Basic Instructions for using the IRENA Atlas for solar mapping
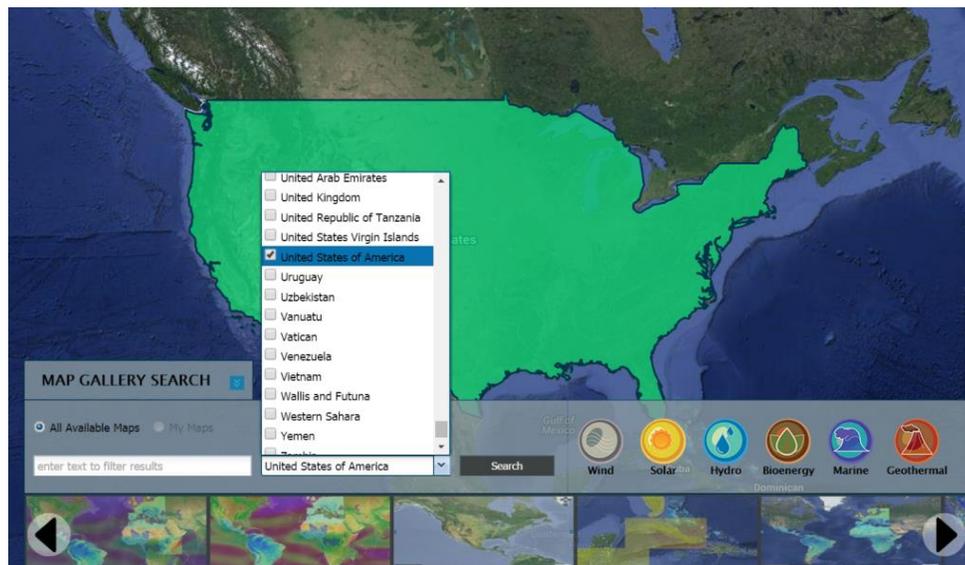
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The IRENA (International Renewable Energy Agency) Global Atlas for Renewable Energy is a database of over 1000 renewable energy datasets that can be overlaid on a world map. These data allow users to visualize the renewable energy potential of wind, solar, geothermal, bioenergy, marine energy, and hydro energy, by geographic location and, in some cases, seasonality. The interface also allows users to overlay additional information such as population density, land use, or topography.

It is not necessary to register in order to use the IRENA Global Atlas but doing so will allow you to save the maps you create, and easily access them at a later date. In order to create an account, click on Sign In/ Register, and follow the instructions.

What follows are simple instructions to map solar energy:

- On the IRENA Atlas homepage (http://irena.masdar.ac.ae) the Map Gallery Search box can be used to filter the maps available by geographic location and energy source of interest.

- From the region/country dropdown menu select your country or countries of interest. This can also be achieved by clicking the countries on the background map. Countries you select will be listed in the box separated by commas. United States of America is selected by default and should be deselected if you don't want it as part of your search.

- Select the Solar icon.

- Click Search.

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- A series of map icons will be displayed which satisfy the search criteria. They can be scrolled through using the large black arrows at the far sides of the Map Gallery Search box. When the mouse icon hovers over a map, a data description will be displayed. This includes such information as where the data came from, what geographic location it covers, and the spatial resolution, i.e. surface area per data point.

- Once you have chosen a dataset, click Open. The dataset will load and will be layered on top of a Google Hybrid Map.

- An extensive and easy to use dataset for solar mapping is the 3TIER Global Wind and Solar Datasets. This provides worldwide average annual GHI (Global Horizontal Irradiance) – the amount of shortwave solar radiation received by a surface horizontal to the ground. The data has a spatial resolution of 3 km, and provides average annual values calculated from over 10 years of data. Further instructions are specific to the 3TIER datasets.

- Scroll through the available maps to the one labeled 3TIER Global Wind and Solar Datasets. The 3TIER dataset can also be navigated to by searching 3TIER in the filter results box.

- Select the 3TIER dataset and click Open.

- When the 3TIER dataset is open the available map layers are displayed on the left of the screen. The default layout is Global Wind. Deselect this and select Global Solar. The map will then display GHI overlaid on a Google Map.

– GHI is color coded from warm colors (high GHI) to cool colors (low GHI). Data is in W/m^2 (watts per square-meter). The legend is shown on the right side of the screen under Tools and Services.

– As a general rule, GHI above 167 W/m^2 is suitable for solar cooking. However, recall that the 3TIER map depicts annual average GHI. Values are likely to be lower during the winter and higher during the summer. A limited number of maps do depict monthly radiation, e.g., Solar Map from HelioClim3v4-MC for 2005. These tend to be from specific years and locations. One way to locate these maps is to enter 'monthly' in the filter results box on the homepage, and then click Search.

• A more precise value of GHI for any given location can be found on the 3TIER map by clicking on the map, which will cause a pop-up box to appear. Selecting the arrow on the 3TIER Global Solar Dataset box will provide a GHI value for that location, called GRAY_INDEX.
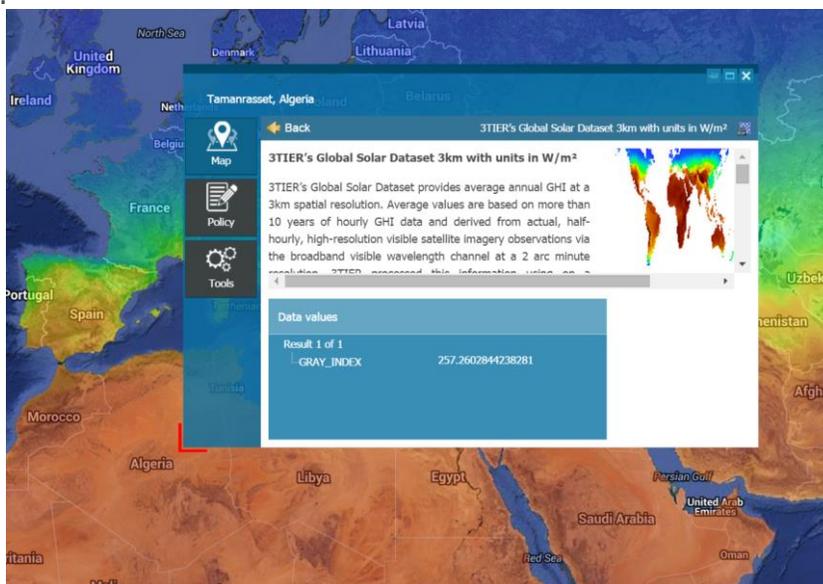
• Use the arrows and the + and – icons, or use the mouse to navigate around the map and to zoom in and out. The scale can also be changed using the drop-down list in the lower-right corner of the map.

• Additional layers can be added to the map, e.g. World country borders, by selecting them from the list on the left side of the map. The layers can also be rearranged by selecting and dragging to the required location in the stack.

• To save your map, select the disk icon above the stack of map layers.

• Legal information about use, access, sharing, and printing of maps can be found at the top of the page under Terms of Use.