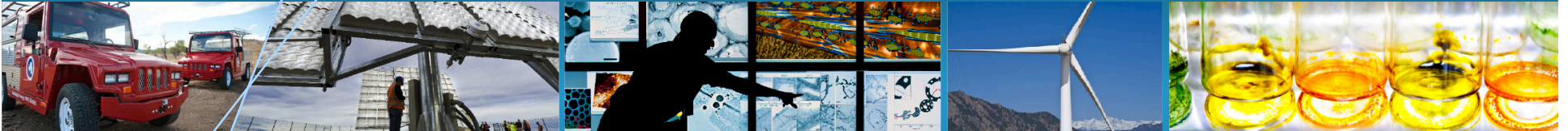


OpenEI: Energy Information



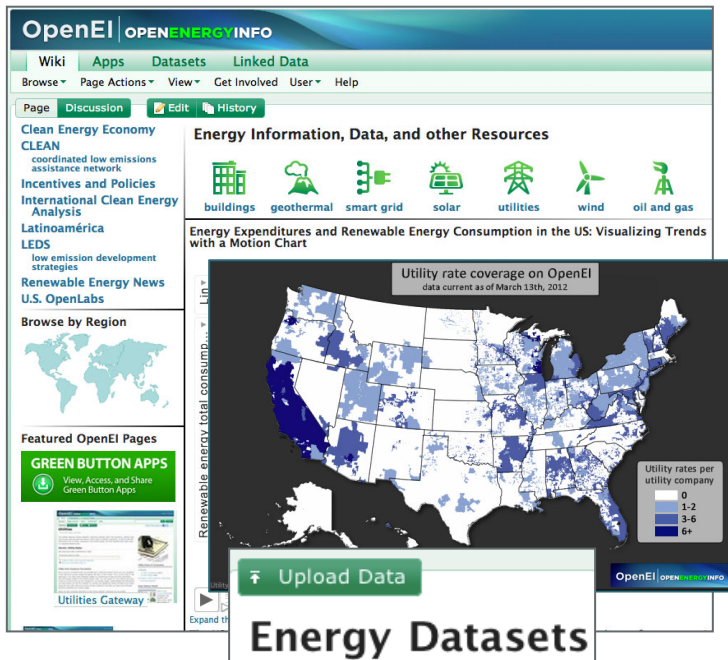
Linked Open Data Success Stories

Jon Weers

May 16th, 2012

IMPACT AND OVERVIEW

<http://en.openei.org>



Energy Datasets

Project Description

OpenEI is a free and open knowledge sharing platform created to facilitate access to energy-related data, models, tools, and information.

Sponsored by the Department of Energy, and developed by the National Renewable Energy Lab, in support of the **Open Government Initiative**, OpenEI strives to make energy-related data and information searchable, accessible, useful to both people and machines.

Built utilizing the standards and practices of the **Linked Open Data** community, the OpenEI platform is much more robust and powerful than typical web sites and databases. All users can search, edit, contribute, and access data in OpenEI; all for free.

OpenEI Statistics *

- 756,000+ web visits from 210+ countries
- **Over 800 datasets**
- Creation of **over 56,000 content pages**
- Upload of over 4,600 images and files
- More than 450,000 contributor actions
- Over 586,000 unique visitors
- More than 3,400 registered users
- Over 8,000 Twitter followers
- More than 500 Facebook fans
- Over 17.2 million RDF triples

**per Google Analytics as of April 30, 2012*

OPEN GOV

Open Government Initiative

OpenEI supports the U.S. Department of Energy's fulfillment of open government standards: transparency, public participation, and collaboration.

Data Analysis and Visualization Group

Project Lead:

Debbie Brodt-Giles, NREL
Debbie.brodt.giles@nrel.gov

Project History and Timeline

- | | |
|-----------|--|
| Sep. 2009 | Launched OpenEI: Wiki |
| Dec. 2009 | OpenEI confirmed as DOE's Open Government Initiative (OGI) |
| Apr. 2010 | Recognized by White House as a Flagship Open Government Initiative |
| Oct. 2010 | Launched OpenEI: Datasets |
| Jan. 2011 | Featured on White House Innovations Gallery |
| Jan. 2012 | Launched OpenEI: Apps |

A PLATFORM OF PLATFORMS

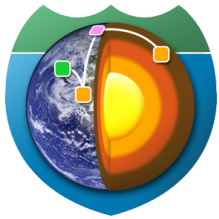
<http://en.openei.org>

OpenEI consists of several open source platforms which have been custom-integrated for optimal collaboration and to allow a seamless user experience.

- **Wiki** – Built upon the same underlying technology as Wikipedia
- **Datasets** – Utilizes Drupal and Amazon data storage services
- **Linked Open Data** – Semantic wiki extensions and a Virtuoso triple store
- **Apps** – Simile Exhibit based display of extracted wiki data
- **Community** – Drupal Commons install currently in beta



High-Profile LOD Projects on OpenEI



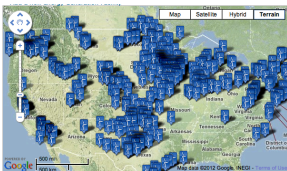
- Policy and Regulatory Overview integration (Country Pages)
- Geothermal Regulatory Roadmap & Exploration Database



- Utility Rate Database



- ISGAN Smart Grid Glossary



- Map of Wind Farms

LINKED OPEN DATA: COUNTRY PAGES

<http://en.openei.org>

OpenEI country pages are rich with semantic integration. Content is consumed from numerous linked open data providers.

The screenshot displays the OpenEI page for India's energy resources. It includes a map of India, a table of energy resources, and several external links and tools.

Resource	Value	Units	Rank	Period	Source
Wind Potential	0	Area(km ²) Class 3-7 Wind at 50m	120	1990	NREL
Solar Potential	9,877,095,200	MWh/year	8	2008	NREL
Coal Reserves	66,800.07	Million Short Tons	5	2008	EIA
Natural Gas Reserves	1,075,000,000,000	Cubic Meters (cu m)	26	2010	CIA World Factbook
Oil Reserves	5,800,000,000	Barrels (bbl)	23	2010	CIA World Factbook

Energy Maps featuring India

- India Solar Resource
- India Solar Resource
- India Solar Resource

Country Profile

- Name: India
- Population: 1,028,610,328
- GDP: \$1,843,000,000,000
- Energy Consumption: 19.95 Quadrillion Btu
- 2-letter ISO code: IN
- 3-letter ISO code: IND
- Numeric ISO code: 356
- UN Region: Southern Asia

OpenEI Resources

- Energy Maps: 72 view
- Tools: 21 view
- Programs: 45 view
- Energy Organizations: 63 view
- Research Institutions: 2 view

2 News Articles

- India makes a sizable investment in Hydro
- India taps into its massive solar potential

45 Programs

- Low Emissions Asian Development (LEAP) Program
- Capital Markets Climate Initiative
- CDKN-India-Low Carbon and Climate Development Planning
- WRI-India-Measurement and Performance Tracking (MAPT) Initiative
- UNEP-Low Carbon Transport in India

21 Tools

- Geospatial Toolkit
- Energy Technology Systems Analysis (MARKAL)
- India National Action Plan on Climate Change
- Nationally Appropriate Mitigation Action (NAMA) Study
- Low-Carbon Growth Country Study
- Started Experience from Six Countries (SE6C)

63 Energy Organizations

- VIT TBI
- Vish Wind Infrastructure Pvt. Ltd
- Turboatom TPS Projects Ltd
- TREC STEP
- Trans Tech Green Power

reegle Policy and Regulatory Overview

India Policy and Regulatory Overview

Extend network

Population Access to Electricity (2008): 64.5%

Rural: 52.5%
Urban: 93.1%

The Integrated Energy Policy states that "Access to electricity is very uneven. Around 57% of rural and 12% of urban households i.e. 84 million households (over 44.2% of total) did not have electricity in 2000. Even those who have access to electricity suffer from shortages and poor quality of supply. Unscheduled outages, load shedding, fluctuating voltage and erratic frequency are common. Consumers and the economy bear a large burden of the consequences of this poor quality of supply." Currently, some 404.5 million people do not have electricity. The majority of electricity transmission infrastructure is operated at 132 kV or above, and five regional grids serve the country, connecting the Northern, Southern, Western, Eastern and North-Eastern regions.

Energy procedure

The policies and plans are developed on a five-year basis, apart from the annual plans. Each department/ ministry prepares plans, which go as inputs to the 'Five Year Plan' prepared by the Planning Commission of India. The government is also developing a scheme for energy efficiency trading as part of its National Action Plan on Climate Change. Under the proposed scheme of Perform, Achieve, Trade (PAT), specific industries

GEOHERMAL: STORING DATA IN THE WIKI

<http://en.openei.org>

The Geothermal Exploration Database on OpenEI is an example of a project designed from the ground up to leverage the advantages of a semantic wiki as a data structure to solve real world problems.

Location

Power Plants/Projects →

Blundell 1 Power Plant



Geothermal Area →

Roosevelt Hot Springs



Geothermal Region

Northern Basin & Range



Exploration Techniques

Category →

Remote Sensing



Subcategory →

Active Sensors



Subcategory →

Radar



Technique

InSAR

Activities

Source +

(Reference)



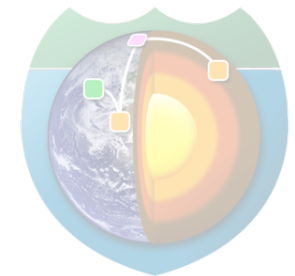
Geothermal Area +

Dixie Valley Area



Exploration Technique

Water Sampling



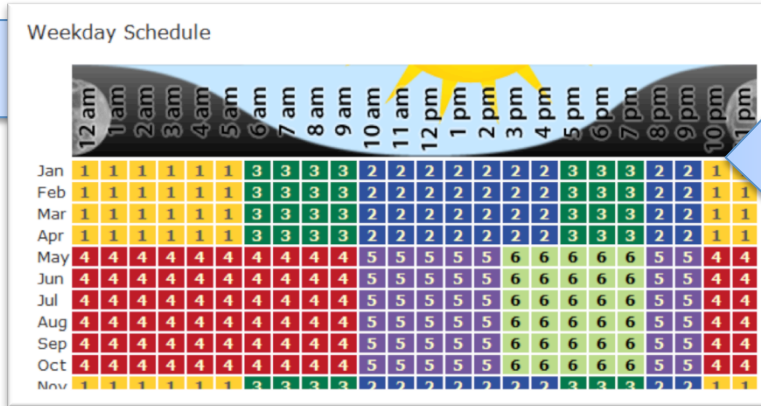
OPENEI: UTILITY RATE DATABASE

<http://en.openei.org>

The OpenEI **Utility Rate Database** features over **3,600 utility rates**,

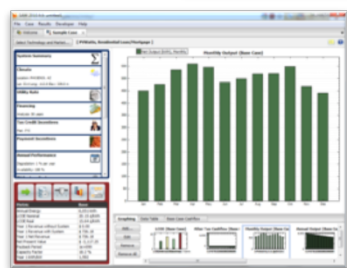
```
{
  "incentive_name": {
    "type": "literal",
    "value": "Interconnection Standards (Utah)"
  },
  "incentive_page": {
    "type": "uri",
    "value": "http://openei.org/wiki/Interconnection_Standards_(Utah)"
  }
}
```

served as RDF, JSON, CSV, restful API to



(stored as wiki data objects)

stored in full resolution and complexity.



internal apps and widgets,

DSIRE™
Database of State Incentives for Renewables & Efficiency

Find Incentives that apply to you

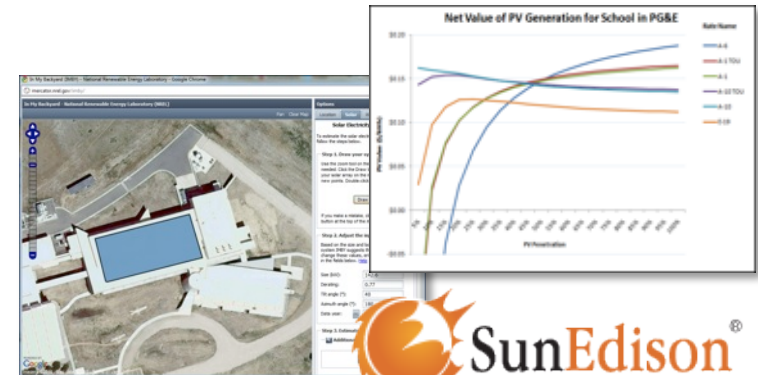
Renewable Energy
 Energy Efficiency

Colorado
Homeowner or renter

Incentives Found: **0075**

View Incentives

Powered by OpenEI.org
U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy
IREC Interstate Renewable Energy Council
SOLAR CENTER



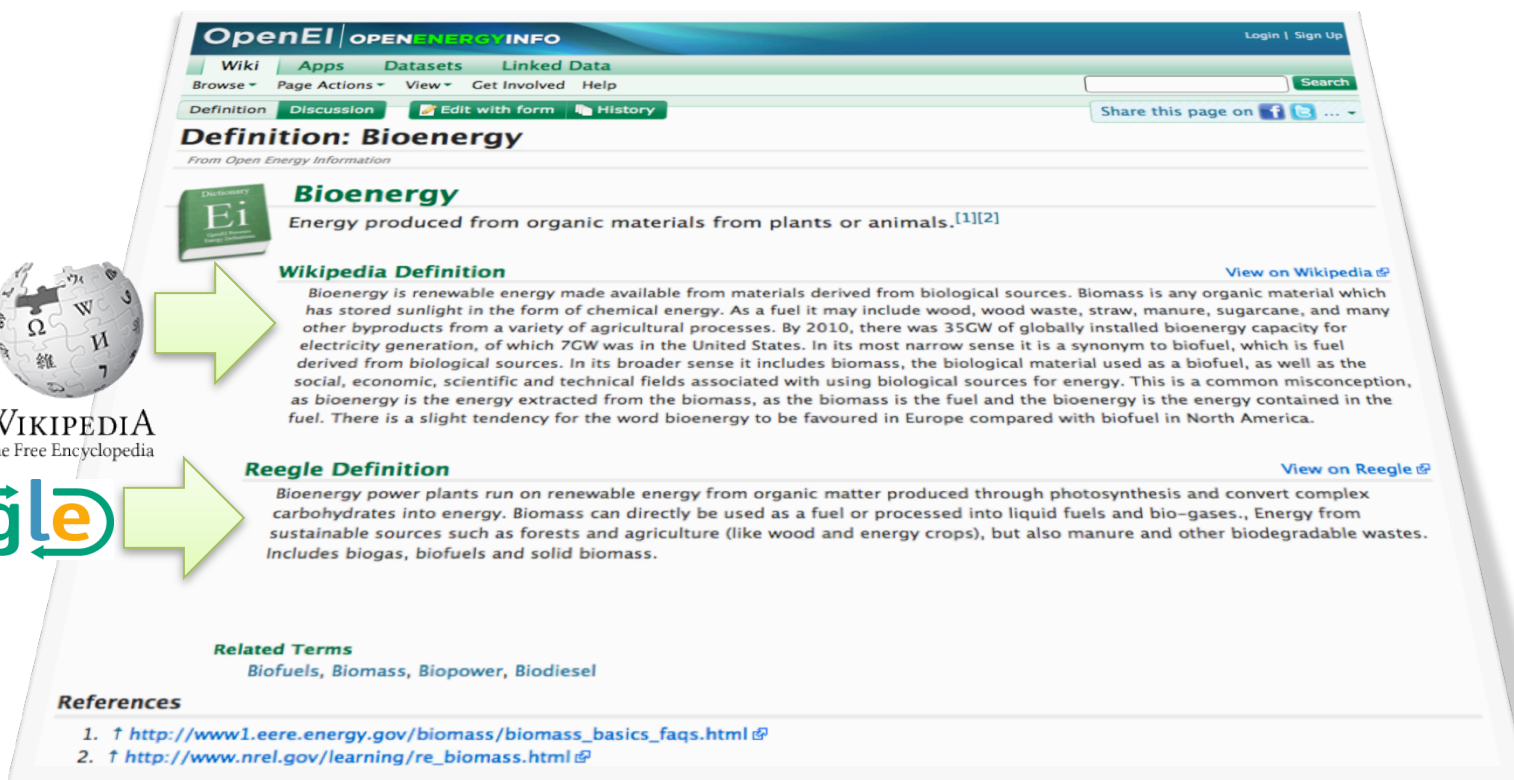
and external sites and industry.

OPENEI: SMART GRID GLOSSARY

<http://en.openei.org>

Simple LOD Consumption to Empower the Masses

By supplementing our definitions with those of reegle and Wikipedia, OpenEI can empower users to consider multiple sources of information and make informed discoveries without leaving the page. Definitions are just the beginning!



The screenshot displays the OpenEI website interface for the 'Bioenergy' page. The page features a navigation bar with 'Wiki', 'Apps', 'Datasets', and 'Linked Data'. Below the navigation, there are tabs for 'Definition', 'Discussion', 'Edit with form', and 'History'. The main content area is titled 'Definition: Bioenergy' and includes a 'From Open Energy Information' section with a definition: 'Energy produced from organic materials from plants or animals.' [1][2]. Below this, there are two sections: 'Wikipedia Definition' and 'Reegle Definition'. The Wikipedia definition states: 'Bioenergy is renewable energy made available from materials derived from biological sources. Biomass is any organic material which has stored sunlight in the form of chemical energy. As a fuel it may include wood, wood waste, straw, manure, sugarcane, and many other byproducts from a variety of agricultural processes. By 2010, there was 35GW of globally installed bioenergy capacity for electricity generation, of which 7GW was in the United States. In its most narrow sense it is a synonym to biofuel, which is fuel derived from biological sources. In its broader sense it includes biomass, the biological material used as a biofuel, as well as the social, economic, scientific and technical fields associated with using biological sources for energy. This is a common misconception, as bioenergy is the energy extracted from the biomass, as the biomass is the fuel and the bioenergy is the energy contained in the fuel. There is a slight tendency for the word bioenergy to be favoured in Europe compared with biofuel in North America.' The Reegle definition states: 'Bioenergy power plants run on renewable energy from organic matter produced through photosynthesis and convert complex carbohydrates into energy. Biomass can directly be used as a fuel or processed into liquid fuels and bio-gases., Energy from sustainable sources such as forests and agriculture (like wood and energy crops), but also manure and other biodegradable wastes. Includes biogas, biofuels and solid biomass.' Below the definitions, there are sections for 'Related Terms' (Biofuels, Biomass, Biopower, Biodiesel) and 'References' (1. ↑ http://www1.eere.energy.gov/biomass/biomass_basics_faqs.html 2. ↑ http://www.nrel.gov/learning/re_biomass.html). To the left of the screenshot, there are three logos: a globe with letters for Wikipedia, the 'Ei' logo for Open Energy Information, and the 'reegle' logo. Green arrows point from these logos to the corresponding definition sections on the screenshot.

Wikipedia
The Free Encyclopedia

reegle

OpenEI | OPENENERGYINFO

Wiki Apps Datasets Linked Data

Browse Page Actions View Get Involved Help

Definition Discussion Edit with form History

Search

Share this page on f t ...

Definition: Bioenergy
From Open Energy Information

Bioenergy
Energy produced from organic materials from plants or animals.^{[1][2]}

Wikipedia Definition [View on Wikipedia](#)

Bioenergy is renewable energy made available from materials derived from biological sources. Biomass is any organic material which has stored sunlight in the form of chemical energy. As a fuel it may include wood, wood waste, straw, manure, sugarcane, and many other byproducts from a variety of agricultural processes. By 2010, there was 35GW of globally installed bioenergy capacity for electricity generation, of which 7GW was in the United States. In its most narrow sense it is a synonym to biofuel, which is fuel derived from biological sources. In its broader sense it includes biomass, the biological material used as a biofuel, as well as the social, economic, scientific and technical fields associated with using biological sources for energy. This is a common misconception, as bioenergy is the energy extracted from the biomass, as the biomass is the fuel and the bioenergy is the energy contained in the fuel. There is a slight tendency for the word bioenergy to be favoured in Europe compared with biofuel in North America.

Reegle Definition [View on Reegle](#)

Bioenergy power plants run on renewable energy from organic matter produced through photosynthesis and convert complex carbohydrates into energy. Biomass can directly be used as a fuel or processed into liquid fuels and bio-gases., Energy from sustainable sources such as forests and agriculture (like wood and energy crops), but also manure and other biodegradable wastes. Includes biogas, biofuels and solid biomass.

Related Terms
Biofuels, Biomass, Biopower, Biodiesel

References

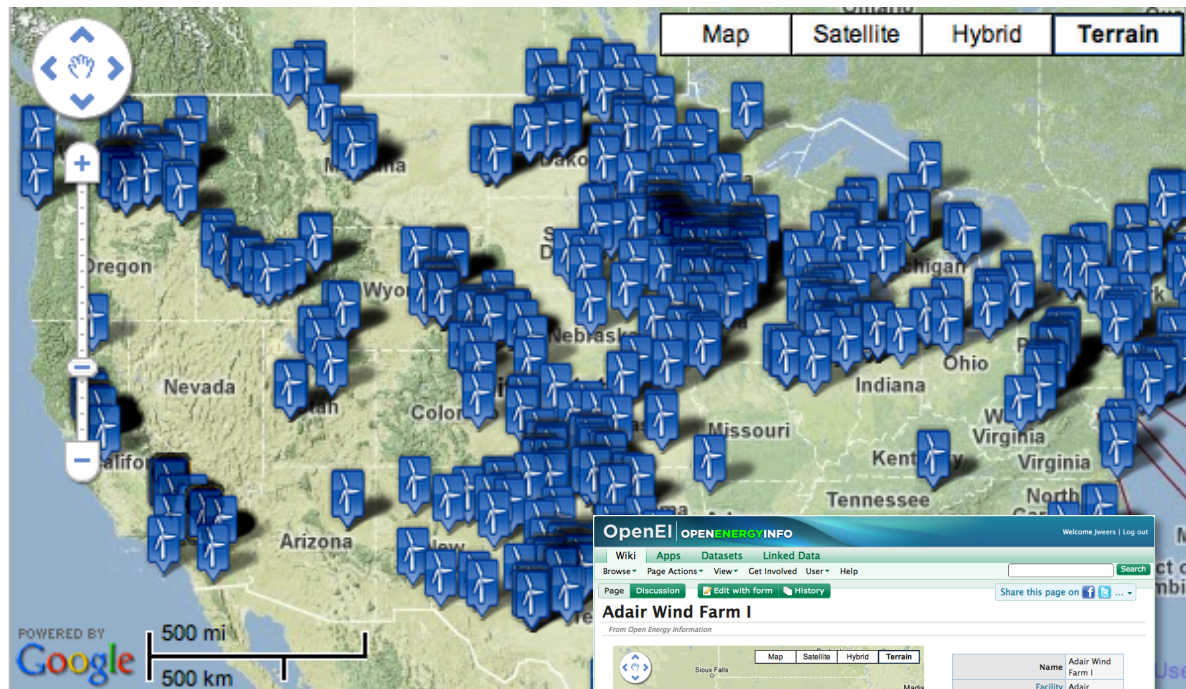
- ↑ http://www1.eere.energy.gov/biomass/biomass_basics_faqs.html
- ↑ http://www.nrel.gov/learning/re_biomass.html

OPENEI: MAP OF WIND FARM

<http://en.openei.org>

Sometimes simple is best.

OpenEI's **Map of Wind Farms** page is consistently one of the site's most popular pages.

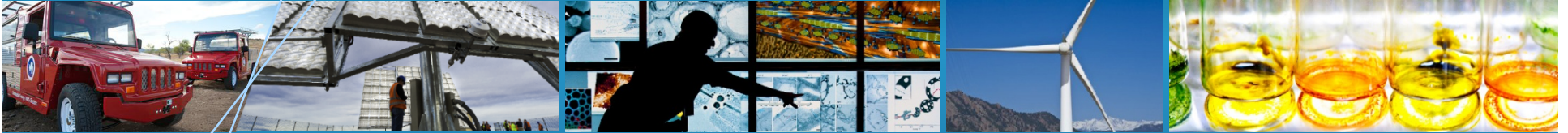


Each wind farm has its own wiki page.

Name	Adair Wind Farm I
Facility	Adair
Sector	Wind energy
Facility Status	In Service
Owner	Shafer Systems
Developer	MidAmerican Energy
Energy Purchaser	Alliant/IES Utilities
Location	Iowa
Coordinates	41.499234°, -94.692628° Display map
Generating Capacity (MW)	0.23
Number of Units	1
Commercial Online Date	1994
Wind Turbine Manufacturer	Vestas
References	[1]



Thank You!



This work was funded by the US Department of Energy



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303-275-3701