Commonly used terms:

Renewable energy:

Renewable energy is energy derived from naturally replenishing sources that can be continuously used without depletion. The "renewable" part refers to the natural processes that replenish these resources, ensuring they remain available for use over long periods, like solar and wind.

Here's a more detailed breakdown:

- **Definition:**

Renewable energy is energy sourced from natural resources that are replenished or renewed over a period of time, making them virtually inexhaustible on a human timescale.

- **Renewable Resources:**

These include sunlight, wind, water, geothermal heat, and biomass (organic matter).

- **Key Characteristic:**

Renewable resources can continue to exist despite being consumed or can replenish themselves over time even as they are used.

- **Examples:**
    - **Solar:** The sun's energy is constantly replenished, making it a renewable source.
    - **Wind:** Wind is a natural phenomenon that is continuously replenished by weather patterns, according to the NRDC.
    - **Water:** The water cycle continuously replenishes water resources, making hydropower a renewable source.
    - **Geothermal:** Heat from the earth's interior is constantly replenished by radioactive decay and convection, according to the U.S. Energy Information Administration (EIA).
    - **Biomass:** While biomass can be replenished through natural processes, the rate of replenishment depends on the specific biomass source and its management practices.

Biomass:

Biomass encompasses a wide variety of organic materials derived from living organisms or their recent remains. These include wood, agricultural residues, animal waste, and municipal solid waste. Additionally, specific energy crops and algae can also be considered forms of biomass. Biomass can also be classified into natural, residual, and biofuel categories.

Here's a more detailed breakdown of biomass forms:

1. Natural Biomass:

- Produced in nature without human intervention.
- Includes:
    - Wood (logs, chips, bark, sawdust).
    - Agricultural crops (corn, soybeans, sugar cane, switchgrass).
    - Algae and aquatic bacteria.

2. Residual Biomass:

- Organic waste produced by human activity.
- Includes:
  - Animal waste (manure, sewage sludge).
  - Municipal solid waste (food waste, yard waste, industrial waste).
  - Agricultural residues (crop stalks, straw, husks).
  - Wood waste (sawmill dust, lumber scraps).

3. Biofuels:

- Obtained from agricultural food crops, crop residues, food industries, urban waste, and non-food agroforestry crops.
- Includes:
  - Biogas (produced from anaerobic digestion of biomass).
  - Alcohol fuels (ethanol, biodiesel).
  - Biomass liquefaction (conversion of biomass to liquid fuels).

BTU (British Thermal Unit)

A British Thermal Unit (BTU) is a unit of measurement for heat energy, specifically the amount of energy needed to raise the temperature of one pound of water by one degree Fahrenheit. In essence, it quantifies the capacity of a system, like a furnace or air conditioner, to add or remove heat from a space. One BTU is also approximately equal to the amount of heat released by burning a match.

Here's a more detailed breakdown:

- **Definition:**

A BTU is the amount of energy required to raise the temperature of one pound of water by one degree Fahrenheit.

- **HVAC:**

In the context of HVAC (heating, ventilation, and air conditioning) systems, BTU ratings indicate the capacity of a system to produce or remove heat. A higher BTU rating means a more powerful system.

- **Example:**

A furnace with a BTU rating of 5,000 can produce 5,000 BTUs of energy over an hour.

- **Tons:**

In air conditioning, BTU ratings are often related to "tons" (e.g., 12,000 BTUs = 1 ton).

Megawatt (MW):

A megawatt (MW) is a unit of power that equates to one million watts. When a power source is rated as one megawatt, it means it has the capacity to deliver energy at a rate of one million joules per second. Regardless of whether they are coal-fired or hydroelectric dams producing electricity, a power plant typically uses MW as their primary measurement of output capacity.

What is the difference between a megawatt and a megawatt hour?
A megawatt measures the power capacity of an electrical system, providing an indication of how much electricity can be produced at any given moment. On the other hand, a megawatt hour represents how much electricity that system delivers over a period of one hour. For example, if a 1 MW solar array runs continuously at capacity for one full hour, **it theoretically produces 1 MWh of electricity**.

To help visualize this concept further, imagine your solar energy system as a water pipe. The megawatts would represent the size or diameter of that pipe, and this would indicate its capability to deliver water. In contrast, the MWh would be equivalent to the actual volume of water flowing through that pipe over an hour.

How many solar panels do you need to reach 1 MW capacity?
The number of solar panels needed to reach one megawatt of installed capacity depends on their wattage, efficiency, and the amount of sunlight available in their location. An average solar panel has a **capacity of around 440 watts**, and one megawatt is equivalent to one million watts. This means that approximately 2,200 solar panels would be needed for the capacity of one full megawatt.

The type of panel matters as well. Monocrystalline panels are often more efficient than others at converting sunlight into electricity. This means that if you were using solar panels that were not very efficient, you might require more than 2,200 of them to have the capacity of one megawatt, even if they all had 440-watt capacity or more.

Having said this, if all the panels had a 440-watt capacity, they wouldn't get close to generating one megawatt hour consistently as panels rarely operate to their full capacity.

What can one megawatt-hour power?
A single megawatt-hour is a substantial amount of energy. To give you an idea of exactly how much, it is enough to keep two refrigerators or two 60-watt light bulbs running for an entire year.
One megawatt-hour is enough to drive an electric vehicle **3,600 miles**. To put that into perspective, that is the equivalent of driving from New York City to Los Angeles and still having plenty of battery power left over.

To further illustrate, one megawatt of power is enough to power the average household in America home for 1.2 months, run a swimming pool pump for five continuous months, or even toast almost 90,000 slices of bread.

How many homes can 1 megawatt-hour power?
If we consider the average US home with its typical electrical energy consumption rates, **approximately 750 to 1,000 individual houses** could be powered by just one megawatt for a one-hour period.