DEFINITION

clean electricity

By

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1. Clean electricity is electrical power that is free from voltage spikes and drops. Voltage ripple or noise that is outside the ideal sine waveform is sometimes referred to as dirty electricity or electrical pollution.

Dirty electricity can cause electronics to perform poorly, especially microelectronics. High voltage spikes, for example, can cause electronic component damage, both immediate and long-term, computer memory loss, program corruption and operating errors. Because electrical pollution can damage equipment and decrease the lifespan of hardware, it is a particular cause of concern for data center administrators.

The quality of electricity is influenced by everything up to and in between the electricity provider and the electronic equipment in question. An uninterruptable power supply (UPS) can help protect electronics when local power is dirty.

2. In a slightly different context, clean electricity, also known as green electricity or green energy, is electrical power produced by methods that use renewable energy resources and do not cause pollution. Clean electricity generation methods include photovoltaic solar, geothermal, wind, tidal, rain and waste heat recovery technologies.

What Is Dirty Power?

Dirty power is an umbrella term for a wide range of abnormalities in the electricity that runs your facility. This wide range of power problems is also caused by an equally diverse range of power issues. Regardless, the power issues and problems are disruptive, inconvenient, and costly.

On the other hand, there is clean power. Clean power is any electrical power that is free from spikes and voltage drops, known as voltage ripple. In a slightly varying context, clean power, also known as green energy or green electricity, is electrical power produced by methods that utilize renewable energy sources and don’t cause pollution.

Clean Power VS Dirty Power

Clean power is electricity coming through an electric outlet with little to no electrical noise. “Electrical noise” does not necessarily mean audible noise, though it can be present in some circumstances. Ideally, it refers to electromagnetic frequencies lying outside the desired range expected from any power source.

On the other hand, dirty power has electromagnetic noise that causes interference with your power supply. Such noises originate from external sources like power lines or originated from inside your property.

The dirty power abnormalities include and are characterized by:

- Frequency variations
- Low power factor
- Surges
- **Voltage** variations
- Flickering and blinking lights
- **Transformer** issues
- Poor network communication
- Printed circuit board failures
- Premature motor failure;
- Among others.

Dirty power typically originated within and outside your property. Natural occurrences such as lighting and non-natural sources like utility switching can affect power quality even before reaching your property.

Additionally, daily internal electrical equipment fluctuations may cause cumulative and potentially fatal power hazards. However, most people generally tend to overlook or downplay minor dirty power issues such as flickering lights. Unfortunately, if left unchecked, minor dirty power issues can lead to even more troublesome power failures.

Fortunately, the majority of power issues happen to the user side of an electric meter, meaning you can take the appropriate corrective steps. Taking such steps will help you avoid costly power disruptions, improve energy efficiency, and generally reduce costs.

Your first step in the approach should be to determine what caused the dirty power situation.

What Causes Dirty Power?

Dirty voltage is mostly caused when electrical devices—like **smart meters** —linked to a circuit manipulate the current in any way, for example, changing AC to DC power. Such

causes a spike and surges of higher frequencies that radiate out of the wiring and into your property.
Below are some common dirty power disturbances and their causes:

- Normal mode noises—which are low-level signals. The common causes include power line modulation equipment, switching power supplies, and computers
- Normal mode impulses and ringing transients—which is a narrow, fast-rise voltage variation. The causes include utility switching, switching loads on or off, and lightning
- Common mode disturbances—which are EMI/RFI noises and impulses superimposed on the power conductors. They are typically caused by computers, radios, lightning, and arching contacts.
- Sags. This is a low-voltage condition on or more phases. Causes include lightning, low power system capacity, starting large loads, and ground faults.
- Over voltages caused by rapid load reduction and utility switching
- Outage. This is a zero-volt condition caused by lightning, acts of nature, accidents, and ground faults equipment failure.

Check with your local electrician for a precise diagnosis of the causes of dirty voltage in your property.

How to Solve Dirty Power

In most cases, dirty power is inevitable. Fortunately, with a little knowledge and expertise, it becomes a reversible situation. Below are expert-recommended ways to solve dirty power:

1. Measure your dirty power. Get a qualified electrician who will assess the damage level using a dirty power meter. The solutions you will take depend on the results of the assessment. If it is a minor dirty power issue, you might simply need to install dirty voltage filters to minimize the noise.
2. Choose your electrical devices and appliances wisely. Consider appliances and devices that have a smooth use of electricity before making purchases. Also, cut down on your use of devices that are known to dirty the power.
3. Consider switching from Compact Fluorescent Light (CFL) bulbs to incandescent or LED bulbs. CFL bulbs are known to create dirty power.
4. Consider replacing your SMART meter with an analog meter. Unfortunately, SMART meters can be major sources of dirty power.
5. Turn of appliances and devices that you are not using.

How Do You Test for Dirty Power?

Some of the methods you can test your dirty water include:

Graham-Stetzer Meter

It is a common device (meter) that measures the harmonics or dirty electricity on your property's electrical wiring. The Graham-Stetzer meter measures this using its independent Graham Stetzer (GS) units. The meter states that the readings are ideally under 50 GS units, which is quite rare.

Most homes with readings below 200 GS are considered safe. However, if your reading is past 200 GS or has maxed out the meter at 2,000GS units, you will need immediate power filtering. The meter picks up frequencies ranging from 10KHz to 100KHz.

AM Radio

An AM radio is a basic and effective, simple EMI detector. Turn the AM dial all the way to the left (500KHz) and right (2MHz). The radio will show a difference in static depending on changes in the electromagnetic environment. Such is a good method for detecting dirty power at home.

Conclusion

Dirty voltage is often an inevitable occurrence that affects your property's electricity. From the simple dirty power definition, it is a nuisance that can quickly escalate into potential damages and costs. Unlike clean power, dirty power is characterized by electromagnetic noises that cause interference with your property's **power supply**. Fortunately, dirty power can be fixed with a little electrical knowledge and expertise. A Graham-Stetzer is an ideal method to test your dirty power before taking any actions and solutions.