Brings Electric Light and Power to the Farm Home —from the Wind—at Almost No Operating Cost

Compare modern streamlined trains with the wood burners of years ago. Equally far ahead are modern streamlined WINPOWER Farm Light and Power Plants as compared with early wind operated plants. Bigger ... better ... capable of furnishing ample electricity not only for lighting the house and outbuildings, but for the electric washer, iron, water system, milker, and many other time and labor-saving appliances.

Powerful! The new WINPOWER is built to produce up to 400 Kilowatt hours per month (depending on location, equipment and time operated) whereas the average farmer on highlines uses only about 75 kilowatt hours per month.

A WINPOWER plant easily pays for itself ... through labor saving ... increasing farm production ... eliminating light bills, gas and oil bills ... besides making all city conveniences available to the farm home.

A WINPOWER is the finest investment you can make ... in comfort, convenience, as a MONEY-MAKER and a labor saver.

THERE IS NO CHEAPER POWER THAN THE WIND—USE IT!
What It Does

The WINPOWER is a Farm Light and Power Plant which has been developed over a period of twenty years exclusively for wind-driven service, capable of providing an abundance of electricity for rural homes at practically no operating cost.

WINPOWER brings city comforts to the farm home—makes housework easier and farm chores less toilsome. WINPOWER customers are independent, their power is free, and there is no tax on the wind. A few of the possible uses are illustrated here.

WINPOWER does more than plants merely assembled from standard parts because of its low speed, heavy duty generator is built for one purpose only, to efficiently convert wind power into electrical power. It is the result of over 20 years of practical experience and refinement.

The operation of WINPOWER is extremely simple. Current flows from the generator directly to the lights or appliances being used when the WINPOWER plant is running. Excess current flows to the storage batteries which provide for periods of calm or peak loads.

When installed on a tower 20 ft. or more above all obstructions and used with a battery of sufficient size to provide ample reserve, it will more than supply the average need for electricity in the home and on the farm.

REPAY ITS COST

Aside from all labor-saving comforts you can enjoy, your WINPOWER plant will pay you real dividends. Various state universities have proven that the following uses of electricity are profitable, and needless to say, they are even more profitable when you use surplus current from your WINPOWER which costs you nothing, instead of paying a high electric bill.

1. Electric lights in poultry houses will increase egg production tremendously during winter and spring—the time when eggs have greatest value.

2. Electric lights in barns at farrowing time reduce losses of young pigs, lambs and calves.

3. Clean water at well temperature in watering cups in dairy barns increases milk production tremendously, also the butterfat content, which increases its value.

4. Cattle being fed for market increase in weight if they can drink all the water they want at any time they desire to do so.

5. Use of an efficient indoor electric brooder for starting chicks ahead of the season will result in an early market and the highest possible price for spring broilers, and can be made to pay a good share of your plant's cost.

6. Temporary pasture fencing is profitable for stock raising. A one wire electric fence costs less than half, is easy to put up and is "hog tight" when used with an electric fence unit.

Why wait forever on that long-promised highline? TODAY there is a more economical, more practical source of electricity for the farm. Sweeping the country is an unlimited supply of free wind power... power that can be turned into electricity with a WINPOWER farm electric plant for less than a penny a week power operating cost. With WINPOWER you can have plenty of electric lights in your house, barn and yard. You can have an abundance of cheap power to do dozens of household tasks and make a hundred and one hard farm jobs easy.

It's Like Owning Your Own High Line
Direct Drive, Slow Speed, Heavy Duty Generator — More Power, Longer Life

16 POINTS OF DEFINITE MECHANICAL SUPERIORITY

1. 3-BLADE AIRPLANE TYPE PROPELLER. Starts turning with less wind, has more power and therefore enables unit to charge more in low wind velocities. It is better balanced, therefore causes less vibration.

2. DIRECT-DRIVE, SLOW SPEED GENERATOR. Starts charging at only 150 to 150 revolutions per minute according to size of unit and reaches top output at 150 to 350 R.P.M., thus it takes full advantage of the lower wind velocities.

3. GREASE SEATED BEARINGS. Both the generator and tower cap are equipped with dependable bearings ensuring years of trouble-free service. No towers to climb except for an occasional inspection.

4. COOL-RUNNING GENERATOR. A 3-way forced draft ventilates the powerful WINPOWER generator. Cold air enters the front of the generator through openings in the under side of the end bell, and strikes the commutator first which is the warmest part of the generator. Inside, the brake wheel fans the air and the suction of the propeller pulls the air out through openings in the propeller end of the generator. The WINPOWER generator really runs cool. This means greater generating efficiency.

5. VARIABLE PITCH CENTRIFUGAL FORCE GOVERNOR. This exclusive patented feature permits the plant to operate at maximum efficiency in a light breeze or a gale. As the wind increases in velocity, the governor automatically "feathers" the blades, letting the excess wind slide through, thus protecting the tower and plant against excessive wind pressure.

6. WINPOWER NEEDS NO TAIL VANE... The WINPOWER propeller acts as its own tail vane. Sudden gusts of wind do not whip unit out of line with air current. Propeller is in main wind stream at all times, and therefore maintains more constant speed. There is no tail vane to cause vibration.

7. FULLY ENCLOSED COLLECTOR RING. Large copper graphite brushes turning on banks of 90% copper efficiently deliver the current from the WINPOWER generator to your batteries. These brushes are fully protected from the weather.

8. EXCLUSIVE DISTINCTIVE POWER RING. The Power Ring is standard equipment on all 33 and 110 volt units, thus giving you extra power, better ventilation, smoother performance, and "all weather" protection.

9. POWERFUL, EASY OPERATING SHUT-OFF. A dependable brake that is trouble-free because it is enclosed and has regular automotive brake lining. Adjustable...Easy to operate!

CONTROL PANEL

TIMKEN ROLLER-BEARING TURNTABLE. Automotive spindle-type turntable supported by two large Timken roller-bearings. Grease sealed...Assures free turning with any change in the direction of the wind. "Turns easier than the front wheels on your car."

UNIVERSAL TOWER CAP. Fits all towers...3 or 4 leg windmill towers or brick towers for sectional guyed towers.

DELUXE INSTRUMENT PANEL. Has the latest type improved wind electric relay together with an ammeter, thus giving the exact output of the plant at all times.

FIELD AND LINE FUSES ON INSTRUMENT PANEL. No tower climbing to change fuses. Easy to inspect.

FEWER WEARING PARTS. Remember, your WINPOWER plant is a "direct drive." There are no gears to wear out and get noisy. (There is no separate tail vane to vibrate.) With fewer wearing parts, you eliminate tower climbing to replace worn-out parts.

SIMPLICITY OF CONSTRUCTION. Not only are there fewer moving parts, but make-shift designing in order to reduce cost is prohibited. You'll find WINPOWER not only much simpler in its construction but much easier to install.

MODERN STREAMLINED CONSTRUCTION. Not only is it more attractive but streamlined reduces wind, pressure and increases efficiency.

WINPOWER WIND ELECTRIC PLANTS

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Diagram Showing Why WINPOWER Power Ring Is So Effective And Develops So Much More Power

CONVENTIONAL TYPE WIND ELECTRIC PLANT

What is the power ring?

It is a large funnel-shaped ring firmly attached to the generator which slopes out to the propeller at the point where the pitch of the blades start, thus completely protecting the governor and the hub, and deflecting the air stream to a point which gives additional power to the propeller.

What are the advantages of power rings?

(1) The most outstanding advantage of the power ring is that it adds about 10% to 20% to the output of the generator, due to the fact that it utilizes every bit of the air which flows directly over the propeller hub which on conventional plants is not only wasted, but actually impairs the efficiency because the centrifugal motion of the air mashes out parallel to the effective portion of the propeller, reducing the power. (2) It gives "all weather" protection to the governor, thus permitting it to operate smoothly in sleet, snow, rain, or sandstorms. (3) It makes for a smoother, quieter operating plant, by decreasing the turbulent action of the air at the hub. (4) It makes the plant charge more evenly in gusty, shifting winds. (5) It definitely increases the ventilation making for a cooler, more efficient and higher output plant.

Why do you claim that a WINPOWER plant has the greatest output per pound of weight?

The rating of any generator or motor is determined by its heat rise at a given output for a given length of time. Therefore, by increasing the cooling through ventilation inside and outside of a generator, the same unit will have a much greater output than one of the same size and the same weight which does not have this ventilation feature.

There are three reasons why WINPOWER plants get so much better ventilation. (1) With the propeller on the opposite side of the generator from which the wind strikes, every bit of wind approaching the generator helps cool it and is not deflected away by a rotating propeller in front of the generator such as is the case with conventional plants with the tail vane. (2) The propeller end of every WINPOWER generator is open and the fact that this end of the generator is always on the opposite side from the wind, there is created a tremendous suction effect (exactly the same action as on a barn or building ventilator), which literally pulls the air through the generator. (3) All the air coming into the generator comes in directly below the commutator, therefore, the coldest air first comes in contact with the warmest part of the generator.

How frequently do grease-sealed Timken bearings need to be re-greased?

Timken engineers state definitely that if the bearings are properly packed at the factory, they will never require further lubrication, regardless of the number of years they are in service.

Is the charging rate of the WINPOWER constant or variable?

The charging rate is variable, due to the changing velocity of the wind resulting in different speeds of the generator. This, in itself, is one of the greatest advantages of a wind-driven lighting plant, due to the fact that it is much easier on the batteries.

Why is a centrifugally controlled, variable pitch governor better than any other type?

Any governor for a wind electric plant is primarily designed to protect the plant against excessive speeds, which would burn out the generator. A centrifugally controlled variable pitch governor not only does this, but in addition reduces the wind pressure against the entire propeller, and maintains a relatively constant speed at its top output. This is not true with "air brake" or "spoiler" type governors, which tend to increase the load on the top of the tower. Neither is this true with "slip the wind" type governors which depend purely on wind pressure, because sudden gusts of wind speed up the propeller before it has a chance to turn out of the wind. On the other hand, a centrifugally controlled variable pitch governor is actuated not only by wind pressure but by the speed of the propeller.

Is the WINPOWER plant built by a reputable manufacturer or by one who might go out of business in a short time?

The WINPOWER plant is built by one of the largest manufacturers of wind-driven lighting plants. The company is equipped with modern machinery and is located in a factory building of over 10,000 feet of floor space. It is also equipped with a complete testing laboratory for testing wind-driven plants. Its product has been sold in almost every section of the United States and upon almost every continent on the world.

What is your guarantee?

Our guarantee is the standard electrical manufacturers' guarantee against defective material and workmanship.

For Further Information See Your Local WINPOWER Dealer or Write

WINPOWER MFG. CO., Newton, Iowa, U.S.A.
HERE ARE THE ANSWERS TO

What causes the WINPOWER governor to act?

The action of the governor is caused by the "off-center" mounting of the wing (or blade sockets) on the propeller hub. The wing casting is hinged to the propeller hub long its one side (or the side that cuts into the wind) instead of its center. Each of the three wing castings is connected to the single adjusting collar or equalizer by a tension rod. As each wing casting pulls on the tension rod, the adjusting collar slides on the shaft compressing the single big heavy governor spring, keeping all three blades in perfect alignment.

What forces the WINPOWER governor to act?

There are four different forces which act on the WINPOWER governor to make it work. (1) Speed. The speed and the extra weight of the wing casting and flyballs being to one side of the hinge point causes each blade to wind around this hinge point increasing the blade pitch, reducing the pressure on the wind blade surface, and maintaining speed. (2) Wind Pressure. As the wind speed increases, the pressure against each blade is greater and due to the off-center mounting, the blades are more likely to lift off point increasing the pitch, reducing the wind pressure, and reducing the speed. (3) Vacuum on Airfoil. The airfoil created by the air foil on the forward side of the blade which is at the side furthest away from the hinge point, pulls the blade around the hinge point increasing the pitch, reducing the wind pressure, and reducing the speed. (4) Torque Created by Generator Load. As the generator comes up to its peak load, the torque or twisting action on the shaft creates a back or reverse action as the blades pull forward, resulting in them turning on the hinge increasing the pitch, reducing the wind pressure, and reducing the speed.

Why do you use a 3 blade propeller instead of a 2 blade propeller?

There are two reasons for this: (1) A 3 blade propeller produces much greater thrust at less than 10 miles per hour, and because 75% of all winds have a velocity of less than 10 miles per hour, then naturally a 3 blade propeller will produce more electricity over the entire wind pressure range. A 2 blade propeller is much smoother in its operation than a 3 blade propeller over a 2 to 1 ratio of blade speed. (2) The wind pressure is always equal regardless of the position of the propeller blades. To prove this point build two small sets of propellers, one a 2 blade and the other a 3 blade. Spin them, and you will see them sharply vibrating at the same wind speed. The 3 blade propeller will continue to turn smoothly but the 2 blade propeller will vibrate excessively.

What happens if the governor should fail to work?

Although the speed of the plant would increase considerably, no harm would result because the WINPOWER plant is completely protected with fuses which would automatically blow, and as a result stop the circuit altogether, thereby making the entire unit turn as a wheel rather than as a generator.

How does the WINPOWER follow the wind without a vane?

Due to the fact that each propeller blade is tipped back several degrees from perpendicular, then the governor acts as an enlarged vane which constantly keeps the plant headed into the wind. As each blade follows, the wind more closely than a unit with a vane, and at the same time does away with the springs and chains which make a vane so noisy.

How much wind does it take to start the plant to charging the battery?

A six to seven mile wind turns the WINPOWER propeller fast enough to start charging batteries. At this point the current starts flowing to the battery. Engineers have found that although it is possible to build a generator which might cut in at a lower wind speed. It is not feasible to do so because there is not really enough power in the wind below that point to keep a generator running. By this we mean that if the wind were blown in at about a four mile wind, then the speed would build up to this point, the load would be thrown off the governor, and because the load would be greater than the power of the wind, the propeller would immediately slow down and cut out again. When one realizes that the power of the wind increases as to the cube of the velocity, then he can realize how ineffective the winds less than six miles an hour really are.

Why not use a regular windmill wheel?

Engineers have found that the power of an airplane type propeller is many times greater than that of a windmill type because of the fact that there is no interference between each blade such as there is on the windmill type. It has also been found that one can increase the wind movement on the fan immediately following which cuts down on the efficiency of the wheel tremendously. Furthermore, because it is possible to get much greater speed and utilize the principal of the airplane propeller blade, the efficiency is increased many times more. Aeronautical engineers state that four times as much power can be extracted from the wind than that of a windmill wheel rather than the pressure of the wind against the blade. Therefore, by using this same construction in the making of the blades, their power is increased tremendously.

Another reason that it is necessary for a windmill wheel to have a large number of fans, where it is not necessary with a WINPOWER, is the fact that a windmill must start under a load, while there is no load upon the propeller of a WINPOWER until it gets up to a cutting in speed, at which point the propeller is developing considerable power.

Why is the WINPOWER so large and heavy?

Any slow speed generator is naturally much larger and heavier than a high speed unit. The reason for this is that electricity is developed by passing a wire through a magnetic field. The faster one passes a single wire through this field, the more electricity is produced and the greater number of wires are passed through the same magnetic field at one-half of the speed, then a like amount of current is produced. Therefore, by using a slow speed generator throughout to accommodate these additional wires, it is possible to get the same output at a lower speed. This is especially beneficial due to the fact that it is possible to start charging at a slow wind speed without losing anything through the friction losses of gears or belts.

Why not gear up the generator, and therefore, use one of a smaller size?

Gears or belts create much friction, dissipating the available energy in the low winds from which the most current is derived all the day. Can it be done away with? Yes, it is possible to eliminate these friction losses and increase the output of a unit during the low wind periods.

What are the advantages of a slow speed generator?

A slow speed generator has many advantages over a higher speed unit. (a) It is much more efficient in the lower winds due to the fact that there is no friction loss through a multiplicity of gears. (b) It does away with many moving parts which wear and cause trouble. (c) It eliminates friction and wear which would naturally be more prevalent in a higher speed unit. (d) It reduces annual maintenance costs due to the reduction in number of parts.

What happens if the wind does not blow?

The WINPOWER plant operates much the same as an ordinary windmill in that it operates on the wind blow and requires a storage tank, or battery, which serves as a reservoir when the wind does not blow, in effect collecting less electricity being used than the WINPOWER is producing. The larger the battery, the longer one can go without wind.

How large a battery do I need to carry over this period of calm?

The actual size of the battery depends to a large extent upon the amount of current or electricity you plan to use. However, it is found that a large battery is much more satisfactory than a small battery, because it is commonly used on gasoline engine plants, because it gives the added supply of electicity, and the generator really costing less than a small battery when figured over a several year period. For the average farm installation we recommend about a 400 ampere hour battery.

Can I mount a WINPOWER plant on top of my house or barn?

Because the WINPOWER plant is quite a large unit and because the wind currents on the top of a house or barn are very often deflected, it is not practical to mount a WINPOWER plant on any structure. It is absolutely essential that the WINPOWER plant be mounted on a tower which is at least twenty feet above the ground and in a place which is free from obstructions. A tower mounted on a tower which is at least twenty feet above the ground and in a place which is free from obstructions is an added cost but the cost of the tower can be paid for by the increased efficiency of the generator.

Why do you recommend such a high tower?

The higher the tower the higher the wind blows. the more constant and less turbulent are the wind currents, which means that the output of the plant mounted on such a tower is increased. This is absolutely essential that the WINPOWER plant be mounted on a tower which is at least twenty feet above the ground and in a place which is free from obstructions. Any additional cost that this requires will be paid for by the increased efficiency of the generator.
SOME INTERESTING QUESTIONS

Even though there are very few obstructions, we recommend that the lower sixty feet high, due to the rolling action of the wind as it passes over the ground, which naturally decreases its effective power.

Can I put the WINPOWER plant on my regular windmill tower?

It is all right to install the WINPOWER on an old windmill tower provided the tower is in good condition and at least twenty feet above all obstructions within 500 feet.

Is it necessary to shut the plant off in strong winds?

The WINPOWER plant has been designed to withstand winds up to hurricane proportions without harm. However, it is not recommended that the plant be permitted to run during a storm because it is very often hard to tell at the start of a storm how much wind will blow before the storm has passed. WINPOWER plants have been known to go through recorded winds of eighty miles an hour.

What size plant should I buy?

For the average farm home located in an area where windmills work satisfactorily, the 1250-watt WINPOWER plant is the ideal plant, as it will produce plenty of electricity for lights, washer, radio, water pumps, pressure system, iron and a multitude of other appliances. It will also be large enough to operate an efficient electric refrigerator, providing you use no less than a 430-ampere hour 32-volt battery.

The 800-watt plant will take care of the above electrical uses except the refrigerator. However, under favorable wind conditions and when used in conjunction with the large 430-ampere hour battery it will also take care of an electrical refrigerator.

The 32-volt plant will take care of the above electrical uses except the refrigerator, filling stations, tourists camps, etc., the larger plants can be used. With each of the larger plants never use less than the 430-ampere hour battery and never for 110-volt installations in which case it is possible to use 56 cells of the 186-ampere hour battery.

Always remember in selecting a WINPOWER plant to get a size large enough to take care of your future needs as well as your present needs. You will always be adding additional appliances because the extra electricity you obtain costs you nothing.

Can I obtain the same appliances for your 32 and 110 volt direct current plants as I can for alternating current such as I would be able to get in town or on the high line?

Yes, you can get practically the same appliances, with the exception of an electric refrigerator and the large motors which should not be used on any plant equipped with storage batteries.

What is the difference between the 32 volt and the 110 volt plant?

A 32 volt plant is one whose voltage is less than a third that of the 110 volt, which means that one only need have one third the number of battery cells and yet obtain the same amount of power. Another advantage of the 32 volt plant is the fact that because the voltage is so low there is not so much danger of shock.

Is it necessary to use heavier wiring on a 32 volt system than on a 110 volt system?

Yes, because there is not so much pressure pushing the electricity through the wires. On the average installation this can easily be overcome by putting in the proper sized wiring as shown in the instructions book.

Why are your direct current plants instead of alternating current plants?

Due to the fact that it is necessary to store storage batteries when the wind does not blow, then most wind electric plants must be direct current units, which is an advantage in that direct current produces a much whiter light with no "flicker" such as you have with alternating current.

How does a WINPOWER plant compare in size to a high line service?

When one figures the hook-up charge plus the month-by-month power bill, then a WINPOWER plant is much cheaper than high line service. It is especially true if you use all the current your plant is capable of generating.

Can I supply light and power for more than one farm?

If the two farm homes are close enough together so the current can be transmitted without too much loss, and neither farm uses an excessive amount of electricity, it is possible to supply current for two places. It must be remembered, however, that it is not practical to try to transmit electricity on a 32 volt system over 600 feet.

How far from the batteries should the plant be located?

We do not recommend that a 32 volt plant be over 400 feet from the batteries. Due to the drop in voltage when the current is carried that distance. Even then, it is necessary to compensate for the longer distance by using a much heavier wire.

Where should I put the batteries?

Batteries should be located in a place where they can be kept clean and are not subject to the extremes of temperature—the best place is in your basement. You should also try to place them as close to the central point of distribution as practical to eliminate transmission losses.

Why don't you rate your plants by their kilowatt output per month?

If every user had the same height tower, the same size battery, the same electrical load, the same wind obstructions, the same wind conditions, and permitted his plant to run continuously this would be possible. However, when one considers the many variables in every installation he quickly realizes the falseness of such ratings. The true rating on any generator is its wattage output (volts times amperes) over a certain period, without an excessive temperature rise under normal conditions. Therefore, the only sure way of a person knowing that he is getting what he is paying for is to have a plant equipped with a voltmeter and ammeter which will give him his true output at any time. There is no more sense in rating a plant by its kilowatt output per month than in determining the size of a bucket by the number of bucketfuls you will carry in a month.

How long will a WINPOWER last?

This is an extremely difficult question to answer, due to the fact that it takes so long to run a test upon it. However, most of the first WINPOWER plants, which were built 10 to 15 years ago, are still giving the customers good service with cheap electricity all this time. The improvements which have been made in these units in the last few years by cutting down the speed and building them so much more ruggedly, the present units should last for years and years, and even then could easily be given another span of life by possibly replacing the bearings and reconditioning the plant at a moderate expense.

Won't lightning strike the tower and ruin my plant?

No, on the other hand, the fact that your tower is higher than all other trees and buildings is grounded. It serves as perfect lightning protection for your entire farm.

Does ice or sleet effect the WINPOWER?

The WINPOWER, such as many other objects in a sleet storm. will naturally become coated with ice, and likewise the speed of the propeller blades will be diminished. However, all working parts of the generator and the governor are protected and, as a result, will not be affected by ice or sleet.

How long have wind-electric plants been in use?

Although the average person has not heard very much about wind-driven lighting plants until the last few years, our records show that the first plant of this nature was built back in 1894 by Mr. W. L. Bliss for Colonel Lewis, who invented the Lewis Machine Gun. This plant was used along the breakwater in New Jersey and we understand it is still operating today.