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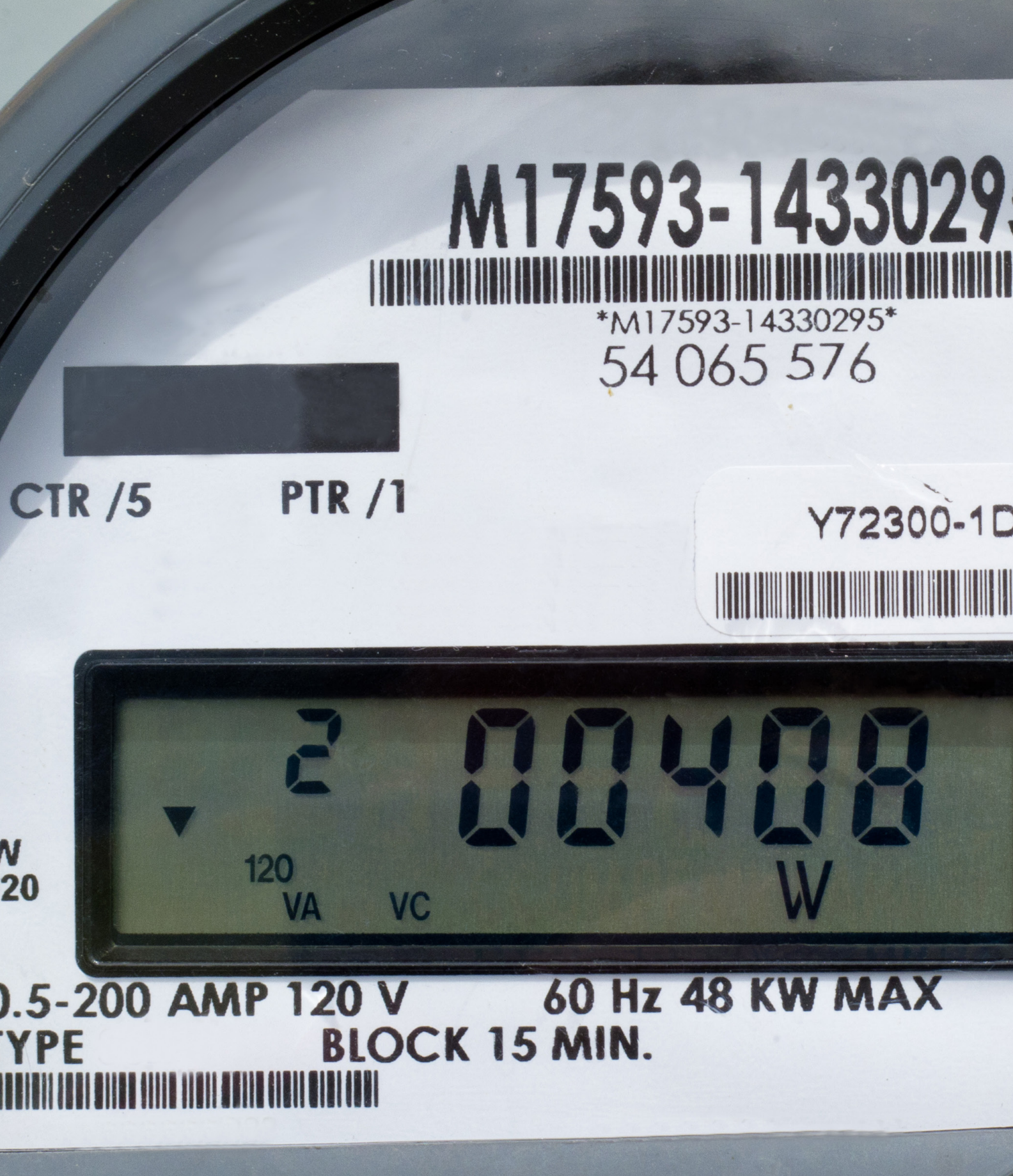
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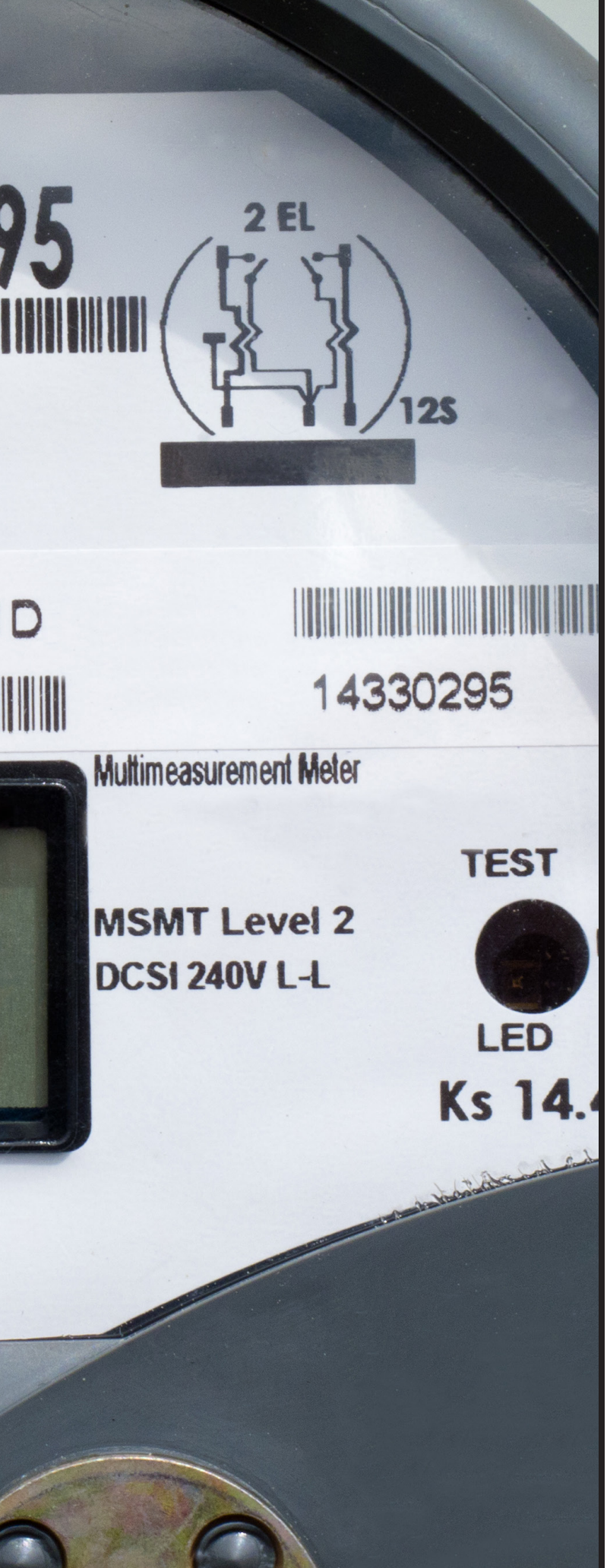
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# How Beneficial Residential Smart Meters Really Are

By Xander Palmer

There is a lot of buzz about smart meters in the air. What exactly are smart meters all about? They are a meter to measure your utility consumption. Unlike the non -smart one that you have got, it is programmable and the utility companies can instruct it to send the information of your consumption daily or even hourly. This provision of automatic 2 way communication between one and the central system for exchange of information and instructions is called Telemetering.

The importance of taking meter readings is not trivial. Non-smart ones must be read on a regular basis. At the ground level, there usually there are not enough resources for them to be read frequently. Consider a billing cycle. There are hundreds of consumers and a few meter operators who go to check these non-smart meters. There is many times that the meter operators are not able to do a routine check on all the conventional meters in accordance with the billing cycle and some meter readings are not provided to the meter operators. If the customers do not call the consumer services and inform them of the meter readings, then many a times the bills are estimated. This situation is evident mostly in the first summer bill. If the non-smart meters' reading has not been provided, then the bills will consider the winter consumption of gas and electricity as the average consumption and the estimations considered accordingly. Such bills can be 'rude shocks' (as some customers insist). Such issues require regular non-smart meters' reads and accordingly meter reading appointments are booked. While the procedure gets rolling, the customers' billing report gets sent to credit agencies and the utility company also suffers losses due to delayed payments and the subsequent procedures to procure the bill amount.

Also if a utility company would want to know about the peak times of consumption of an area or household on a daily or bi-weekly basis, there is no way to ascertain it accurately.But all of these hassles can be eliminated by the installation of smart meters. They automatically send updates and meter reads to the utility companies on a regular basis. If it is required, then they can send update every hour also. This helps any utility provider to assess peak consumption hours during the day and be prepared to provide gas or electricity in the region accordingly. This information helps them manage the regulation of resources better and therefore not only the efficiency increases, but also there is a better supply to all the customers.

If there is a disruption in the supply at a property, then the first thing that they do is to send a signal to the utility provider, and gets them ready for the situation and also

helps in a pre-emptive prevention measure be put into place. This helps in an enhanced customer experience.

Likewise the collation of data to establish whether there is an outage in the region can be quickly established by smart meters without actually visiting the area. These benefits of smart meters far outweigh their cons, if any.

*Reasons Why Smart Meters Are Beneficial To Utility Companies*

Let us try and understand how the smart meters benefit the customers and utility companies alike. First of all, let us view the usage of smart meters as an alternative to the conventional digital meters that are used to measure the consumption of gas, water and electricity. They are meters which send the consumption information to the utility companies on a regular basis. They eliminate the need of the meter be read manually for billing purposes.

Smart meters are read only under exceptional circumstances when it is assumed that they are not functioning properly. They have been designed to communicate with their hosts automatically, hosts being the service and utility providers in this case. These smart meters help a utility company reduce any issues related to the consumption. Manual reading of non-smart meters has been prevalent but is a time consuming process. Manual resources used for this purpose can be employed in maintenance and other sectors, which also help a utility company to save on time and increase efficiency.

There are many fault elements that are probable in manual reading, especially in case the meter reads are not standardized. For example, in the U.K. there are 2 types of non-smart meters. There are the single read meters for gas and electricity and there are also dual rate meters which provide the consumption information separately for day and night. These are called dual rate meters and have 2 tiers of calculations, one tier more economical than the others. At times it is difficult to read these meters if one is not acquainted with the concept. There are other times when digits can be misread.

The smart meters take care of all such information and remove the possibility of any errors. These meters regularly send information to the utility providers and many a times as frequently as every hour. Many in the same area can be programmed to do so and this kind of data collection is not possible manually at the same time without the use of a singularly large workforce. This regular supply of information helps a utility company keep a check on the consumption trends of a customer or an area and helps it better channel resources in that region. Any outage in the area gets immediately reported with them alerting the utility services as soon as the supply is withdrawn.

They can be installed anywhere within or outside the house and the customers do not have to bear the inconvenience to look for the meter readings in case of any questions. The utility companies have better, accurate and more up to date information with them to inform the customers and do any analysis that is required till the same day. The smart meters allow the efficiency to increase many fold.

They just need to call the utility company and put forth their queries. Smart meters in this manner help provide a good experience to the customers. The utility companies can keep a check on the customers using these smart meters only.

*The Technology Behind Dual Fuel Smart Meters*

The smart meters are being said to bring about the next revolution in the utility supply scene. They are often referred to as electrical meters in some parts of the globe and are digital smart meters which have been created for remote access and exchange information.

They usually comprise of real time sensor technology that evokes responses in them. They are called smart meters because at any point in time, if there is a power outage or deteriorating quality of electricity or gas that is being supplied to the property, they are able to detect the change and relay the information to the service providers for them to get it logged and in response a solution be designed and implemented to do away with the issue.

There is another provision in their which is referred to as Automated Meter Reading. This is the technology which assists in the automatic consumption, diagnostic and status data to be automatically collected and transferred to a centralized database for billing purposes. This is the data regarding the consumption of gas, electricity and water. This is the feature that allows them to take and store the meter readings at designated regular intervals. This eliminates the need for manual reading of the non-smart ones. Also all this information sought by them are used in different kinds of analysis by the utility companies. This technology for them is based on radio frequency as well as power line transmission, whichever convenient.

As a part of Advance Metering Infrastructure, they include features that help in collation of data that can be used to ascertain many details with regards to the energy consumption. The data gathered by the smart meters is used to analyze and measure the energy usage. This measurement also helps the utility companies assess how to control production and supply and in course increase efficiency in ensuring supply. This system allows interaction between smart meters installed for gas, electricity, heat and water. This communication from smart meters can be prompted as a response to a request or in accordance with a predefined schedule.

The resources used in the advance metering infrastructure include software, hardware, energy display and controllers, systems associated with customers, communication systems, Meter Data Management Software, network distribution business systems, Meter Data Management Softwares etc. This technology is based on the amalgamation of all these systems to create a unique domain design where at the prompt of a button the information regarding the customer till that day is made available accurately. The smart meters are the end result of this technology collaboration.

The necessity to create the smart meters system has arisen out of the need to increase efficiency and regulate energy supply effectively to control the spiraling and fluctuating costs.

The objective of the process is to be able to gather real time information from the smart meters and analyze it to assess the consumption trends. These trends can be detailed right down to the peak usage daily and therefore allow the utility companies to predict a need and a shortfall in a particular area and

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the smart meters are the key to data collation and transfer.

*Reasons Why Smart Meters Reduce Billing Issues*

Smart meters help reduce any billing issues and can also help in keeping your credit ratings good. This statement is not debatable. The benefits of them have been identified as huge and this is why the United Kingdom government has vouched to have smart meters installed in all the homes by 2020!

How do they help in reducing the issues related to the bills? Consider the situation where you have normal electricity or gas non-smart meters installed. Assume that you have a quarterly billing facility available. This means that your bill gets generated every three months. You expect that a meter operator would come around to read the meter which is installed outside the property. But if you have talked to your utility service provider earlier about this, you will be surprised to know that most of the times the meter operators do not visit the property and taking the non-smart meters' reading as a routine is more a responsibility of the consumer.

Many times the consumers forget or are unaware of the fact that they have to provide the non-smart meters' readings for an accurate bill. Once every three months, if the bill is assessed due to estimation for the lack of an actual meter reading, then the bill amount might differ vastly than the customer would have expected. This would lead to billing disputes and in cases where the customer is not able to reach the non-smart meters' location, take a lot of time to resolve.

This issue can be effectively be resolved by the installation of smart meters at the property. They automatically send the reading to the supplier and the customer always invariably receives the correct bill every time. There are many utility companies which are linked with credit agencies. This means that if a utility bill is not paid in time, then the customer's credit scores get affected. This happens a lot of times when there is a billing dispute regarding the meter reads. With them eliminating the meter reading issue, the customers will pay in time and hence their credit ratings will stand good.

Consider the other situation where a consumer has just paid a winter bill and the next summer bill is estimated on the winter consumption. More often than not, the customers blame the utility companies for incompetence for not having read the non-smart meters properly. This is also one of the major causes of the customers changing utility brands. Late final payments in these cases have been a major source of credit scores being affected adversely. They help eliminate that problem as well. With the last day of supply being made available, the bill can be assessed accurately for that date and even though the customer might have left the property earlier, the final bill is generated spot on.

The smart meters therefore eliminate bill and meter reading related issues and therefore customers are persuaded to pay their bills in time. This is a positive both for the customers and the utility companies as the revenue inflow becomes more efficient and on the other hand, the smart meters indirectly help maintain the customer's credit scores.



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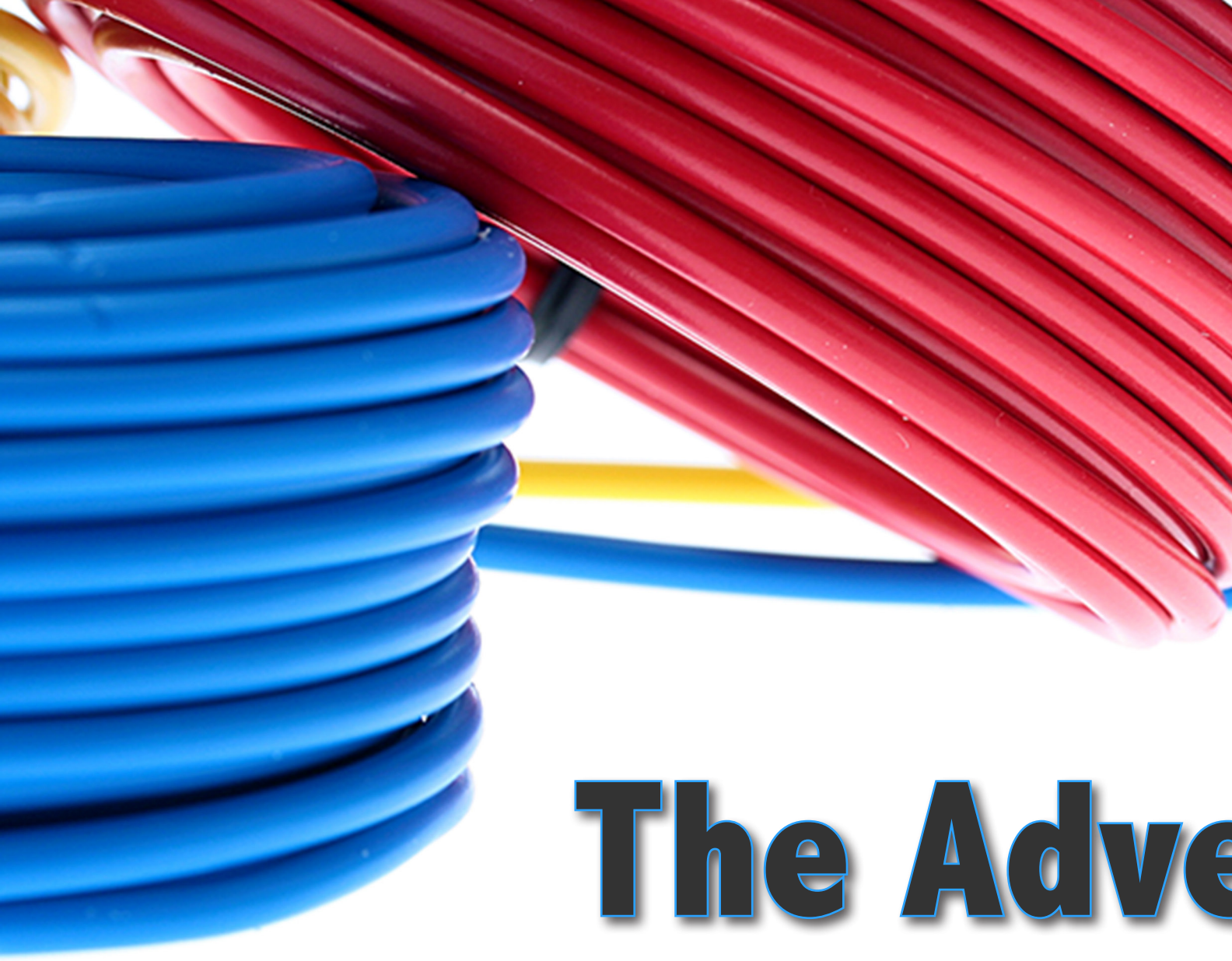
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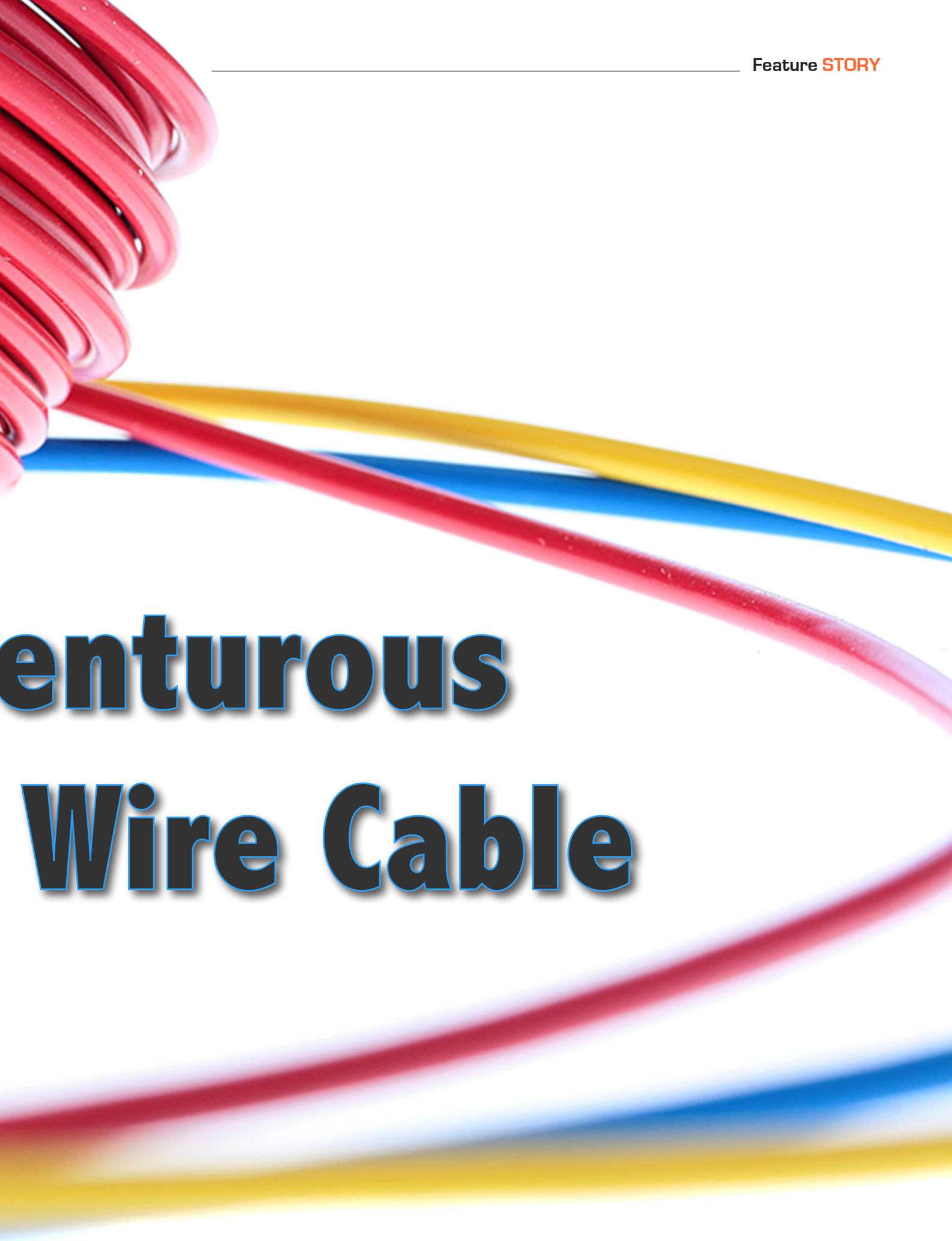
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# The Adve

# History of



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# Wire Cable

*By Michael Atma*

If you look back a couple of hundred years to the beginnings of wire cable you'll be able to look at the very colorful history of how it began from its humble beginnings as a telegraph cable in 1795 to the miracles of modern technology today. But first of all, let's look at where it all began and what sort of companies have supported its growth.

There is a perception that companies either developed the technology themselves, or improved on what was already there. Most individuals, however are astonished to find out that wire-cable's humble beginnings took place as early as the eighteenth century - and even though it was experimental and not readily accessible, scientists were still using it to transmit signals with varying distance success. So what were the defining moments in the history of wire cable? The following is a brief summary of the most notable:

=> 1795 (Don Francisco Salva) - first recorded account of the use of paper as an insulating material - Salva wrapped each wire in paper, coated it with pitch, tied them all together then wrapped the whole cable in more paper to prevent the lateral escape of electricity. The result was the laying of a 26-mile long telegraph cable between Madrid and Aranjuez which actually transmitted signals.

=> 1809 (S.T. Von Sommering) - Sommering was able to transmit signals and messages through a length of one thousand fee of multi core cable - he did this by initially coating each copper wire with gum lac and covering it with a silk-thread, then he bunched the wires together and yet again coated those wires with more gum lac. This system was used to eventually transmit messages up to 10,000 ft between transmitter and receiver.

=> 1832 (Baron Von Schilling's electromagnetic telegraph) - toured the Far East and the Continent for several years from 1832 using a model of the telegraph to demonstrate its capabilities. In 1836, the Russian Emperor Nicholas, comprehending the more practical applications of the telegraph, approved and appointed the commissioning of a line between St Petersberg and Peteroff. It was part submarine cable laid along the bottom of a canal and part above ground with the wires suspended from posts. It was so successful that the Russians planned to lay the first submarine cable along the Gulf of Finland (unfortunately Von Schilling died in 1837 so this didn't occur).

=> 1837 (Cooke and Wheatstone) - received the first patent for the development of insulated wires and cables - Illustrated the process (or system) by digging a trench 2 miles long and burying the cable-wire in it. The copper wires were laid in long wooden baulks painted with a preservative tar compound and buried in the trench, which was then filled with pitch. Wheatstone, stationed at Euston, sent a message to Cooke at Camden Town, and was ecstatic when he received an immediate reply.

This was the Age of Invention, and many more exciting developments followed. The work of these tenacious and dedicated engineers and scientists laid the groundwork for the wire cable we use today, and for the success of many who help us apply the benefits of the technology, unheralded and mostly unappreciated.

The late 1830's saw the introduction of a new natural material that proved to be an ideal solution to making wire cable waterproof - "gutta percha," a natural polymer made from the milky sap of the gutta percha tree, a native of the Pacific Rim countries.

Gutta percha solved the problem of moisture getting into the land-laid wire cables. Samples were sent to Germany by Carl Siemens to his brother William, who suggested to the Prussian Telegraph Commission that experiments be conducted to assess its qualities. As a result, the first underground telegraph cable was laid between Berlin and Gross Beren in 1848.

In 1850 the Brett Brothers gained a contract to lay a cable across the English Channel and on 28 August the cable, weighed down with lead weights, was dropped over the back of a steam tug, starting from Dover and coming ashore on the French coast later that day. A signal was sent immediately, and received, but the message was gibberish, due to what we now know as induction. Unable to remedy the situation, both sides left for the evening, only to find when they came back that next day that the line was dead. Apparently, a French fisherman brought the cable up in his nets, and thinking it valuable, cut it in half and hauled as much of it into his boat as he could.

A much more heavily constructed cable was laid the following year which was successful and was followed by:

> Dover to Ostend - 1853 (England to Europe).

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> England to Ireland across the Irish Sea - 1853.

> Holyhead and Howth (England to Ireland) - 1854.

> Black Sea to the Crimea - "The Black Sea Cable" - three hundred nautical miles - providing quick communication between British forces in the Crimea and England.

Cables across the Atlantic -

Following the success of the submarine cables over these distances, the Americans became interested in the prospect of joining the Old and New Worlds by submarine wire cable. Funds were raised for this ambitious scheme and two British companies were each contracted to supply 1250 nautical miles of wire cable which took six months to manufacture.

The 1857 expedition was abandoned when the cable became entangled in machinery and snapped. It was recovered, and in 1858 work resumed, but this time, the two ships would approach each other from opposite sides of the Atlantic and meet in the middle. The worst Atlantic storm in many years almost sunk one of the ships, but the rendezvous was finally reached. However, the operation didn't so smoothly, and several attempts had to be made to splice broken cable. With the wire cable finally joined, the first signal was made on 6 August 1858.

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# Understanding an Underground Electrical Cable and Power Cables

By Chris G Bell

Quality and safety should be the basis in choosing an underground electrical cable. This is to ensure that the product will perform to its fullest while giving an assurance that it can offer enough protection to people.

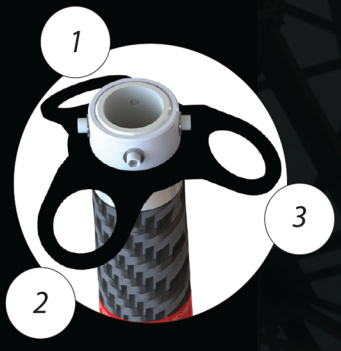
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• Tray Cable. This product was made to stand against many condition including extreme heat and direct sunlight exposure. It can also withstand weathering and humidity which is the reason behind the formation of moisture. When no proper protections are given, these conditions can weaken or destroy the capacity of electrical cables. Moreover, it can also be hazardous to people's health. Worse, it can lead to death.

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Tray cable is the stiff copper wire. Copper wire has been noted for its underground purposes. In addition, it is non-expandable and non-elastic as well. These properties are the reason why stiff Copper wire can be easily installed and used.

What's more, stiff copper wire is an ideal choice for power signal transmission since it can minimize the effect of interference. That is why you can find Copper wire when connecting wire ways, channels, trays, furrows, gutters, trenches, tracks and conduits. However, the used of Tray cable is not limited to underground uses. It can also be used for area with poor ventilation. So it can also be used for ladder type cable trays and for raceways. It can be used underground yet it can also be utilized for environments that do not have covers, ranging from very dry to damp or moist.

The product is available in two, three, four and five conductor cables. These are all color coded for easy recognition. However, the five conductor cables are coded in a different way as it uses the alphanumeric method of coding.

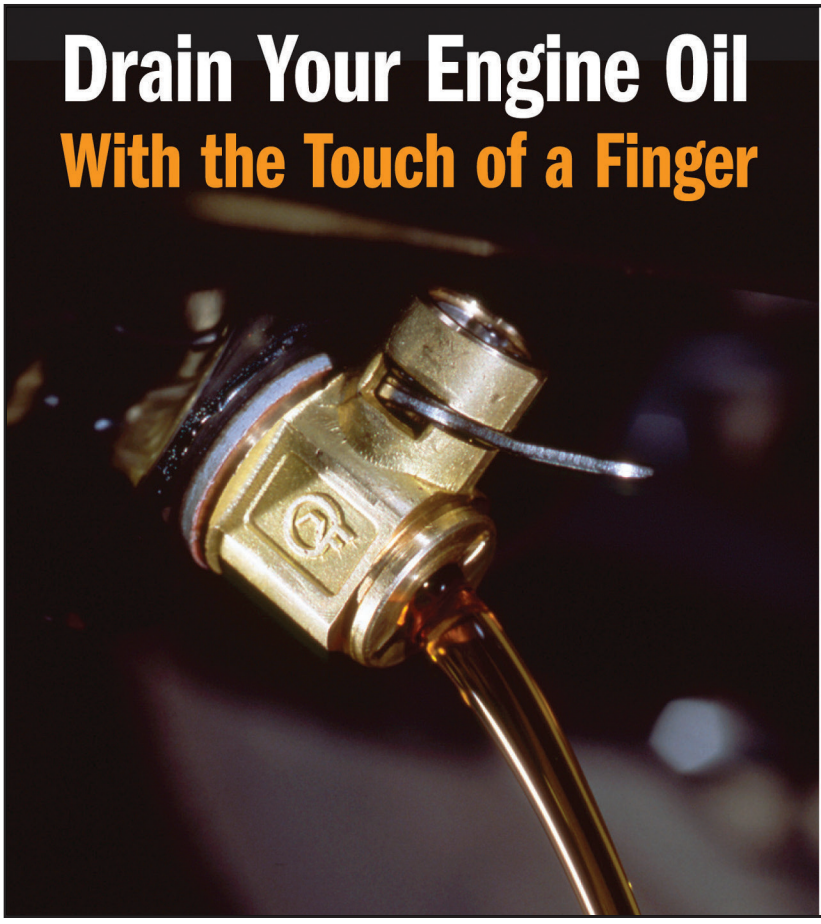
• UFB cable is an underground cable used directly in the ground without conduit. Sometimes underground electrical wire is used in conduit too, which can protect the cable for a longer period of time, but it's definitely not needed. UFB cable has the tough outer jacket to withstand the underground abuse.

Underground UF-B cable has a proven track record when it comes to quality. This is due to the fact that the manufactures made it certain that the product passed the standards set by different agencies including the National Electrical Code. Moreover, they have many versions available to consumers. The products are made with 2 to 3 conductors. These conductors are also made from Copper wires.

Moreover, it is available in 6, 8, 10, 12, and 14 awg. Underground UF-B cables are also made to stand extreme weather conditions. You can also save up on insulators as these products are insulated. This is to offer protection to people.

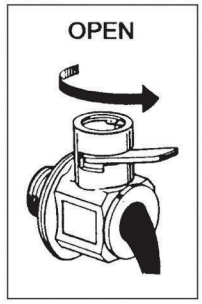
In conclusion, whether you choose tray cable or the underground UF-B cable for an underground electrical cable, you are assured that is made from the finest materials. There is also an additional protection such as insulation which is provided by the manufacturers.

WesBell Electronics Inc stocks underground electrical cables and many other types of outdoor and underground power cables. Our UF-B Cablecan be used as a direct burial cable without conduit where as MC Cable can only be used outdoors and in conduit.







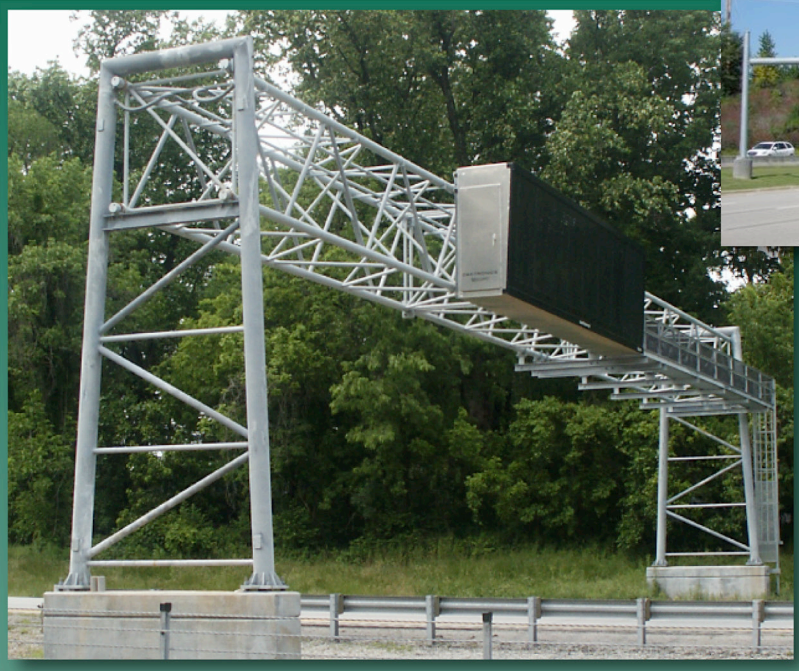

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# Introduction to Advanced Meter Infrastructure

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*By Ryan R Rudman*

Advanced Metering Infrastructure (AMI) presents itself as an alternative metering methodology. The original intent behind the methodology was to enable Automated Meter Reading (AMR). As a result both these terms have become common within the industry, a point which leads to much confusion.

Historically speaking AMR is the predecessor of AMI. In other words the methodology and technologies used in AMI were born out of the methodology and technologies of AMR. For purposes of our discussion we will therefore focus on AMI. However, one needs to have some insight into both methodologies in order to have a complete picture of AMI. The basis for both methodologies is founded in the principle that using specialized devices and communications methods it is possible to collect data from metering equipment without having to physically read or interact with the metering device.

Generally speaking, AMR refers to the ability to collect data from electricity, gas and/or water meters remotely and automatically via several different communications networks, including RF wireless, power line carrier, telephone, and other ways. The term AMI extends our understanding of AMR to refer to a system that is capable of collecting detailed energy usage data more frequently. It also implies that there is a bi-directional communication channel between the meter management system and the devices. Having a bidirectional communication channel the AMI methodology immediately opens the scope of capabilities since it allows data to be received and transmitted between the metering equipment and the meter management system.

In addition to the networked nature of AMI technology there is another key difference when compared to STS technology. Where communication within the STS methodology is based on Tokens that are entered into a metering device, communication within the AMI methodology is performed in-band to a communication link. The implication of this is that there is no need to enter tokens to AMI metering devices. Instead, information such as how much power you have purchased is automatically communicated to the meter using the in-band communications system.


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Another fundamental difference between STS and AMI is that STS is only intended as a method for prepayment. STS cannot be used to manage post-paid billing. This is very important and you should read this paragraph again, as the implications on sectional title metering can be far reaching once this seemingly small difference is understood. AMI, with roots in AMR, was originally designed to automate the meter reading process and supply this information to a local authority so that they may present a bill to their customer.

It was not designed to manage prepayment billing, it was simply designed to collect data and present it for billing.

For this reason most AMI meters do not have any prepayment features. This is the exact opposite to STS which was designed and still functions ONLY as prepayment system. The logic of prepayment therefore in AMI must be handled in software at the meter management system.

The meter management and vending service offered supports both STS and AMI compatible metering systems. As a result they can offer customers a choice of STS and AMI technologies. As previously mentioned and emphasized, for customers using AMI systems can offer both prepaid and post-paid billing options.

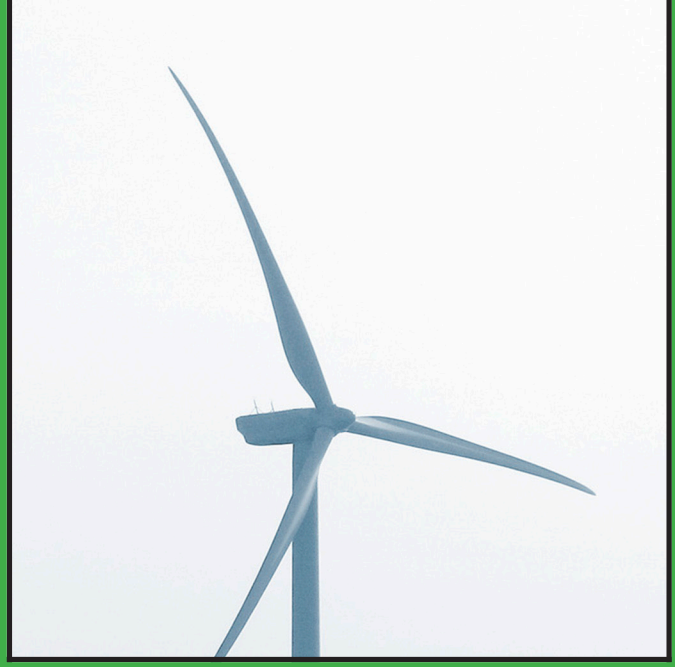
While AMI presents many benefits over STS it is not without drawbacks. The main drawback of AMI is that it cannot be deployed as readily as STS. The reason for this is that a communications network must be established before data can be collected from meters to one or more devices known as Data Collectors.

Then, assuming that the communications network is in place and meters can talk to their Data Collectors, the Data Collector must be able to communicate with the meter management system where decision making can be performed. This is not difficult to achieve, the contrary is quite true. However this does increase the cost of deployment for AMI. It also increases the operational cost as data needs to be communicated to and from the data collection devices and the meter management system. All this communication means is: that there is an operational expense for data costs.

*Ryan R Rudman writes for http://www.PrepaidMeters.co.za. PrepaidMeters.co.za is a leading sub-metering service provides operating in South Africa and internationally.*

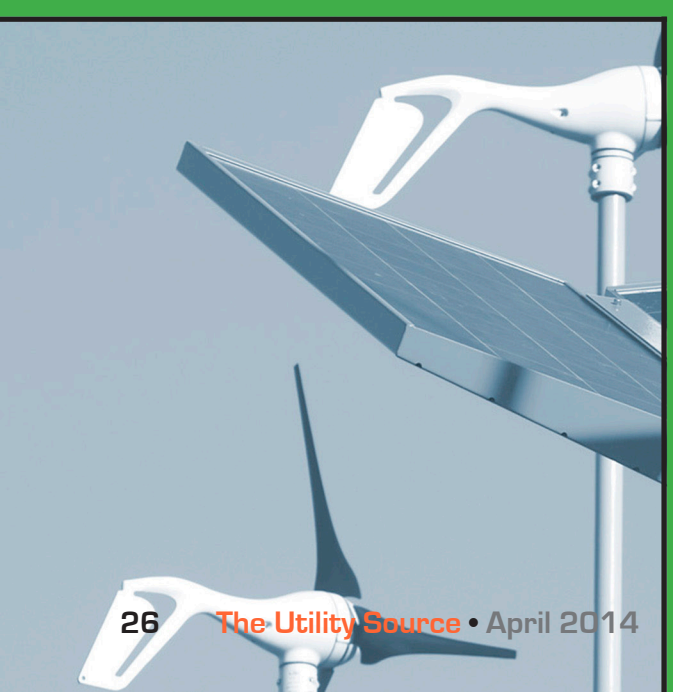






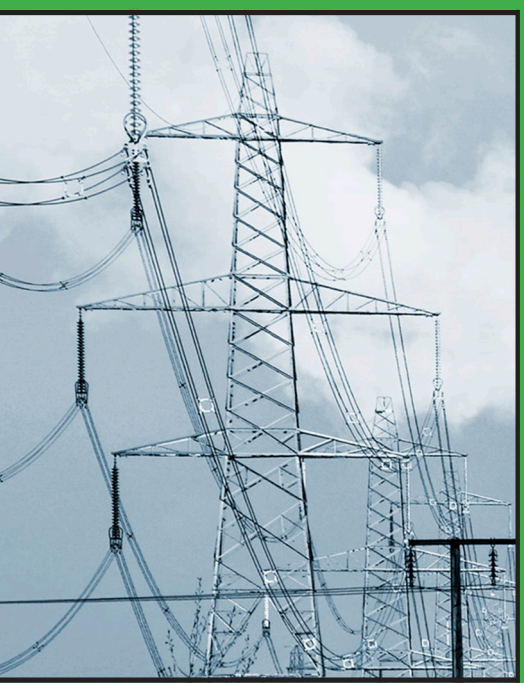
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# Advantages and Disadvantages of Renewable Energy

*By Steve D Evans*

Renewable energy is really the generation of power in useful forms from natural sources such as the sun (solar energy), wind (air currents), water (hydro, waves, currents etc.), biological (biomass) and the earth itself (geothermal). This is an inexhaustible supply and technologies are evolving to make use of these processes for conversion to usable energy.

One advantage unique to renewable energy but not fully appreciated is the phenomenon of community renewable power project. Community renewables projects can be a great force for social cohesion, and they can create a wide range of social benefits that transcend the economics of a particular project. These advantages include decreased dependence on foreign natural gas and oil, a power infrastructure that is far less subject to large-scale disruption or terrorism because of its distributed and diverse nature, local control of generation facilities, creation of much needed high-quality jobs in rural areas, and a supplemental revenue stream for agricultural community members that allows them to maintain their rural lifestyle. These projects include projects as diverse as willow coppicing and gasifying the wood chip produced, using power plants built mostly on farms, to community anaerobic digesters processing the food and organic waste of a community feeding electric power into the local power grid and hot water via CHP schemes into their homes for low cost heating.

Wind power is an example of a power type which can take jobs and revenue to remote communities which have otherwise been declining. A large wind farm can create dozens of secure long term jobs.

The relative price of renewable fuels is now much lower, so the incentives are there to invest. Wind power is a typical example where investors are receiving good yields and are likely to do so for many years to come. The term alternative is used to contrast with fossil fuels according to some sources. Wind turbines can be situated on land or off-shore providing many more sites.

Wind energy is the fastest growing energy resource in the world and can economically produce scalable renewable power to meet growing energy demands. In the US, wind power could produce up to 25% of our nation's energy needs and we think this is a good thing.

Biomass energy comes from plants and trees. Wood is the largest source of biomass energy. However this form of energy can be implemented badly, and if it is it can be inefficient and destructive. One example is if biomass is burnt but the forests are not replanted.

To power a large proportion of the United States by biomass, vast areas would need to be taken from food production and harvested annually to feed our energy cravings while food prices would still rise higher and higher.

Biodiesel use is small now, but its use in diesel engines and for heating is increasing. Biodiesel and bioethanol do produce carbon dioxide when they are combusted in a car engine. However, crops used to make it do re-absorb that carbon dioxide as they grow. This biofuel is competitive with regular diesel fuel within a local market. A market worldwide for this product of methane is developing very quickly. Europe is now the largest biodiesel market in the world.

Biodiesel and ethanol, for example, is being combined with gasoline for cleaner transportation fuel.

While we are on the subject of combining technologies to give useful results. Sunlight is being collected and is being combined with standard electric lighting to produce hybrid solar lighting, a new development in solar technology.

Geothermal Energy can be used much more than it has been to date. Geologically derived energy of this sort is produced by heat from sources below the Earth's surface. For electricity generation, steam created by these underground heat sources is used to spin turbines. Geothermal energy uses hot water deep within the earth's crust to spin turbines and produce power 24 hours a day, seven days a week. It produces few carbon emissions and can re-inject used-water back into the earth to be used again, making it fully sustainable.

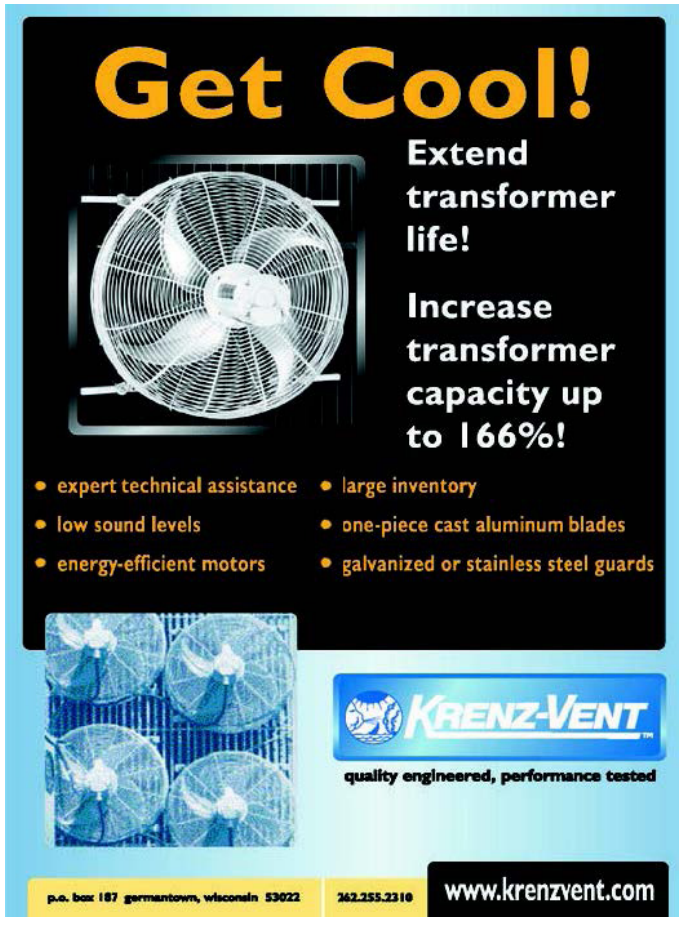
Solar power is generated when utilities are in highest demand - in the middle of the day. In terms of the energy to make these solar cells, it is said that in about the same time it takes to pay them off - four to five years - the cells provide back the energy that was required to make them in the first place.

One place in which solar energy is being heavily used is Hong Kong. Solar energy is abundant in Hong Kong's sunny climate, and easy to use. However, you can consider replacing your existing water heater with a new solar hot water heating system located on the rooftop of your building, even if not in a hot country. The reduction in available solar energy between equator and poles is not a great as most people seem to think. Solar thermal power stations operate in the USA and Spain, and the largest of these is the 354 MW SEGS power plant in the Mojave Desert, but solar is still worthwhile in more temperate climates.

Finally, there is the potential for much more thermal electric energy to be captured, where the sun light is reflected and focused using a huge parabolic mirror. This reflected light energy can then be used to heat water to create steam which can be used to drive a turbine to produce electricity just like in a conventional power plant.

*Steve Evans is a renewables writer and expert. Visit his other web sites. See the biogas digesters* web site to find out much more about this fascinating and rapidly developing subject.






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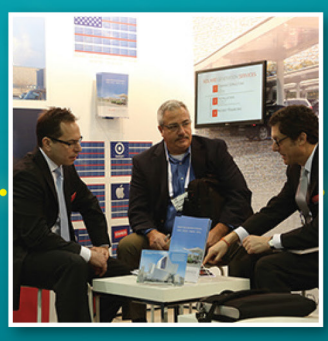
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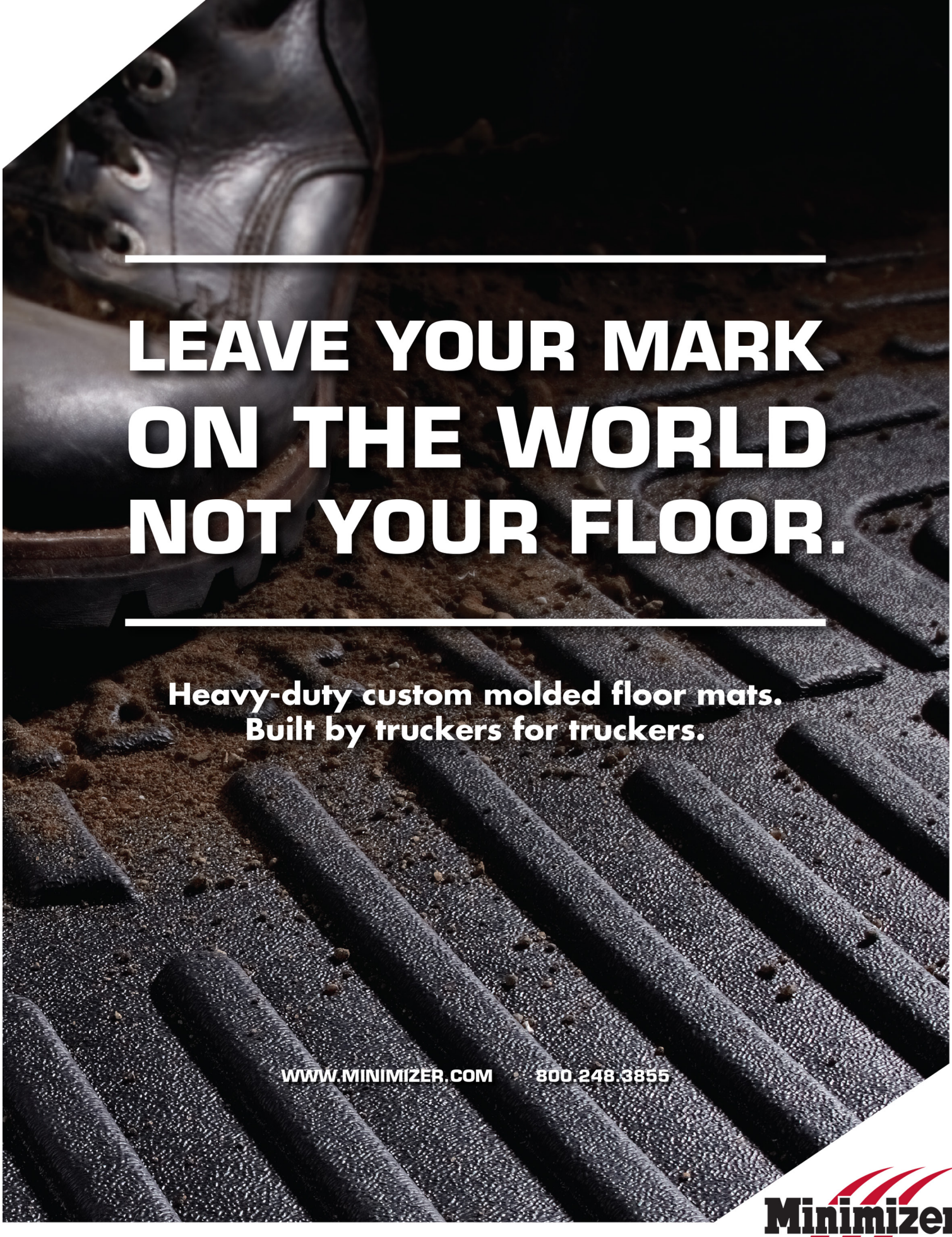
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# 5 Best Renewable Energy Sources




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*By Jon Strom*

Renewable energy sources no longer represent an economically viable dream of the future. They are here now, being implemented on mass across the globe. From Japan to Argentina, South Africa to Norway, nearly every country has a policy to generate at least 10% of their energy from renewable energy sources by 2020.

In this article we bring you a list of renewable energy sources, and summarize the 5 best renewable energy sources.

1) Solar energy

The sun is the ultimate source of almost everything that is alive on this world. The sheer quantity of energy that it releases means that solar power has the potential to be the biggest renewable energy resource.

The big challenge of course is to develop products which are capable of viably turning this energy into power, and in recent years big leaps have been made in this field. It is now possible to purchase solar panels from Chinese companies at half the price of just 3 years ago, and which are twice as efficient.

2) Geothermal energy

There is an immeasurably large amount of heat circulating up from the earth's crust, as the earth's core is super hot - about 70,000 C. Just under the crust is vast amounts of hot water, and by pumping this water up to the ground this energy has been tapped into in many countries in the form of Geothermal power stations, particularly in areas where the crust is thin. Individual homes have also tapped into the energy source and use it for heating and cooling.

3) Wind energy

Yet another unlimited source of power, wind power generators (turbines) have actually been around for many decades. One of the simplest ways to generate power from a renewable source, it does however require a lot of land to install wind turbines. The acquisition of suitable land has severely limited the application of wind energy. However, now a lot of research is been put into to developing wind turbine farms offshore.

4) Ocean energy

This includes wave energy and tidal energy. Both of these turn the movement of water into power. Wave energy buoys use the up and down movement of waves to compress air in and out of a cylinder which then powers a turbine. Tidal energy typically uses a large barrage which traps water as it ebbs and flows, and then passes over a turbine to generate power.

5) Biomass energy

This means exploiting the energy inherent in any living thing, typically plant material, such as oilseed rape. The material is specially grown and then burnt to generate electricity. Alternatively, it can be directly used as a fuel for vehicles. Biomass energy sources are effectively used like fossil fuels, but they are carbon neutral, as they release only the amount of CO2 that they absorbed when alive.

All of these energy sources are being heavily researched as we speak, and it follows that they will become yet more economically viable over the next few years. Finally, humanity is ready to move away from fossil fuels - but are the politicians ready?

*Jon Strom is a writer for the green energy and green investments blog http://www.bionomicfuel.com/. Click here for a rich variety of articles on renewable energy sources.*



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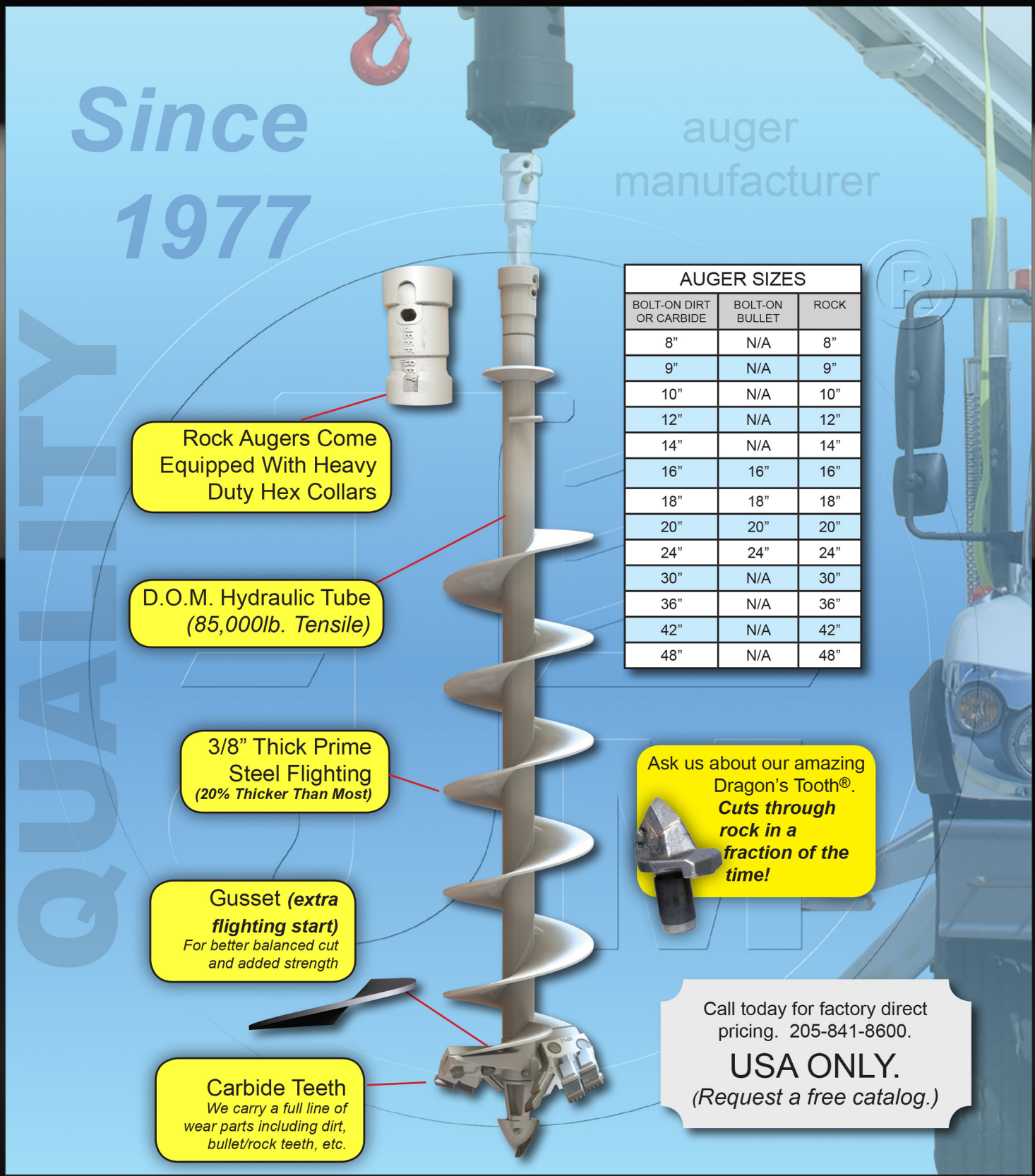
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| 18" | 18" | 18" |
| 20" | 20" | 20" |
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## Spark Your Interest with thermOweld®'s

## EZ Lite Remote® Electric Ignition System



*Getting the job done on time without delays. Does that spark your interest?* When the job is mission critical you **require** the versatility of thermOweld's EZ Lite Remote® System so you can finish your exothermic connections without delays. Our remote system is the only system that gives you 2 ignition options so you can finish your job on time.

- Use your Flint Ignitor or the EZ Lite Remote® and never be stuck out on the job!
- Have 100% confidence that you will get your connections done when you want!
- Reliable patented ignitor - 100% guaranteed to ignite
- Use with existing thermOweld® EZ Lite® Mold and Weld Metal

For more information on the thermOweld® EZ Lite Remote® Ignition System and other great grounding products thermOweld® has to offers check out www.thermOweld.com.

**thermOweld®**

*The Contractors Choice*

SDS

*Call Today, Ship Today!*

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