed to, and deleted from the NPL, as well as some sites that are not included on the NPL (e.g., removal sites), in addition to Superfund Alternative Approach sites. Visit EPA's Superfund website at https://www.epa.gov/superfund-for-more-information-about-superfund .	4/2018	8/2018
Landfill Methane Outreach Program (LMOP)	LMOP is a voluntary assistance and partnership program that promotes the use of landfill gas as a renewable, green energy resource. LMOP screens landfills to determine their landfill gas potential. In addition, LMOP tracks landfills that have operational, under construction, or shutdown landfill gas energy projects. This universe of sites includes all landfills that have partnered with LMOP. Visit EPA's LMOP website at www.epa.gov/lmop/ for more information and definitions of landfill gas energy projects.	2/2018	8/2018

State Agencies

The following tables contain are contact information for state agencies that provided information and data for the state-tracked sites included in the RE-Powering Mapper.

State	Contact Information
California	California Department of Toxic Substances Control EnviroStor 1001 I Street P.O. Box 806 Sacramento, CA 95812-0806 877-786-9427 Email: envirostor@dtsc.ca.gov http://www.envirostor.dtsc.ca.gov/public/
Colorado	Colorado Department of Public Health and Environment 4300 Cherry Creek Drive South Denver, CO 80246 303-692-2000 Email: cdphe.information@state.co.us https://www.colorado.gov/pacific/cdphe/voluntary-cleanup
Connecticut	Connecticut Department of Energy and Environmental Protection 79 Elm Street Hartford, CT 06106-5127 860-424-3768 Email: mark.lewis@ct.gov Brownfields - http://www.ct.gov/deep/cwp/view.asp?a=2715&q=324950&deepNav_GID=1626 Landfills - https://www.ct.gov/deep/lib/deep/site_cleanup/brownfields/closed_landfills_Sorted_by_Town.pdf
Florida	Florida Department of Environmental Protection Brownfield Program 2600 Blair Stone Road Tallahassee, Florida 32399-2400 Name: Laura Barrett 850-245- 8932 Email: Laura.K.Barrett@dep.state.fl.us https://floridadep.gov/waste/waste-cleanup/content/brownfields-program Florida Department of Environmental Protection 2600 Blair Stone Road Tallahassee, Florida 32399-2400 850-245-8765 Email: public.services@dep.state.fl.us https://floridadep.gov/ Name: Christopher Williams 850-245- 8758 Email: Christopher.A.Williams@dep.state.fl.us

State	Contact Information
	Florida Department of Environmental Protection Division of Waste Management, Solid Waste Program & Permitting 2600 Blair Stone Road Tallahassee, Florida 32399-2400 Name: Cory Dilmore 850-245-8712 Email: Cory.Dilmore@dep.state.fl.us https://floridadep.gov/ Florida Department of Environmental Protection Waste Cleanup Program 2600 Blair Stone Road Tallahassee, Florida 32399-2400 Name: Teresa Booesbaghi 850-245- 8930 Email: Teresa.Booesbaghi@dep.state.fl.us https://floridadep.gov/Waste/Waste-Cleanup
Hawai'i	Hawai'i State Department of Health Hazard Evaluation and Emergency Response Office 919 Ala Moana Boulevard, Room 206 Honolulu, HI 96814 Telephone: (808) 586-4249 Fax: (808) 586-7537 http://eha-web.doh.hawaii.gov/eha-cma/Org/HEER
Illinois	Remediation Projects Management Section 1021 North Grand Avenue East P.O. Box 19276 Springfield, Illinois 62794-9276 217-524-3300 Site Remediation program: http://www.epa.illinois.gov/topics/cleanup-programs/bol-database/srp/index State Response Action: http://www.epa.illinois.gov/topics/cleanup-programs/bol-database/ssu/index
New Jersey	Bureau of Energy and Sustainability New Jersey Department of Environmental Protection 401 East State Street, 2nd Floor P.O. Box 420, Mail Code: 401-02H Trenton, NJ 08625 609-633-0538 Contact form: https://www.state.nj.us/dep/ages/bes-contact.html Website: https://www.state.nj.us/dep/ages/bes.html ; https://www.state.nj.us/dep/srp/kcsnj/

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State	Contact Information
New York	New York Department of Environmental Conservation (NYS DEC) Environmental Remediation 625 Broadway Albany, NY 12233-7012 518-402-9764 Email: derweb@gw.dec.state.ny.us www.dec.ny.gov/chemical/brownfields.html
Maryland	Maryland Land Restoration Program 1800 Washington Boulevard Baltimore, MD 21230 410-537-3493 Email: mde.webmaster@maryland.gov https://mde.maryland.gov/programs/Land/MarylandBrownfieldVCP/Pages/index.aspx
Massachusetts	Clean Energy Results Program 100 Cambridge Street, Suite 1020 Boston, MA 02114 (617) 626-1000 Email: BWSC.Information@state.ma.us http://www.mass.gov/eea/agencies/massdep/climate-energy/energy/
Minnesota	Minnesota Pollution Control Agency 520 Lafayette Road N. St. Paul, MN 55155-4194 800-657-3864 Email: info.pca@state.mn.us https://www.pca.state.mn.us/waste/clean-up-contaminated-sites
Missouri	Land Reclamation Program Industrial and Metallic Minerals Mining Unit P.O. Box 176 Jefferson City, MO 65102-0176 573-751-4041 Email: https://dnr.mo.gov/contact/land.htm https://dnr.mo.gov/geology/lrp/
Oregon	Oregon Department of Environmental Quality Environmental Cleanup Program 700 NE Multnomah St., Suite 600 Portland, OR 97232 503-229-6258 Email: DEQInfo@deq.state.or.us https://www.oregon.gov/deq/Hazards-and-Cleanup/env-cleanup/Pages/ecsi.aspx
Pennsylvania	Bureau of Abandoned Mine Reclamation Rachel Carson State Office Building P.O. Box 69205 Harrisburg, PA 17106-9205 717-783-2267 Email: RA-epcontactus@pa.gov https://www.dep.pa.gov/Business/Land/Mining/AbandonedMineReclamation/Pages/default.aspx

State	Contact Information
Texas	Municipal Solid Waste Permits Section, Waste Permits Division, Texas Commission on Environmental Quality Texas Commission on Environmental Quality, MC-124 P.O. Box 13087 MC124 Austin, Texas 78711-3087 512-239-22335 Email: Charles.Brown@tceq.texas.gov or Armando.Barrera@tceq.texas.gov Superfund Section, Remediation Division, Texas Commission on Environmental Quality Texas Commission on Environmental Quality, MC-136 P.O. Box 13087 MC136 Austin, Texas 78711-3087 (512) 239-2479 Fax: (512) 239-2450 Email: carol.rahmani@tceq.texas.gov
Virginia	Coal AML Virginia Division of Mined Land Reclamation (VA DMLR) 3405 Mountain Empire Road P.O. Drawer 900 Big Stone Gap, VA 24219 276-523-8100 Email: dmlrinfo@dmme.virginia.gov https://www.dmme.virginia.gov/DMLR/DmlrLandingPage.shtml Orphaned Land Program Division of Mineral Mining Virginia Department of Mines, Minerals and Energy 900 Natural Resources Drive, Suite 400 Charlottesville, VA 22903-0667 434-951-6310 Email: dmmlinfo@dmme.virginia.gov https://www.dmme.virginia.gov/DMM/divisionmineralminning.shtml
West Virginia	Office of Abandoned Mine Lands and Reclamation 601 57th Street, SE Charleston, WV 25304 304-926-0499 Contact form: http://www.dep.wv.gov/Pages/contact.aspx www.dep.wv.gov/aml/Pages/default.aspx

State Tracked Abandoned Mine Lands Datasets

Two types of AMLs were included in this analysis. The first are coal mining sites that were operated prior to August 3, 1977. The federal Surface Mining Control and Reclamation Act (SMCRA) of 1977 created a fund to eliminate (reclaim) health and safety hazards associated with coal mining operations that were abandoned before the statute was enacted. As a result of SMCRA, Pennsylvania, Virginia, and West Virginia developed these datasets as inventories of AML sites eligible for reclamation. The second type of AML included in the Mapper includes hard rock and other mineral mine sites.

State	Description of Dataset used in Analyses	Data Downloaded	Date of Screening
West Virginia AML	Obtained from the West Virginia Office of Abandoned Mine Lands and Reclamation. It represents AML problem areas comprising various types (portals, highwalls, piles or embankments, etc.). These are identified by PAD Name and Number (WV-****). Each PAD can contain one feature, or multiple features of one or more problem type.	5/2018	8/2018
Pennsylvania Abandoned Coal Mine Lands	Portrays the approximate location of Abandoned Mine Land Problem Areas containing public health, safety, and environmental problems created by past coal mining that occurred prior to the passage of the federal Surface Mining Control and Reclamation Act of 1977 (SMCRA). The data represent the AML Inventory Sites, which are the boundary of an entire problem area and may contain multiple actual mining features. The dataset does not include ownership or parcel information. Most sites are owned privately. When needed, ownership information must be researched through other means, typically county real estate records.	4/2018	8/2018
Virginia AML	A polygon shapefile obtained from the Virginia Department of Mines, Minerals and Energy's Division of Mined Land Reclamation. The dataset represents polygons of mines extracted from U.S. Geological Survey (USGS) topographic maps, last photo revised in the late 1970s and early 1980s. Some of these areas may represent sites that have been re-mined.	5/2018	8/2018
Virginia Orphan Land Program	Obtained from the Virginia Department of Mines, Minerals and Energy's Division of Mineral Mining. This dataset represents orphaned mineral mining sites in Virginia operated prior to 1968, when the Virginia Reclamation Law was enacted. Once identified, an orphaned mine site is evaluated for its potential hazards to the environment and the public's health and safety. This may include soil and water investigations, studies on the feasibility of reclaiming the site, cost analysis, and seeking landowner consent to allow reclamation to proceed.	5/2018	8/2018
New Jersey AML	A polygon shapefile and contains AMLs in New Jersey.	11/2011	8/2018
New Jersey Sand and Gravel Operations	A polygon shapefile and contains registered and non-registered sand and gravel operations in New Jersey. Only non-registered sand and gravel operations were evaluated in this study.	11/2011	8/2018
Missouri AML	Depicts boundaries of AML projects in Missouri. This data set contains polygons that represent the construction boundary for past AML reclamation projects. This is not an exhaustive list.	5/2018	8/2018
Missouri Industrial Minerals	Contains industrial (limestone, barite, sand, gravel, clay, and others) mineral sites that have or have had permits.	5/2018	8/2018
Missouri Metallic Minerals	Contains metallic (lead, zinc, iron, gold and others) mineral sites that have or have had permits.	5/2018	8/2018

State Tracked Contaminated Site Datasets

Most states track and remediate contaminated sites; the level of detail and types of information tracked and reported varies from state to state. The data gathered as part of this study were effectively “standardized” to capture the most important information consistently reported across a wide range of states. Locations were verified to map in the associated states. These data represent a snapshot in time.

Name	Description of Dataset used in Analyses	Data Downloaded	Date of Screening
California Department of Toxic Substances Control (DTSC)	DTSC populates the EnviroStor database system with information about sites that are known to be contaminated with hazardous substances as well as information on uncharacterized properties where further studies may reveal problems. The dataset was downloaded from http://www.envirostor.dtsc.ca.gov/public/data_download.asp .	5/2018	8/2018
Colorado Brownfield	Includes sites in the Colorado Brownfields Program, which provides public and private property owners with resources to facilitate cleanups at abandoned industrial facilities, long-forgotten gas stations, and other potentially contaminated properties that would otherwise languish and hinder economic development.	5/2018	8/2018
Colorado Institutional Control	Includes sites classified under State of Colorado SB 145 and SB 037 (collectively referred to hereafter as “SB 145”) create three different mechanisms for implementing Institutional Controls (ICs) imposed as part of remediation decisions. But the statute does more than simply create these legal mechanisms. It also requires ICs be implemented in specific situations, and establishes procedures for ensuring that the people who need to know about the restrictions do, in fact, know of them. The statute specifies certain terms that must be included in all covenants and restrictive notices. It also creates procedures for modifying and terminating covenants and restrictive notices.	5/2018	8/2018
Colorado Municipal Landfills	Includes municipal landfills open for public access within the State of Colorado.	5/2018	8/2018
Colorado Uranium Mill Tailings Radiation Control Act	Contains sites classified under the Uranium Mill Tailings Radiation Control Act of 1978. The Act gave DOE the responsibility of stabilizing, disposing, and controlling uranium mill tailings and other contaminated material at twenty-four uranium mill processing sites located across ten states and at approximately 5,200 associated properties. In the 1950s and 1960s, private firms processed most uranium ore mined in the United States. After uranium mining came under federal control, companies abandoned their mill operations, leaving behind materials with potential long-term health hazards. These mills contained low-level radioactive wastes and other hazardous substances that eventually migrated to surrounding soil, groundwater, surface water, and emitted radon gas	5/2018	8/2018
Colorado Voluntary Cleanup and Redevelopment Program	Contains sites listed under Colorado's Voluntary Cleanup and Redevelopment Program, which was created in 1994 to facilitate the redevelopment and transfer of contaminated properties.	5/2018	8/2018
Connecticut Department of Energy & Environmental Protection	Includes sites in Connecticut that have received a brownfields grant or loan from EPA or the state, or that have enrolled in one of the state's liability relief programs.	5/2018	8/2018
Connecticut Closed Landfills	Includes closed landfills in Connecticut.	5/2018	8/2018
Florida Solid Waste Management	Contains facility-specific information on Solid Waste Management facilities statewide.	2/2018	8/2018
Florida Brownfield	Includes sites classified as brownfields by the Florida Department of Environmental Protection (FDEP), i.e., abandoned, idled, or underused industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination.	2/2018	8/2018

Name	Description of Dataset used in Analyses	Data Downloaded	Date of Screening
Florida Department of Environmental Protection Waste Cleanup	Contains information associated with waste cleanup sites at all stages of cleanup until final site rehabilitation completion is approved or until referred to and accepted by other program areas such as the EPA, State Cleanup/Superfund, petroleum, or drycleaning solvent cleanup programs.	2/2018	8/2018
Florida Institutional Control Registry	Contains institutional control sites or sites that have certain restrictions on the property. For example, a site may be cleaned up to satisfy commercial contamination target levels. An institutional control may be placed on that property indicating that it may only be used for commercial levels. If the owner of the property ever wants to use that property for residential purposes, the owner will have to ensure that the contamination meets residential target levels.	2/2018	8/2018
Hawai'i State Department of Health	Inventory of brownfield sites from the Hawai'i State Department of Health - Hazard Evaluation and Emergency Response (HEER) Office, located at http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/public-records . Note that summary information is available via an HEER Sites of Interest Lookup Spreadsheet. Additional site-specific information is available by making a request to access the HEER Office public record. Instructions for making the request and the PDF "Request to Access a Public Record Form" are both available at the link herein.	5/2018	8/2018
Illinois Site Remediation Program	Sites are part of the Illinois Site Remediation Program, which identifies voluntary remediation projects administered through the Pre-Notice Site Cleanup Program (1989 to 1995) and the Site Remediation Program (1996 to the present).	2/2018	8/2018
New Jersey Known Contaminated Sites	Known Contaminated Sites List (KCSNJ) for New Jersey (Non-Homeowner), which contains those non-homeowner sites and properties within the state where contamination of soil or groundwater has been confirmed at levels equal to or greater than applicable standards. This list of Known Contaminated Sites may include sites where remediation is either currently under way, required but not yet initiated, or has been completed. See https://www.state.nj.us/dep/srp/kcsnj/ for more details.	11/2011	8/2018
New Jersey Landfills	A polygon shapefile of landfill parcel or parcels greater than 35 acres located in New Jersey.	11/2011	8/2018
New York Environmental Remediation Sites	A polygon shapefile containing records of the sites that have been remediated or are being managed under one of Division of Environmental Remediation's (DER) remedial programs (i.e., State Superfund, Brownfield Cleanup, etc.). All sites listed on the "Registry of Inactive Hazardous Waste Disposal Sites in New York State" are included in this database. The Database also includes sites with entries on the "Registry of Institutional and Engineering Controls in New York State."	4/2018	8/2018
Maryland Land Restoration Program	Consists of digital data describing sites under the oversight of Maryland's Land Restoration Program (LRP). Within the LRP, three programs exist to investigate eligible properties with known or perceived controlled hazardous substance contamination, protect public health and the environment, accelerate cleanup of properties, and provide liability releases and finality to site cleanup: the Voluntary Cleanup Program (VCP), the Brownfields Initiative, and State Remediation Sites.	4/2018	8/2018
Massachusetts Land Disposal of Solid Waste	The Solid Waste Land Disposal data layer, which was compiled by the Department of Environmental Protection (MassDEP) to track the locations of land disposal of solid waste. Land disposal refers to an operation established in accordance with a valid site assignment for the disposal of solid waste into or on land (Landfill), or a location for disposal of solid waste from one or more sources that is not established or maintained pursuant to a valid site assignment or permit (Dumping Ground).	5/2018	8/2018

Name	Description of Dataset used in Analyses	Data Downloaded	Date of Screening
Massachusetts Contaminated Land Profiles	Contains sites in the Massachusetts Contaminated Land Profile List, which was compiled by MassDEP to identify sites that have had a release of oil or hazardous materials and are regulated under MGL c. 21E and 310 CMR 40.0000. This list includes a small subset of sites having characteristics favorable for renewable energy redevelopment, including: historical and/or current industrial/commercial use; proximity to existing infrastructure (transmission lines, substations, roads, water, and rail); potential local zoning/permitting designations compatible with reuse; and revitalization of distressed property versus degradation of open space. NOTE: Although many sites on this list may be considered brownfields under the Solar Massachusetts Renewable Target regulations at 225 CMR 20.00 (DOER Regulations) issued by the Massachusetts Department of Energy Resources (DOER), a site's inclusion on this list DOES NOT AUTOMATICALLY QUALIFY IT as a brownfield under such regulations. Similarly, other sites not included on this list may qualify as a brownfield under the DOER Regulations. See the DOER Regulations and applicable DOER guidance for more information on which sites will be eligible for consideration as a brownfield: https://www.mass.gov/lists/developing-solar-photovoltaics-on-contaminated-land	4/2014	8/2018
Minnesota Pollution Control Agency Contaminated	A list of properties within the state that are contaminated.	5/2018	8/2018
Oregon Environmental Cleanup Sites	Oregon Department of Environmental Quality (DEQ) Environmental Cleanup Site Information (ECSI) database. DEQ maintains the database to track cleanup sites in the state with known or potential contamination from hazardous substances, and to document sites where DEQ has determined that no further action is required. Data in ECSI is "working information" used by DEQ's Environmental Cleanup Section.	1/2018	8/2018
Texas Municipal Solid Waste Facilities	A spreadsheet listing issued permits and other authorizations as well as pending applications for MSW landfills and processing facilities that are active, inactive, or not yet constructed. Also lists issued and revoked permits and other authorizations for MSW landfills and processing facilities that have closed, and applications that were withdrawn or denied.	2/2018	8/2018
Texas Superfund Sites	Sites in the state of Texas that have been designated as Superfund cleanup sites; includes both federal- and state-designated sites. Federal sites were excluded for the purpose of this analysis so as not to double count those already included in the EPA Superfund dataset.	1/2018	8/2018
Texas Voluntary Cleanup Sites (VCP)	Contains sites under the Texas VCP, which provides administrative, technical, and legal incentives to encourage the cleanup of contaminated sites in Texas. All non-responsible parties, including future lenders and landowners, receive protection from liability to the state of Texas for cleanup of sites under the VCP, and most constraints for completing real estate transactions at those sites are eliminated. As a result, many unused or underused properties may be restored to economically productive or community beneficial use.	1/2018	8/2018

Screening Criteria

EPA and NREL developed the following screening criteria used to evaluate renewable energy potential. Other critical factors for siting renewable energy facilities (e.g., slope), should be considered on a site-by-site basis.

Renewable Energy Type and Scale	Estimated RE Project Capacity Range*	Renewable Energy Resource Availability	Acreage (acres)	Distance to Transmission (miles)	Distance to Graded Roads (miles)
Solar PV		Direct Normal (kWh/m²/day)			
Large utility scale	≥ 100 MW	≥ 3.0	≥ 550	≤ 20	≤ 10
Utility scale	5–100 MW	≥ 3.0	275 < 550	≤ 10	≤ 10
Small utility scale	2–50 MW	≥ 3.0	11 < 275	≤ 5	≤ 10
Large distributed scale	10 kW–2 MW	≥ 3.0	≥ 0.06	--	≤ 1
Off-grid	N/A	≥ 2.5	--	--	--
Acreage Unknown	--	≥ 3.0	--	--	--
Wind		Wind speed (m/s)**			
Large utility scale	≥ 100 MW	5.5 m/s at 80 m	≥ 1200	≤ 20	≤ 10
Utility scale	50–100 MW	5.5 m/s at 80 m	600 < 1200	≤ 10	≤ 10
Small utility scale	15–50 MW	5.5 m/s at 80 m	100 < 600	≤ 5	≤ 10
Large distributed scale	5–15 MW	5.5 m/s at 80 m	≥ 10	--	≤ 10
1–2 turbine sites	< 5 MW	5.5 m/s at 80 m	≥ 3	--	≤ 1
Off-grid	N/A	5.5 m/s at 60 m	≥ 0.25	--	--
Acreage Unknown	--	5.5 m/s at 80 m	--	--	--
Biomass		Biomass potential within 50 miles (metric tons/year)			
Biopower	> 10 MW	≥ 150,000 (woody)	≥ 6	≤ 10	≤ 3 road; ≤ 8 rail
Biorefinery	> 20 MMgal/year	≥ 286,000 (herbaceous)	≥ 132	N/A	≤ 3 road; ≤ 8 rail
Geothermal		Near Surface Temperature			
Heat Pump	N/A	10° C (50° F) to 24° C (75° F)	Acreage and distance variables are not included in the prescreening.		

*MW is megawatts, MMgal/year is million gallons per year.

** Wind speed is represented in meters per second (m/s) at heights of 60 and 80 m, as specified for each resource type.

The screening categories for wind and solar (other than off-grid) are based on a review of successful projects and conversations with the solar installer community. These guidelines can be used generally to screen sites, but more in-depth analysis should be used prior to making investment decisions. The main consideration for distinguishing between project potential is the relationship between size (based on acreage value) and relative distance to transmission lines. Transmission lines are typically defined as power lines with voltages greater than or equal to 69kV. Large capacity (≥15 MW) projects require these high-voltage transmission lines to move large amounts of power. The larger a project, the greater the ability to absorb the cost of a long-distance connection to existing transmission and higher cost substations. Distributed generation projects (0–15 MW for wind and 0–2 MW for solar) are typically connected to power lines with distribution voltages less than 69 kilovolts (kV); as such, for the purposes of this screening the criteria do not factor a distance to transmission for these projects. For example, smaller projects may be quite far from transmission lines, assuming there is distribution voltage infrastructure available. However, the distance to the nearest substation can be critical depending on project size. Existing generation on the feeder, which connects the consumer/load end with the substation, is also an important consideration. Coordination with the local utility is highly recommended when assessing the potential of a distributed generation project.^{1,2}

Acreage is not a screening criterion for off-grid solar because such systems are typically used to power a single property or local area, and are not constrained by limited acreage. For example, a property owner could install PV panels to supplement the electricity provided to the site from traditional sources. In most cases, these systems would need to be

¹ Source: Bank, J. et al. High Penetration Photovoltaic Case Study Report. No. NREL/TP-5500-54742. National Renewable Energy Lab. (NREL), Golden, CO (United States), 2013. <https://www.nrel.gov/docs/fy13osti/54742.pdf>

² Source for PV Cost: 2017 Cost Benchmark - <https://www.nrel.gov/docs/fy17osti/68925.pdf>

interconnected to the existing utility grid and may be subject to utility regulations or policies. In some cases, an off-grid system may power a given load (e.g., a small-scale pump and treat system).

Approximately 30,000 sites in EPA's inventory do not include acreage values. These Acreage Unknown sites cannot be screened, but EPA does include sites that may potentially meet the resource criteria for wind and solar. Further investigation of these sites is required.

The total acreage required for a given wind project varies widely depending on total project capacity (MW), turbine type, resource strength, geographic region, power market, and the cost of leasing land. Single-turbine projects that are cited only by fall distance/tip height can achieve capacity densities of only 1.1 acres/MW assuming the highest capacity turbines offered in the United States (Vestas 4.2-MW turbines) and a tip height of 500 feet, which is a typical constraint. Very large wind farms can have a capacity density of 250 acres/MW. These data illustrate the wide range of capacity densities that are found among wind installations in the United States.³

The main biomass feedstocks for power are paper mill residue, lumber mill scrap, and municipal waste. For biomass fuels, the most common feedstocks are corn grain (for ethanol) and soybeans (for biodiesel).⁴ See additional sources on biopower screening criteria.^{5,6,7,8}

Acreage is not a screening criterion for geothermal heat pumps because they have a small, primarily subterranean footprint. Typically any site with existing or planned buildings or that has other heating or cooling needs (i.e., office buildings, warehouses, greenhouses) could be considered for geothermal heat pumps. For general information about geothermal heat pumps see additional sources.^{9,10}

State Policies

The economic viability of renewable energy projects is tied closely to the policy and regulatory context of the jurisdiction in which the installation would be sited. In addition to the renewable energy technology screen, the Mapper includes a layer with relevant policy and incentives that support renewable energy at the state level. A renewable portfolio standard¹¹ (RPS) is one of the policies that is included. An RPS is a regulatory mandate to increase production of energy from renewable sources such as wind, solar, biomass and other alternatives to fossil and nuclear electric generation. Another important policy is community choice aggregation¹² (CCA), which allow local governments to procure power from an alternative supplier on behalf of residents, businesses, and municipal accounts while still receiving transmission and distribution service from the existing utility provider. CCAs provide local control over electricity. See the [RE-Powering Mapper Full User Guide](#) for specific policies and information included.

The following information is included in the Mapper as a State Policies layer:

Policy	Definition	Source	Date Accessed
RPS Policy	States with an RPS or goal	Galen Barbose, Lawrence Berkeley National Laboratory; goals from DSIRE website http://ncsolarcenter-prod.s3.amazonaws.com/wp-content/uploads/2017/03/Renewable-Portfolio-Standards.pdf	8/2018
Deregulated Electricity Market	State electricity market is deregulated	Electric Choice website, https://www.electricchoice.com/map-deregulated-energy-markets/	8/2018

³ Source: Denholm, Paul, et al. Land use requirements of modern wind power plants in the United States. No. NREL/TP-6A2-45834. National Renewable Energy Lab.(NREL), Golden, CO (United States), 2009. <https://www.nrel.gov/docs/fy09osti/45834.pdf>

⁴ Source: NREL <https://www.nrel.gov/workingwithus/re-biomass.html>

⁵ <http://www.desmoinesregister.com/story/money/business/2016/04/04/poets-emma-burg-plant-could-full-output-2016/82434182/>

⁶ <http://www.desmoinesregister.com/story/money/agriculture/2015/10/30/worlds-largest-cellulosic-ethanol-plant-opens-iowa/74878736/>

⁷ Humbird, D.; Davis, R.; Tao, L.; Kinchin, C.; Hsu, D.; Aden, A.; Schoen, P.; Lukas, J.; Olthof, B.; Worley, M.; Sexton, D.; Dudgeon, D. (2011). Process Design and Economics for Biochemical Conversion of Lignocellulosic Biomass to Ethanol: Dilute-Acid Pretreatment and Enzymatic Hydrolysis of Corn Stover. 147 pp.; NREL Report No. TP-5100-47764. <http://www.nrel.gov/docs/fy11osti/47764.pdf>

⁸ Biofuels criteria furnished by Gregg Tomberlin, Senior Engineer, National Renewable Energy Laboratory

⁹ <https://www.energy.gov/energysaver/heat-and-cool/heat-pump-systems/geothermal-heat-pumps>

¹⁰ DOE (2009). Ground-Source Heat Pumps: Overview of Market Status, Barriers to Adoption, and Options for Overcoming Barriers. Navigant Consulting, Inc. https://www1.eere.energy.gov/geothermal/pdfs/gshp_overview.pdf

¹¹ Source: <https://www.nrel.gov/technical-assistance/basics-portfolio-standards.html>

¹² Source: <https://www.epa.gov/greenpower/community-choice-aggregation>

Policy	Definition	Source	Date Accessed
RE-Powering Policy	States that encourage, through regulations and policies, RE on brownfields, landfills and/or mine sites	Various	8/2018
Physical Net Metering	State has physical net metering	DSIRE website, http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2017/11/DSIRE_Net_Metering_November2017.pdf	8/2018
Virtual Net Metering	State has virtual net metering	Institute for Local Self-Reliance website, https://ilsr.org/virtual-net-metering/	8/2018
Renewable Energy Tax Incentive	State has renewable energy tax incentive above and beyond federal tax incentives	DSIRE website, http://programs.dsireusa.org/system/program (Search "Tax")	8/2018
Shared Renewable Energy	State has policies to specifically encourage community solar or some other form of shared renewables	Shared Renewables website, http://www.sharedrenewables.org/community-energy-projects/	8/2018
Community Choice Aggregation	State has legislation that specifically allows CCA	EPA Community Choice Aggregation website, https://www.epa.gov/greenpower/community-choice-aggregation	8/2018
Electricity Retail Choice	State has adopted electric retail choice programs that allow end-use customers to buy electricity from competitive retail suppliers	NREL website, https://www.nrel.gov/docs/fy18osti/68993.pdf	8/2018
Green Tariff	State has a green tariff	U.S. Renewable Energy Map: A Guide for Corporate Buyers website, https://www.wri.org/resources/maps/us-re-corporate-buyers-map	8/2018
No. Known RE-Powering Sites	The total number of known completed renewable energy sites	EPA RE-Powering website, https://www.epa.gov/re-powering/re-powering-tracking-matrix	8/2018

- **Regulated/deregulated electricity market:** in deregulated energy markets, energy consumers can choose their suppliers for services such as electricity or natural gas. This includes the opportunity to select suppliers who generate and/or purchase some or all of their generation from renewable energy sources.
- **Net metering:** billing mechanism that credits an energy system owner for electricity they add to the grid. The metering can be physical (for single, on-site meters) or virtual (for energy that is externally installed and shared among multiple users).
- **Community solar:** a solar-electric system that, through a voluntary program, provides power and/or financial benefit to, or is owned by, multiple community members¹³.

Screening Methodology and Constraints

EPA screened all sites by comparing the site location with renewable energy resources. Specific renewable energy technology type, site size, and proximity to infrastructure criteria are applied to give the Mapper user a high-level indication of sites with likely renewable energy potential. These criteria are described in the table (on p.10).

As noted in the [Overview](#) section of this document, this analysis represents an initial screening, and sites should be investigated further for both technical and economic feasibility. For example, although slope is a critical factor for siting some types of renewable energy, it was not considered in the analysis due to limitations in the availability of high-resolution slope data for sites dispersed across the United States. Site-specific slope analysis should be performed for any site being considered for renewable energy development.

EPA validated sites by identifying and eliminating those with potentially incorrect spatial reference data. If mapped locations did not match county or state as recorded, they were excluded from the analysis. Approximately 2,500 sites were eliminated from the screening due to issues with the location data. EPA also considered duplication in developing the full dataset. In instances where a state-tracked site was also in an EPA database, that site was removed from the state dataset. Additionally, if a property was listed in a state-tracked database multiple times (e.g., multiple responses at a

¹³ Source: DOE 2010, p. 2. <https://www.nrel.gov/docs/fy11osti/49930.pdf>

single property), it was revised to only be included once per property. One exception is EPA Superfund and RCRA sites; if a site is designated as both, it is included twice in the data. It is likely that some unidentified duplicates still exist in the dataset.

All screening is performed on site polygons, i.e., sites with area over which a renewable resource can be assessed. Polygon site boundary files are not consistently available, so EPA collected data in both point and polygon ESRI shapefile format. Data for state-tracked sites in West Virginia, Pennsylvania, Virginia AMLs, New York, New Jersey AMLs, New Jersey Landfills, New Jersey Quarries and Texas Landfills were provided as polygons. Those polygons were used as is, and the remaining site boundaries were estimated. To approximate the site size/boundary and estimate the potential for renewable energy generation across an entire site, EPA mapped the site latitude and longitude point and drew a circular buffer corresponding to the area reported around that latitude/longitude point. The maximum renewable energy resource values were recorded for these areas. Sites are typically not circular, and latitude and longitude are not always recorded at the geographic center of the site. Despite these limitations, the method employed allows for a more accurate snapshot of the energy potential available at the site versus a single data point. For the biomass analysis, note that the resources are evaluated within a 50-mile radius of the site. Therefore, EPA drew a 50-mile buffer around the actual or modeled site boundary and recorded the sum of the biomass resource within 50 miles of the site was.

For sites that did not have acreage size reported, a minimal acreage buffer was generated using a radius of 0.01 meters (approximately 0.03 feet); the buffer was approximately 0.00000007 acres. This allowed easier geoprocessing across the datasets and gave each property would have a footprint of some size.

Except for Puerto Rico and the Virgin Islands, U.S. territories were not evaluated or included in this analysis because renewable energy resource and transmission data were not readily available for these territories. In addition, biomass and geothermal resource data were not readily available for Puerto Rico and the Virgin Islands, and geothermal data are limited for Alaska and Hawai'i. Therefore, these specific renewable energy potential types were not evaluated for those states and territories. .

Acreage values for each site might not represent available land or the total contaminated area. For example, many federal facilities on the NPL are listed "fence to fence," which encompasses the entire facility, rather than only the contaminated portions of the facility. As such, the potentially or formerly contaminated areas may represent only a portion of the total acreage of these Superfund sites. In addition, acreage values do not take into account the physical characteristics at the site (e.g., buildings, topography, tree cover) and, thus, may not represent the true usable acreage of the site.

Distances were calculated using GIS software to determine the proximity of the site boundary to specific infrastructure. In instances where distances to transmission lines, highways, or rails are zero, the transmission line, highway, or rail intersects the site buffer, meaning that the infrastructure is present within the site boundary.

Screening Datasets

EPA compiled and used the following geospatial data to perform the screening.

National Renewable Energy Laboratory (NREL) Data

Solar, wind and biomass resource data was obtained from NREL. Specific information on how NREL collected the data is available at: www.nrel.gov/gis/.

Resource Name	Description of Dataset used in Analyses	Date of Access
Lower 48 and Hawaii Direct Normal Resource 10-km Resolution 1998–2009	Direct normal solar resource data for the lower 48 states and Hawai'i. Used to determine potential for solar PV Source: NREL Solar Data, https://www.nrel.gov/gis/data-solar.html .	6/2018
NASA Low-Resolution Direct Normal Irradiance	Direct normal solar resource data for the world. Used for Alaska, Puerto Rico, and the Virgin Islands. Downloaded from the NREL Atlas . Source: NASA Surface meteorology and Solar Energy (SSE) Release 6.0 Data Set (Jan 2008) .	6/2018
Solid Biomass	Contains information about the biomass resources generated by county in the United States. Includes the following feedstock categories: crop residues, forest residues, primary mill residues, secondary mill residues, and urban wood waste. Used to determine potential for biorefinery and biopower facility siting. Data available for all jurisdictions except for Puerto Rico and Virgin Islands. Source: NREL Biomass Data, https://www.nrel.gov/gis/data-biomass.html .	4/2018
NREL WIND Toolkit	The WIND Toolkit includes meteorological conditions and turbine power for more than 3 million sites in the continental United States for the years 2007–2013. Source NREL WIND Toolkit, https://www.nrel.gov/grid/wind-toolkit.html	7/2018
U.S. Virgin Island Wind	Wind speed resource data at heights of 55 (this value was used to represent 60 meters in the dataset), 80, 100 and 120 meters; developed by AWS Truepower LLC. Used to provide wind speeds at various heights and to screen sites for wind energy potential in Virgin Island. Source: NREL Wind Prospector, https://maps.nrel.gov/wind-prospector/#?aL=HONQnI%255Bv%255D%3Dt&bL=groad&cE=0&IR=0&mC=18.345075428248094%2C-64.85538482666016&zL=12 .	7/2018

Census Data

Distances to Rails and roads were obtained from U.S. Census Bureau data. See <https://www.census.gov/geo/maps-data/data/tiger-line.html> for more information about Census data.

Resource Name	Description of Dataset used in Analyses	Date of Access
Rails	Includes main lines such as spur lines, rail yards, mass transit rail lines (such as carlines), streetcar track, monorail, or other mass transit rail and special purpose rail lines such as cog rail lines, incline rail lines, and trams. Extracted from the U.S. Census Bureau's Master Address File / Topologically Integrated Geographic Encoding and Referencing (MAF/TIGER) Database (MTDB). Source: Census TIGER Files.	7/2018
Primary and Secondary Roads - Puerto Rico	Includes primary and secondary roads extracted from the U.S. Census Bureau's MAF/TIGER MTDB. Primary roads are generally divided, limited-access highways within the Interstate Highway System or under state management, and are distinguished by the presence of interchanges. Secondary roads are main arteries, usually in the U.S. Highway, State Highway, and/or County Highway system. These roads have one or more lanes of traffic in each direction, may or may not be divided, and usually have at-grade intersections with many other roads and driveways. Source: Census TIGER Files.	7/2018
Primary and Secondary Roads - Virgin Islands	Includes primary and secondary roads extracted from the U.S. Census Bureau's MAF/TIGER MTDB. Primary roads are generally divided, limited-access highways within the Interstate Highway System or under state management, and are distinguished by the presence of interchanges. Secondary roads are main arteries, usually in the U.S. Highway, State Highway, and/or County Highway system. These roads have one or more lanes of traffic in each direction, may or may not be divided, and usually have at-grade intersections with many other roads and driveways. Source: Census TIGER Files.	7/2018

Resource Name	Description of Dataset used in Analyses	Date of Access
2010 Census Urban Area	The Census Bureau delineates urban areas that represent densely developed territory, encompassing residential, commercial, and other nonresidential urban land uses. In general, this territory consists of areas of high population density and urban land use resulting in a representation of the "urban footprint." There are two types of urban areas: urbanized areas (UAs) that contain 50,000 or more people, and urban clusters (UCs) that contain at least 2,500 people but fewer than 50,000 people (except in the U.S. Virgin Islands and Guam, which both contain urban clusters with populations greater than 50,000). Source: Census TIGER Files.	6/2018

Homeland Infrastructure Foundation-Level Data Open Data

Distances to transmission lines were obtained from HIFLD Open Data (<https://hifld-geoplatform.opendata.arcgis.com/>). HIFLD Open Data provides national foundation-level geospatial data within the open public domain.

Resource Name	Description of Dataset used in Analyses	Date of Access
Electric Power Transmission Lines	This feature class/shapefile represents electric power transmission lines. Transmission Lines are the system of structures, wires, insulators and associated hardware that carry electric energy from one point to another in an electric power system. Lines are operated at relatively high voltages varying from 69 kV up to 765 kV, and are capable of transmitting large quantities of electricity over long distances. Underground transmission lines are included where sources were available. This resource did not include Alaska, Hawai'i or the Virgin Islands. Source: Homeland Infrastructure Foundation-Level Data (HILFD) Open Data.	4/2018

Homeland Infrastructure Foundation-Level Data Secure Data

Substations are facilities and equipment that switch, transform, or regulate electric voltage. Distances to substations were obtained from HIFLD Secure Data (<https://gii.dhs.gov/HIFLD/data/secure/>). HIFLD Secure Data provides both for-official-use-only and commercially licensed geospatial foundation-level data within the secure Geospatial Information Infrastructure (GII) Platform to support homeland security and homeland defense missions.

Resource Name	Description of Dataset used in Analyses	Date of Access
Electric Substations	The Substations feature class/shapefile includes taps, a location where power on a transmission line is tapped by another transmission line. Source: HILFD Secure Data.	6/2018

Homeland Security Infrastructure Program (HSIP) Data

Distances to transmission lines were obtained using data from the HSIP database. *Source: HSIP Gold 2015.*

Resource Name	Description of Dataset used in Analyses	Date of Access
Transmission Lines	Depict market-significant existing and proposed electric power transmission lines in North America. Lines included in the database generally have a capacity of greater than 69 kV. This resource was used for Alaska, Hawai'i, and/or the Virgin Islands. Source: HSIP Gold 2015 – Ventyx.	6/2018

Southern Methodist University (SMU) Data

Surface temperature data for geothermal heat pumps were obtained from SMU.

Resource Name	Description of Dataset used in Analyses	Date of Access
Surface Temperature	Grid depth information was obtained from SMU on June 27, 2009. (Dr. David Blackwell, Maria Richards and Petru Negraru, 2006, SMU Geothermal Laboratory Temperature Maps).	6/2018

Esri Data

Distances to roads were obtained from Esri Data and Maps for ArcGIS®, issued 2017.

Resource Name	Description of Dataset used in Analyses	Date Accessed
U.S. Highways	Used to calculate the approximate distance to the nearest graded road. The U.S. Highways dataset represents the major and minor highways of the United States. These include interstates, U.S. highways, state highways, major roads, and minor roads. Source: Esri.	6/2018

Appendix: RE Technology Basics

The following renewable energy technologies were evaluated for this analysis. They represent the most common types of renewable energy facilities being used as of 2018. This is not an inclusive list of all renewable energy technologies; new technologies continue to be developed, while established technologies are refined.

Solar

Solar resource is typically characterized by the amount of solar energy striking a panel tilted at latitude over a given area and reported as a daily average. Solar radiation is measured in kilowatt-hours per square meter per day (kWh/m²/day).

Photovoltaic (PV) cells convert the sun's light energy directly into electricity. PV technology is scalable; the amount of electricity generated is directly related to the number and efficiency of installed panels. It can technically be sited anywhere, though the economics may make a project unfeasible in lower resource areas.

For more information on solar technologies, visit: www.nrel.gov/learning/re_solar.html.

Wind

Wind energy is captured by wind turbines with propeller-like blades mounted on a tower. The force of the wind causes the rotor to spin and the turning shaft spins a turbine to generate electricity. Wind technology is scalable; based on site conditions, different turbines designs can be used to meet different electricity needs.

Wind resource is typically characterized by wind speed (meters per second) at a given height. The resource data are selected based on the turbine size. For example, utility-scale turbines with hub heights ranging from 80–90 meters (m) generally reference the wind resource data at 80 m for initial screening.

For more information on wind technologies, visit: www.nrel.gov/learning/re_wind.html.

Biomass

Biomass energy, or "bioenergy," is generated from organic feedstocks. Wood is the most abundant and commonly used biomass energy resource; other sources of biomass include food crops, grassy and woody plants, residues from agriculture or forestry, and the organic component of municipal and industrial wastes. These feedstocks can be used as a solid fuel, or converted into liquid or gaseous forms, for the production of electric power, heat, chemicals, or fuels.

A biopower facility burns biomass resources to produce heat, which is used to boil water for a conventional steam-turbine generator to produce electricity. Biopower facilities use cumulative biomass resources that can include residues from forests, primary and secondary mills, and urban wood waste.

A biorefinery facility integrates biomass conversion processes and equipment to produce fuels, power, and chemicals from biomass. The technology uses cumulative crop residues that can include residues from crops or forests, primary and secondary mills, and urban wood waste.

For more information on biomass technologies, visit: http://www.nrel.gov/learning/re_biomass.html.

Energy can also be generated by capturing methane and other emissions from landfills. For more information on EPA's Landfill Methane Outreach Program (LMOP) and landfill gas energy technologies, visit <http://www.epa.gov/lmop/>.

Geothermal

Geothermal resource is typically characterized by temperature at a given depth, availability of water resources, and permeability of geologic layers.

A geothermal heat pump (GHP) system taps into heat at Earth's surface. The upper 10 feet of the Earth maintains a nearly constant temperature between 50° and 60°F (10°–16°C). GHPs take advantage of this resource to heat and cool buildings and heat water. GHPs consist of three parts: the ground loop heat exchanger, the heat pump unit, and the air delivery system (ductwork). The ground loop heat exchanger is a system of pipes buried in the shallow ground near the building, or in a vertical well if land for a horizontal loop is limited. Water source heat pumps work on the same principle as ground source systems, but use an adjacent body of water as the heat sink. A fluid (usually water or a mixture of water and antifreeze) circulates through the loop to absorb or relinquish heat within the ground. GHPs use much less energy than conventional heating systems, since they draw heat from the ground. GHPs typically serve a single property, though they may also be viable for use in multi-tenant applications, such as integrated district heating systems.

For more information on geothermal technologies, visit the DOE Energy Efficiency and Renewable Energy (EERE) Geothermal Technologies Program at: www1.eere.energy.gov/geothermal/ or www.nrel.gov/learning/re_geothermal.html. For additional information about a site's geothermal favorability or hydrothermal potential, see the NREL Geothermal Prospector: <https://maps.nrel.gov/geothermal-prospector>.