**How Electricity Reaches our Homes?**

We all depend on electricity in our daily lives to keep going, whether it’s turning on our computers for work, watching television, grabbing a sandwich from the refrigerator, [using an ATM](cardzgroup.com), or charging our cell phones. It all seems very simple and easy. But have we ever thought about what makes up electricity and where does it come from?

Let’s have a look at how and where electricity is generated, and what path it takes to reach our homes and offices.

**Power Grid Station**

It starts life in a grid station, which is a huge plant located mostly near energy producing sources such as hydroelectricity dams, wind or solar farms and natural gas plants. Power plants use fuel as sources of energy from wind, coal, sun or even nuclear energy and convert this energy into electricity using equipment including boiler, furnace, turbine, cooling tower and generators. This electricity is then converted into high voltage and transferred to large substations with the help of overhead lines. This voltage can be as high as 25000 Volts or more.

**Substation**

Substations are an important part of the electricity transmission. Usually located near power grid stations, they increase the current voltage even further, thus allowing it to be transmitted to longer distances while retaining power. This is done with the help of transformers which can both increase or decrease the electric current voltage. Voltage decrease is required during distribution to make it safe and less powerful before electricity enters households.

When electricity passes through the first substation transformer, it next goes to transmission network.

**Transmission Network**

A transmission network helps move electricity from power substations to a distribution network. It facilitates delivery of electricity to end users such as houses, offices and commercial areas. The voltage is still very high at this stage because electricity has to cover long distances before it reaches the end user.

Transmission network is made of overhead lines on metal pylon, or, lines buried underground. These lines are insulated to keep them safe from giving electric shock in case they come in contact with a human, since they carry ultra-high voltages.

**Second Substation Transformer**

Again, with the help of transformer, electricity voltage is reduced to ensure safe reach and usage by households. At this stage, electricity leaves the transmission network and reaches the distribution network.

Depending upon the location and usage, substation type and voltage can differ. For instance, industrial areas may require the voltage to be reduced to around 33,000 volts whereas urban areas with small factories may require voltage between 11,000 to 33,000 volts. Transformers distributing electricity to houses and buildings on the other hand will deliver voltage as low as 230 volts.

**Distribution Network**

From substation transformer, the electricity enters the distribution network lines to reach its final destination. These power lines could be underground or overhead in different areas. Once it reaches a neighborhood, it passes through another small street transformer to further reduce the voltage – thus ensuring its safety of use.

**Finally – the Home**

As a last step, it passes through service drop and your meter records the electricity used by you. It gets divided into circuits for all areas of the house at the switchboard, and finally transmits through the wires inside your walls to power switches. Here is where you conveniently operate all your electrical appliances and lights.

**Challenges faced by Power Grid Stations**

The power grids are important for energy generation to ensure a safe balance of supply and demand of electricity. But in locations where transmission and distribution networks have already served their useful life, they need to be renewed or replaced. This requirement is important to maintain the reliability and continuity of electrical system and also to create link with renewable energy sources as they become increasingly popular.

Also, considering the lengthy process it takes for electricity to reach our homes from start till end, it is important that we use it carefully and do not take it for granted when we next turn on the television or switch on our room lights.