The U.S. Environmental Protection Agency (EPA) recognizes the overall environmental benefit of siting renewable energy projects on contaminated lands, landfills, and mine sites. To facilitate the implementation of these reuse projects, EPA's RE-Powering America's Land Initiative developed site screening tools in collaboration with the U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL).

#### Topics

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### Introduction to RE-Powering Site Screening

The RE-Powering Mapper (KMZ) and the RE-Powering Screening Dataset spreadsheet (XLS) serve as preliminary screening tools for renewable energy potential at contaminated lands, landfills, and mines sites nationwide. These tools provide high-level screening results for four renewable energy technologies: solar, wind, biomass, and geothermal. Sites are vetted based on four primary characteristics:

- Renewable energy resource,
- Acreage,
- Distance to transmission lines, and
- Distance to transportation infrastructure.<sup>1</sup>

This reference guide provides users with tips for using the RE-Powering Screening Dataset spreadsheet, which contains detailed site information on over 60,000 contaminated lands, landfills, and mine sites. Local communities, potential developers, regulators, and other interested stakeholders are encouraged to use these tools to assess potential for future renewable energy projects on contaminated lands, landfills, and mine sites.

Examples of how this data may be helpful for RE-Powering stakeholders include, but are not limited to:

- Community stakeholders: Create a report to show all contaminated sites and/or landfills with renewable energy potential within their city or county.
- City planners: Develop a priority list of landfills with potential for solar energy development, including those with landfill gas potential or existing infrastructure.
- Renewable energy developers: Identify sites in target markets that meet requirements specific to their product offering.
- Remediation professionals: Consider potential reuse opportunities with renewable energy when evaluating and selecting remedies.

#### RE-Powering America's Land Initiative

Through the RE-Powering America's Land Initiative, the EPA promotes the reuse of potentially contaminated lands, landfills, and mine sites for renewable energy through a combination of tailored redevelopment tools, as well as site-specific technical support.

The Initiative aims to revitalize degraded land by promoting renewable energy as a productive end use, when aligned with the community vision for the site.

#### Advantages of Reuse

Potentially contaminated lands, landfills, and mine sites offer developers a unique value proposition for renewable energy deployment by:

- Leveraging existing infrastructure
- Reducing project cycle times
   through streamlined permitting and
   zoning
- Improving project economics with reduced land costs and tax incentives
- Building a sustainable land development strategy by using contaminated lands
- Gaining community support
- Protecting open space

For more information, go to: www.epa.gov/renewableenergyland/



<sup>1</sup> For additional information on the screening process or data contained in the spreadsheet, please refer to the "<u>Data Documentation for Mapping and</u> <u>Screening Criteria for Renewable Energy Generation Potential on EPA and State Tracked Sites</u>"

# **RE-Powering America's Land:**

A Primer for Using RE-Powering Data to Screen Sites for Renewable Potential

#### Exercises

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### **RE-Powering Screening Dataset: Spreadsheet Contents & Organization**

The RE-Powering Screening Dataset spreadsheet provides a more detailed view of site characteristics and renewable energy resources on over 60,000 EPA- and state-tracked sites. Tracked sites include: sites where EPA or states are involved with cleanup or reclamation; sites that have received grants from EPA or states; or sites that participate in EPA or state programs.

This information is organized into fields among five major categories:

- Site identification: Provides site name, location, acreage, and links to remediation programs.
- *Policy*: Indicates if site is located in a state with a Renewable Energy Portfolio Standard (RPS) or within a Renewable Energy Zone (REZ).
- *Renewable Energy Potential*: Indicates positive screening results for each renewable energy technology, from small- to utility-scale development potential.
- Infrastructure: Provides data on proximity to critical infrastructure and identifies nearby urban areas.
- *Renewable Energy Resource Data*: Provides quantitative resource data for solar, wind, biomass, landfill gas, and geothermal technologies.



The RE-Powering Screening Dataset spreadsheet consists of three worksheets, which appear as three different tabs in the lower left hand corner of your screen.

	A	В	C
	RE-Powering The RE-Power screening resu Renewable En spreadsheet (h features to targ	Screening Dataset ing Screening Dataset ts for renewable energy potential. Please review "Data Documentatic ergy Generation Potential on EPA and State Tracked Stee" for more try/www.epa.gov/renewableenergy/and/maps/repowering_ge_data et sites with specific characteristics and develop custom reports with th	on over 60,000 contaminated lands, landtilis, and mine sites with on for Mapping and Screening Criteria for detailed information regarding the information contained in this documentation.docx). Learn how to use filtering and reporting is "Primer for Using RE-Powering Data to Screen Sites for
	Renewable En	ergy Potential.	
>	Column Reference	Attribute	Definition
1	A	EPA Region	EPA region where the site is located
	В	ST	State where the site is located (Some of the sites in the Virginia Co
	С	Program	Program from which data were obtained
;	D	Site ID	EPA or state unique identification code
	E	Site Name	Site name or name of property
	F	Address	Site Address
	G	City	City where the site is located
0	н	County	County latitude and longitude point plots in
1	1	Zip Code	Zip code
2	J	Federal Facility	Indicates that site is identified as a Federal Facility
3	К	Federal Facility Agency	Indicates cognizant Federal Facility Agency
4	I4 4	Read Me Screening	Criteria / Data / 🞾 🥂
6	N	Landfill Owner Type	Denotes if landfill owner is a public or private organization
1	0	Latitude	Latitude in decimal degrees, MAD 83 projection
3	P	Longitude	Longitude in decimal degrees, NAD 82 projection
9	Q	Acres	Acreage used for analysis
0	R	State Renewable Portfolio Standard (RPS)	Indicates which states have an RPS, RPS goal, solar set-aside, selar multiplier, or distributed generation provision.
		Renewable Energy Zones (REZ)	Renewable Energy Zones as established by the Western eovernors Association and the Department of Energy, BLM and
-			

- *Read Me:* Provides name and detailed descriptions of all data attributes.
- Screening Criteria: Provides an overview of the estimated project capacity and screening criteria used.
- *Data:* Includes all the information about 60,000-plus sites currently tracked by RE-Powering and states. The information is sorted by State (ST), City, and then Site Name.

This information can be used a variety of ways: to identify sites with renewable energy potential or, conversely, to identify renewable energy opportunities for a given site.

To facilitate use of the spreadsheet, several exercises are provided to enable users to create custom lists and summary reports by using the "Filter" and "PivotTable" functions available in MS Excel.

#### Identifying sites with Data Filters

The RE-Powering Screening Dataset spreadsheet is provided in MS Excel format. This software includes a feature that allows users to filter large datasets for particular attributes, e.g., sites located in the State of Delaware or sites within one mile of transmission lines. This feature can be used to filter based on a single attribute or multiple attributes in combination. These instructions were written for MS Office Excel 2007.

The instructions below will walk you through turning on the "Filter" function and provide brief exercises to familiarize you with its use.



#### How to turn on the Filter function

1. Select Row 1 in the spreadsheet by clicking on the "1" in the row. The complete row will be highlighted.

		9	) - (	₩ - ₩							RE-Power	ng Screenin	g Dataset	- Microso	oft Excel
C	Рн	Home	e	Insert Page Layo	ut Fo	rmulas	Data	Review	v	View	Develop	er			
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	A1 🔹 🌈 EPA Region														
	A B C D			E					F						
1	EPA Region ST Program S		Site	ID	Site Name						Address				
2	10	1	AK	Landfill Methane	11020		MERRILL FI	ELD LAN	DFIL	L					
3	10	1	AK	Superfund	AK41700	24323	ADAK NAVA	L AIR ST	ATIO	N		ADAK IS			
4	10	1	AK	Brownfield	118021		AKIAK OLD	CITY TAI	NK FA	RM AND	POWER PL	AN W Bank of	Kuskokwim	River	
5	10	1	AK	Brownfield	59481		ALAKANUK	DUMP SI	TE, S	OUTH B	ANK	Unknown	Unknown		
6	10	1	AK	Brownfield	86681		OLD ALATN	A VILLAG	E SI	ſE		North ban	k Koyukuk F	River	

2. On the tool ribbon, go to the "Data" tab, in Sort & Filter group, click "Filter."



3. Once enabled, an arrow 💌 will appear in Row 1 for each column.

0.		) - (	¥ + ) ∓					<b>RE-Powering</b>	Screening	Dataset - Micros	oft Excel
	Hom	e	Insert Page I	layout	Formulas	Data Revi	ew View	Developer			
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A1 • fx EPA Region											
	А	В	С		D		E		F		
1	EPA Region	ST	Program		Site ID		Site Name		Address		



### Exercise 1: How to filter for sites in your State

- 1. Locate the State column labeled "ST."
- 2. Click on the arrow 🔽 to display the complete list of states and territories included in the dataset.

- 🔺	Α	В	С		D	E					
	EPA Region	ST	Program		Site ID	Site Name					
1					<b>•</b>						
₽₽	<u>S</u> ort A to	Z			11020	MERRILL FIELD LANDFILL					
Z↓	S <u>o</u> rt Z to	A			AK4170024323	ADAK NAVAL AIR STATION					
	Sort by C	olor			118021	AKIAK OLD CITY TANK FARM AND POWER PL					
	Joig by C			-	59481	ALAKANUK DUMP SITE, SOUTH BANK					
W.	Clear Filt	er Fro	m "ST"	-	86681	OLD ALATNA VILLAGE SITE					
	Filter by (	Color			AKSFN1002098	USDOI BLM RED TOP MINE					
	Text Filter	re .			140181	FORMER CITY POWER HOUSE					
	Text Inter	·		_	140182	FORMER DIESEL TANK FARM000					
	🖌 🖌 🔁	elect	All)	^	140183	FORMER CITY GASOLINE TANK FARM					
	🖌 😽				140184	OLD AP&I GENERATOR BUILDING					
	🖌 AL			-	34903	3130, 3142, AND 3150 MOUNTAIN VIEW DRIVE					
	AR				AKD981767403	ALASKA RAILROAD CORP					
	AZ				AK8570028649	ELMENDORF AIR FORCE BASE					
					AK6214522157	FORT RICHARDSON (USARMY)					
					35081	MOUNTAIN VIEW SUBDIVISION B/W 5TH AVE. & P					
					146562	MULDOON ESTATES TRACT A					
					100821	PEACOCK CLEANERS					
				~	11358	SHIP CREEK (KNIK ARM POWER PLANT)I					
					AKD980978787	STANDARD STEEL & METAL SALVAGE YARD (US					
		OK	Cancel	J I	124925	WILHOUR TRUST PROPERTY AND WARNER TRU					
			1	.:	60462	WIZARD WASH TESORO STATION					
23	10	AK	Brownfield		35061	3901 MOUNTAIN VIEW DRIVE					
24	10	AK	Brownfield		124922	JOHN'S MOTEL AND RV PARK					
25	10	AK	AML		AKSFN1002134	MOUNTAIN TOP MINE					
26	10	AK	Brownfield		115962	FORMER ALASKA VILLAGE ELECTRIC COMPANY					
27	10	AK	Brownfield		65541	OLD AVEC SITE					
14 4	F ► ► R	ead I	Me 🏑 Screening C	rite	ria 🔒 Data 🤇 📍						

3. Uncheck the "(Select All)" default option. Scroll down and select the state(s) of interest. For this example, the filter is applied to identify sites in Colorado (CO).

	A	В	С		D	E			
1	EPA Region	ST	Program		Site ID	Site Name			
	Cart A to	7	Į		11020				
Z +	<u>2011 A 10</u>	2		ł	AKA170024222				
Ă↓	S <u>o</u> rt Z to A				112021	AKIAK OLD CITY TANK FARM AND POWER PLAN			
	Sor <u>t</u> by C	olor		- F	50/121	ALAKANUK DUMP SITE SOUTH BANK			
The second	Class Filt	or Ero	-CT-		86681	OLD ALATNA VILLAGE SITE			
~	Clear Filo	errio	111 - 51	ł	AKSEN1002098	USDOLBLM RED TOP MINE			
	F <u>i</u> lter by (	Color			140181	FORMER CITY POWER HOUSE			
	Text <u>F</u> ilter	rs		- F	140182	FORMER DIESEL TANK FARMIN			
		oloct	ND.		140183	FORMER CITY GASOLINE TANK FARM			
		, elect	-m/	-	140184	OLD AP&T GENERATOR BUILDING			
					34903	3130, 3142, AND 3150 MOUNTAIN VIEW DRIVE			
		2			AKD981767403	ALASKA RAILROAD CORP			
	AZ	2			AK8570028649	ELMENDORF AIR FORCE BASE			
		4			AK6214522157	FORT RICHARDSON (USARMY)			
	🗸 CC	<b>D</b>		35081 MOUNTAI		MOUNTAIN VIEW SUBDIVISION B/W 5TH AVE. & P			
	CT				146562	MULDOON ESTATES TRACT A			
	DC	2			100821	PEACOCK CLEANERS			
	DE			~	11358	SHIP CREEK (KNIK ARM POWER PLANT)I			
				51	AKD980978787	STANDARD STEEL & METAL SALVAGE YARD (US			
		OK	Cancel		124925	WILHOUR TRUST PROPERTY AND WARNER TRU			
					60462	WIZARD WASH TESORO STATION			
23	10	AK	Brownfield		35061	3901 MOUNTAIN VIEW DRIVE			
24	10	AK	Brownfield		124922	JOHN'S MOTEL AND RV PARK			
25	10	AK	AML		AKSFN1002134	MOUNTAIN TOP MINE			
26	10	AK	Brownfield		115962	FORMER ALASKA VILLAGE ELECTRIC COMPANY			
27	10	AK	Brownfield		65541	OLD AVEC SITE			
14	► ► R	lead I	Me 📈 Screening (	Crite	ria 📃 Data 🧷				



4. Click "OK" to apply the filter. You will now see only sites located in the State of Colorado. In the current dataset, there are 582 Colorado sites.

EPA Region	ST	Program	Site ID	Site Name
08	CO	AML	CON000802791	GENEVA CREEK WATERSHED AREA
08	CO	Brownfield	12135	MORRISON ROAD CLEANUP
08	CO	Brownfield	12132	MOUSE TRAP STORAGE
08	CO	Brownfield	12133	WASHINGTON STREET CORRIDOR
08	CO	Brownfield	11133	HELLER
08	CO	Superfund	CO5210020769	ROCKY MOUNTAIN ARSENAL (USARMY)
08	CO	Brownfield	136964	PINK ELEPHANT

Note: Once the filter is applied, the arrow  $\blacksquare$  will change to a new icon with a filter and arrow  $\blacksquare$  to indicate that a filter has been applied to that particular column. Highlighting in the filtered column is shown for demonstration purposes only.

### Exercise 2: How to apply multiple filters

Now that you have successfully applied a filter to show sites in a single state, add three more filters to the dataset to identify sites with the following characteristics:

- Located in the State of Colorado (CO) (Completed in Exercise 1)
- Landfills tracked through EPA's Landfill Methane Outreach Program (LMOP)
- Positive screening result for "Solar PV: Large-scale"
- Landfill status of "Closed"

Apply each filter as follows:

- 1. Locate the EPA/State Program column labeled, "Program" (Column B).
- 2. Click on the arrow 🔽 to display the dropdown list. Select "Landfill Methane Outreach Program" and click "OK."



Note: This dropdown list reflects only those options available after the application of the first filter in Exercise 1. In this example, it will show only EPA programs associated with sites in Colorado, e.g., AML, Brownfield, LMOP, RCRA, and Superfund.



3. Repeat the filtering process using the "Solar PV: Large-scale" column and by selecting "X" for positive screening results.

	Α	В	С	D			E	V	W
1	EPA Region	ST	Program	Site ID		Site	Solar PV: Large scale	Solar PV: Off- grid	
	08	co	Landfil Methane	1738	NORTH WELD LF	A z↓ z∣	Sort A to Z		x
10761	08	со	Landfill Methane	1718	DENVER ARAPAH	A.	Sort by Color	V/ Large c =	x
10770	08	со	Landfill Methane Outreach Program	1742	LOWRY LANDFILL	*	Filter by Color Text Filters	> carge sim	x
10781	08	со	Landfill Methane Outreach Program	1719	BOULDER LANDFI		(Select All)		х
10795	08	со	Landfill Methane Outreach Program	1720	COLORADO SPRIN		(Blanks)		x
10801	08	со	Landfill Methane Outreach Program	1723	TEMPLETON GAP				x
10810	08	со	Landfill Methane Outreach Program	1716	TOWER LANDFILL				x
10874	08	со	Landfill Methane Outreach Program	1717	YORK & SH 224		ОК	Cancel	х
10876	08	со	Landfill Methane Outreach Program	1735	SUMMIT COUNTY	x			
10891	08	со	Landfill Methane Outreach Program	1739	DENVER REGIONA	AL LAI	NDFILL (NORTH)	x	х
I4 4 >	08 ▶ Rea	CO d Me	Landfill Methane	1737 Data 🕅			NDEILL (SOUTH)	x	x

4. Repeat the filtering process for Landfill Status by selecting "Closed."

08     CO     Landtil Methane Outreach Program     1742     LOWRY LANDE LOWRY LANDE 08     21 X Lowry Lande Courteach Program     Sort A to Z Sort Z to A     1966       08     CO     Landtil Methane Outreach Program     1719     BOULDER LAN BOULDER LAN     Sort by Color     1972	ar I
08     CO     Landfill Methane Outreach Program     1742     LOWRY LANDF     21 X J Soft A to Z     Soft A to Z     1966       08     CO     Landfill Methane Outreach Program     1719     BOULDER LAN     Soft by Color     1972	r
08         CO         Landfill Methane         1719         BOULDER LAN         Sort by Color         1972	
08 CO Landfill Methane 1719 BOULDER LAN Sort by Color 1972	
Outreach Program	T,
	+
08 CO Landfill Methane 1723 TEMPLETON G Filter by Color 1957	
Outreach Program	
08 CO Landfill Methane 1717 YORK & SH 22	T,
Outreach Program	+
08 CO Outreach Program 1739 DENVER REGI 1984	1
	$^{+}$
08 CO Landii Methane 1737 DENVER REGI	1
Outreach Program	ľ
	+
08 CO Contracto Discourse 1724 SOUTH CANY( 1953	1
	$\downarrow$
08 CO Landfil Methane 2417 JEFFCO #1	
Unreach Program	+



After applying these four filters, you should have narrowed the dataset from over 60,000 sites to four:

EPA Region	ST	Program Site ID Site Name		Site Name	Solar PV: Large scale	Landfill Status
08	со	Landfill Methane Outreach Program	1723	TEMPLETON GAP LANDFILL, INC.	x	Closed
08	со	Landfill Methane Outreach Program	1739	DENVER REGIONAL LANDFILL (NORTH)	x	Closed
08	со	Landfill Methane Outreach Program	1737	DENVER REGIONAL LANDFILL (SOUTH)	x	Closed
08	со	Landfill Methane Outreach Program	1736	CENTRAL WELD COUNTY LANDFILL	x	Closed

In general, most filter-based searches will yield a greater number of sites. This exercise demonstrates the ability to use this large dataset to target a set of sites, which could be used for planning or development purposes.

#### Exercise 3: How to remove filters

If you would like to change your filter-based search, you may clear the filters two ways.

#### To remove an individual filter

1. Click on the filter icon *in the lower right of the desired column header.* 



2. Click "Clear Filter from "<attribute name>," e.g., "Program" in this example. Once the filter has been removed, the arrow will reappear in that single column.



#### To remove all filters

1. On the tool ribbon, go to the "Data" tab, in Sort & Filter group, click "Clear."



2. Once the filters have been removed, the arrow will reappear in all affected columns. The complete dataset will once again be visible.

#### **Creating Summary Reports with PivotTables**

Pivot tables are a convenient way to view and summarize large datasets. The RE-Powering Screening Dataset spreadsheet offers many opportunities for data mining the renewable energy potential on contaminated lands, landfills, and mine sites.

The instructions below will walk you through creating a pivot table and provide brief exercises to familiarize you with their use.

#### How to create a PivotTable

1. On the "Data" worksheet, select the complete dataset.

TIP: To select the complete dataset, click in Cell A1. Then, holding down the SHIFT and CTRL keys, hit the right arrow, followed by the down arrow. This will select the full data set. In this case, Cells A1 to CM66306 will be selected.

On the tool ribbon, go to the "Insert" tab. In the Tables group, click "Pivot Table."





2. To create the PivotTable in a new worksheet, click "OK."



3. On a new worksheet, you will now see an empty PivotTable and a PivotTable Field List pop-up window.

	А	В	С	D	E	F	G	Н	1	J	K
1											
2		_									
3				PivotTab	le Field List						▼ ×
4		PivotTable	1	_							
5		1 Hotrabio		Choose f	ields to add t	o report:					
6	To build a	report, cho	oose fields	EPA P	Region						<u> </u>
1	from the	PivotTable	Field List	ST	-						
8				Progr	am						
9				Site I	D						
11		-		Site	lame						-
12	EBEE	Ξ		Addre	ess						
12	E E E E			City							-
14				Coun	tv						
15					ode						
16				Feder	al Facility						
17				Feder	al Facility Ac	encv					
18				- Karawa	- 1 481						<u>~</u>
19											
20				Drag field	is between a	reas below:					
21				Y Rep	ort Filter			Colum	n Labels		
22				_							
23				_							
24											
25				Rov	v Labels			Σ Values	5		
26				_							
21											
20				_							
30				🗌 Defe	r Layout Upda	ate					Jpdate
31											
32											
14	► ► Re	ad Me 🖉 🤉	Screenina Cr	iteria Sh	eet1 Dat	a ∕ <b>?⊐</b> ∎4	-		:		

TIP: The PivotTable Field List is a pop-up window that is only available when the cell or range of cells selected is within the bounds of the PivotTable. If you click outside of the PivotTable, the Field List pop-up will disappear. If you close the Field List and wish to reopen it, click in the PivotTable in order to show the PivotTable Tools in the ribbon. On the "Options" tab, in the "Show/Hide" group, click "Field List."

PivotTable To	ols							
Options	Design							
	B						4	
Change Data Source +	Clear	Select	Move PivotTable	PivotChart Formulas	OLAP tools *	Field List	+/- Buttons	Field Headers
Data		Action	ns	Tools		1	Show/Hid	le



#### Exercise 4: How to create a summary table for Utility-Scale Solar Potential by EPA Region

1. In the PivotTable Field List, click on "EPA Region" and drag it to "Row Labels" in the bottom left corner. Once complete, the PivotTable will list all ten EPA regions in the column to the left.



2. For this example, scroll down the field list and select "Solar PV: Utility Scale." Drag and drop it into "Values" in the bottom right corner of the PivotTable Field List.

PivotTable Field List		▼ x
Channel California and the second		<b>₫</b> -
Choose fields to add to report:		<u> </u>
Landfill Owner Type		^
Latitude		
Acres		-
State Renewable Portfolio Standard (RPS)		
Renewable Energy Zones (REZ)		
Solar PV: Utility scale		
Solar PV: Policy driven	1	
Solar PV: Large scale		
Solar PV: Off-grid		
Solar PV: Mega Utility scale - CA only		~
Drag fields between areas below:		
Y Report Filter	Column Labels	
		/
Row Labels	Σ Values	
EPA Region 👻	Count of Solar PV: Utility scale	l k
Defer Layout Update		Update



Once complete, the PivotTable will show a second column labeled "Count of Solar PV: Utility scale." This value represents the number of sites in each region with Utility-Scale Solar PV potential.

Row Labels 💌 Count of S	olar PV: Utility scale
01	
02	19
03	
04	1
05	
06	116
07	21
08	175
09	1079
10	169
Grand Total	1580

#### Exercise 5: How to add additional attributes to the PivotTable

While it is useful to know the number of sites with utility-scale solar PV potential, you may also want to see the estimated solar capacity or how much solar could be installed on these sites.

 Because you want to show values only associated with sites that screened positively for "Solar PV: Utility scale," you will need to add this attribute as a filter. Scroll down the field list and select "Solar PV: Utility scale". Drag and drop it into "Report Filter" in the top left corner of the PivotTable Field List.

Solar PV: Utility scale (All)	PivotTable Field List	•
Row Labels Count of Solar PV: Utility scale	Choose fields to add to report:	
19       02     19       03     1       04     1       05     116       06     116       07     21       08     1       09     9       10     169       Grand Total     1580	Acres Acres State Renewable Portfolio Standard (RPS) Renewable Energy Zones (REZ) Solar PV: Utility scale Solar PV: Dicy driven Solar PV: Large scale Solar PV: Off-grid Solar PV: Mega Utility scale - CA only CSP: Striing Engine CSP: Trough and Power Tower	▼
	Drag fields between areas below: ✓ Report Filter Solar PV: Utility scale	Column Labels
	EPA Region	∑ Values Count of Solar PV: Utility scale ▼
	Defer Layout Update	Update



Once complete, a new row will now show above the PivotTable, indicating a filter for "Solar PY: Utility scale" is available, but not yet applied as indicated by the "(All)" designation and the arrow dropdown.

Solar PV: Utility sca	le (All)
Row Labels	Count of Solar PV: Utility scale
01	
02	19
03	
04	1
05	
06	116
07	21
08	175
09	1079
10	169
Grand Total	1580

To apply the filter, click on the arrow 🔽 and select "X". Click Ok to apply the filter.

Solar PV: Utility scale	(All)	-	
	: (All)		
Row Labels			
01	(blank)		
02			
03			
04			
05			
06			
07			
08			
09		-1	
10	Select Multiple Items		
Grand Total	OK Cancel	ור	
		-	
	L	.:	

Once the filter is applied, the PivotTable will no longer show EPA Regions where sites did not meet the screening criteria for Utility-Scale Solar PV. You will now see that Regions 1, 3 and, 5 are no longer listed.

Solar PV: Utility scale	X. X
Row Labels	Count of Solar PV: Utility scale
02	19
04	1
06	116
07	21
08	175
09	1079
10	169
Grand Total	1580



2. Scroll down the field list and select "Estimated Solar PV Capacity Potential." Drag and drop it into "Value" in the bottom right corner of the PivotTable Field List below "Count of Solar PV: Utility scale."

PivotTable Field List	▼ ×			
e	( <b>1</b> -			
Choose fields to add to report:	[33_]			
	~			
Distance to Urban Area (miles)				
Max DNI Solar (kWb/m2/day)				
Fstimated Solar PV Capacity Potentia				
Estimated CSP Capacity Potential (MW)	.(,			
Wind Speed at 50 m				
Wind Speed at 80 m				
Wind Speed at 110 m				
Wind Speed at 140 m				
Estimated Wind Energy Capacity Potential				
Cumulative Biopower Desources (metric tone	chr. w/i 50 miles)			
Drag fields between areas below:				
Report Filter	Column Labels			
Solar PV: Litility scale	Σ Values 🔹			
Solar P Product Scare	2 10000			
Row Labels	Σ Values			
EPA Region 👻	Count of Solar PV: Utility scale			
	Count of Estimated Solar PV Caper P			
Defer Lavout Update	Update			
	openie			

Once complete, a new column will now show in the PivotTable, titled "Count of Estimated Solar PV Capacity Potential (MW)." Because it is displaying the count, the values will match those shown in "Count of Solar PV: Utility scale."

Solar PV: Utility scale	X. X	
	Values	
_		Count of Estimated Solar PV
Row Labels	Count of Solar PV: Utility scale	Capacity Potential (MW)
02	19	19
04	1	1
06	116	116
07	21	21
08	175	175
09	1079	1079
10	169	169
Grand Total	1580	1580



3. To display the cumulative "Estimated Solar PV Capacity Potential (MW)," the PivotTable Value needs to be changed from "Count" to "Sum." Begin by clicking on the arrow on the field description.

PivotTable Field List			▼ ×	
Choose fields to add to report:			<b>I</b> •	
Urban Area Population Distance to Urban Area (miles) Max DNI Solar (kWh/m2/day) Stimated Solar PV Capacity Potential (MW) Stimated CSP Capacity Potential (MW)	W)		~	
Wind Speed at 80 m Wind Speed at 110 m Wind Speed at 140 m Estimated Wind Energy Capacity Potential Cumulative Biopower Resources (metric tons/yr		Move <u>Up</u> Move <u>D</u> own Move to Beginning Move to <u>E</u> nd		
Drag fields between areas below: V Report Filter	<b>P</b>	Move to Report Filter Move to Row Labels		
Solar PV: Utility scale	Σ	Move to Column Labels Move to Values		
Row Labels	×	Remove Field		
EPA Region 🔻	Cou	value Field Settings nt of Estimated Solar PV Capa	city P 🔻	
Defer Layout Update			Update	

- 4. On the pop-up menu, click the "Value Field Settings..." option, which is at the bottom of the menu.
- 5. Select "Sum" from the "Summarize value field by" options in the pop-up window. Click OK.

Value Field Settings	? 🗙				
Source Name: Estimated Solar PV Capacity Potential (MW)					
Custom Name: Sum of Estimated Solar PV Capacity Potential (MW)					
Summarize by Show values as					
Summarize value field by					
Choose the type of calculation that you want to use to summarize the data from selected field					
Sum					
Average Max					
Min Product					
Number Format OK Can	cel				



Once complete, the PivotTable will update to show the cumulative "Estimated Solar PV Capacity." With the "Solar PV: Utility scale" filter applied, this represents the estimated capacity only at sites that met the associated screening criteria.

Solar PV: Utility scale	X. X	
	Values	
		Sum of Estimated Solar PV
Row Labels	Count of Solar PV: Utility scale	Capacity Potential (MW)
02	19	575
04	1	778
06	116	599,844
07	21	5,792
08	175	354,369
09	1079	2,696,631
10	169	252,054
Grand Total	1580	3,910,044

#### Exercise 6: How to add details within a PivotTable

From the summary level, having the ability to view more specific data is often helpful to gain a better understanding of the main drivers in the data. In this example, you will now add two layers below the EPA Region: (i) State; (ii) Site Name.

1. Select "ST" from the field list. Drag and drop it into "Row Labels" in the bottom right corner of the PivotTable Field List below "EPA Region."

PivotTable Field List	▼ x
Choose fields to add to report:	
✓ EPA Region	<u>^</u>
✓ST	▼ 3
Program	
Site ID	
Site Name	
Address	
City	
County	
Zip Code	
Federal Facility	
Federal Facility Agency	~
Drag fields between areas below:	
Report Filter	Column Labels
Solar PV: Utility scale 🔹	∑ Values
Row Labels	Σ Values
EPA Region 🔻	Count of Solar PV: Utility scale 🔻
ST 🔻	Sum of Estimated Solar PV Capacity Pot 🔻
Defer Layout Update	Update



	Values		
		Sum of Estimated Solar PV	
Row Labels	Count of Solar PV: Utility scale	Capacity Potential (MW)	
	19	575	
PR	19	575	
	1	778	
FL	1	778	
	116	599,844	
NM	40	552,609	
OK	36	17,805	
TX	40	29,431	
<b>07</b>	21	5,792	
KS	15	2,699	
NE	6	3,094	
<b>E 08</b>	175	354,369	
00	89	137,994	
MT	7	54,518	
SD	8	1,751	
ப	53	157,867	
WY	18	2,238	
<b>09</b>	1079	2,696,631	
AZ	69	720,733	
CA	789	1,722,991	
HI	192	88,509	
NV	29	164,398	
<b>E</b> 10	169	252,054	
ID	34	8,256	
OR	131	183,874	
WA	4	59,924	
Grand Total	1580	3,910,044	

Once complete, the PivotTable will display the data by EPA Region, then by State.



2. To add the site level information, select "Site Name" from the field list. Drag and drop it into "Row Labels" in the bottom right corner of the PivotTable Field List below "EPA Region" and "ST."





Once complete, the PivotTable will now show each Site Name below the EPA Region and State. For illustration purposes, only a subset of results for Region 6 in New Mexico are shown, while results for other regions can be viewed using by clicking on the "+" mark to expand the information in the table under each EPA Region.

Solar PV: Utility scale	X	
	Values	
		Sum of Estimated
	Count of Solar PV:	Solar PV Capacity
Row Labels	Utility scale	Potential (MW)
±02	19	575
III 04	1	778
■ 06	116	599,844
	40	552,609
27 SOW AFSOC USAF CANNON AFB NM	1	750
AT&SF (ALBUQUERQUE)	1	15
BOSTON HILL	1	83
CAMINO REAL LANDFILL	1	21
CERRILLOS GRAVEL PITS	1	33
CERRILLOS HILLS MINING DISTRICT	1	72
CERRO COLORADO LF	1	60
CHEVRON QUESTA MINE	1	1,460
DEL NORTE GUN CLUB	1	9
FORMER (OR SOUTH) EUBANK LANDFILL	1	14
FORMER MUNICIPAL LANDFILL	1	50
FORT WINGATE DEPOT ACTIVITY	1	3,635
GANDY MARLEY INC TRIASSIC PARK	1	80
HOLLOMAN AIR FORCE BASE	1	9,940
KIRTLAND AFB	1	8,593
LEE ACRES LANDFILL (USDOI)	1	10
LOS ANGELES LANDFILL	1	13
NASA JSC WHITE SANDS TEST FACILITY	1	10,000
NAVAJO REFINING COMPANY LLC	1	123
NORTHEASTERN NEW MEXICO REGIONAL LANDF	FIL 1	72



### **RE-Powering America's Land Initiative: Additional Tools & Resources**

#### **RE-Powering Mapper**

The spreadsheet discussed in this reference guide is one component of the RE-Powering Mapper tool. The components and associated documentation include:

- RE-Powering Mapper
  - o RE-Powering Mapper: Google Earth overlay with RE-Powering Screened Sites
  - o <u>RE-Powering Screening Dataset</u>
  - Data Documentation for Mapping and Screening Criteria for Renewable Energy Generation Potential on EPA and State Tracked Sites
  - o RE-Powering Screening Results: National Maps by Technology
  - Fact Sheets
    - <u>RE-Powering Mapper</u>
    - RE-Powering Solar Technologies
    - RE-Powering Wind Technologies
    - RE-Powering Biomass Technologies
    - RE-Powering Geothermal Technologies

#### **Other Site Screening & Feasibility Assessment Tools**

- Site Screening
  - o <u>RE-Powering Solar Decision Tree</u>
  - RE-Powering Wind Decision Tree
- EPA-NREL Feasibility Studies

Disclaimer: The RE-Powering Mapper and associated documents are provided solely as general information on screening potentially or formerly contaminated lands, landfills, and mine sites for renewable energy potential. It does not address all information, factors, or considerations that may be relevant in a particular situation. Results do not reflect an endorsement or recommendation for development potential by EPA. References to third-party publications, websites, commercial products, process, or services by trade name, trademark, manufacturer, or otherwise, are for informational purposes only. No endorsement or recommendation should be inferred and is not implied. EPA, NREL and the United States Government do not endorse any non-federal product, service or enterprise.

