

# **FREE SUPPLY OF POWER TO AGRICULTURE – WAYS TO MAKE THE SCHEME SUCCESSFUL**

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There are three causes for the crisis that the power sector is facing at present. These are: increasing power purchase costs, capital expenditure of thousands of crores of rupees not yielding much, and considerable increase in power consumption in agriculture. At the same time increasing revenues helped to counter in the crisis from going out of control. Income of the power utilities increased from Rs.4,363 crores in 1998 to Rs.9,258 crores in 2004. Apart from tariff hike, decline in T&D losses from 38% in 1998 to 24% in 2004, increasing billing percentage, and increased power consumption by industrial users contributed to this rise in incomes. But during the same period expenditure of the utilities increased from Rs.5,448 crores to Rs.10,771 crores. That is expenditures are increasing along with incomes. Long-term solutions to the problems faced by the power sector lies in the steps taken by the government in addressing the above three issues.

80% of the expenditure of the power utilities goes towards power purchase costs. The present government is paying attention to bringing down these power purchases cost. A committee with the finance minister Sri. K. Rosaiah as Chairman is appointed to review the power purchase agreements. The Chief Minister also called upon Genco to explore the possibility of reducing its power generation costs by 15 to 20 percent. If sufficient quantity of gas is not available to the four private gas based power projects which are expected to be connected to the grid in the near future we have to bear heavy burden of payment towards fixed cost. This could land the power sector in serious crisis. Besides this, though the capital expenditure on T&D systems is not yielding any returns, the power utilities are arguing that this expenditure is necessary to supply quality power. But this expenditure should help to bring down technical losses.

The other problem that the power sector is facing in the state is related to power supply to the agriculture sector. Better we call it a challenge, rather than a problem. World over developing countries are searching for solutions to this problem. In our state supply of power to agriculture has become not only a socio-economic issue, but also a political issue. Supply of power to agriculture is only among many important problems faced by the power sector in the state. But even a small mistake in supply of power to agriculture will be considered as a major failure. The whole country is watching how the state government addresses this delicate issue.

In understanding the problems involved in supply of power to agriculture it is very vital to comprehend the nature of this problem. Power consumption in the agriculture sector and revenues from sale of this power to agriculture are the two important issues involved here. We shall examine them here.

## **I. Power consumption in the agriculture sector**

According to TRANSCO agriculture sector is accounting for one third of the power consumed in the state. In the year 2003-04 TRANSCO purchased 4593 crore units. Out of this transmission losses were 1175 crore units. The remaining 3418 crores units reached the consumers. In this the share of agriculture is 1266 crore units. But there is no single opinion on this among the experts. Power supply to agriculture is not metered. According to some experts in order to show lower T&D losses agriculture consumption is inflated. For example in the year 1982 in a state power supply to agriculture was metered. Then there were 4.86 lakh pumpsets and power consumption was 94.2 crore units. At present there are 23 lakh pumpsets in the state. If unauthorized ones are also included this will number 26.5 lakhs. When compared to 1982 the number of pumpsets increased by 5.5 times. Then commensurately power consumption in the agriculture sector should be  $(94.2 \times 5.5)$  518 crore units only. This implies that the TRANSCO had inflated the figures by 748 crore units.

TRANSCO counters this by saying that because of groundwater depletion water had to be pumped from deeper depths and also horse power of the pumpsets increased. Because of this agriculture power consumption increased and 1982 situation cannot be compared with the present situation. But it was shown that after 1982 number of pumpsets increased because of increase in number of agriculture land holdings. Large holdings were parceled into smaller holdings followings family splits. Though total cultivated area did not increase the total number of pumpsets has increased. Experts are of the opinion that though the horse power of the pumpsets has increased, as the cultivated area remained the same power consumption would not increase. In fact, 20% of the pumpsets listed by TRANSCO are not in use, and in 1982 there were no restrictions on power supply. This shows that power consumption in agriculture sector should not cross 600 crore units.

In the background of these differing view points the argument for metering agricultural pumpsets has surfaced. But owing to resistances from the farmers TRANSCO decided to meter the transformers connected to agriculture loads. Out of 60,000 agriculture transformers 30,000 are metered. Based on the readings of these meters only agriculture consumption is estimated. But farmers and some experts did not agree to these consumption estimates. This has only led to more confusion. Some are of the opinion that the only way out of this confusion is to meter all the agriculture pumpsets. TRANSCO is also of the same opinion. Farmers are resisting this proposal seriously. Metering of agriculture pumpsets has become a controversial issue. Understanding this issue is very critical to address the problem of power supply to agriculture.

### **Is it necessary to install meters for agriculture connections?**

There are three reasons for metering agricultural pumpsets. First, T&D losses can be estimated accurately by knowing agriculture consumption. Second, consumption based charges can be collected from the farmers. Third, misuse of power can be checked in the agriculture sector.

The first reason shows that in order to estimate T&D losses agricultural pumpsets should be metered. In fact, there is not much difference in metering agricultural pumpsets and fixing the meters on the transformers that specifically meet agricultural loads. Metering the transformers may lead to some difference. There are two reasons for it. First, transmission losses between the transformers and pumpset will not be recorded in these meters. Second, some transformers may feed other users along with agricultural connections. Because of these we may not be able to estimate the agricultural consumption accurately. But this can be used to estimate the power consumption in the agriculture sector with  $\pm 10\%$  accuracy.

The question that has arisen is how accurate should this estimate be? Take for example, actual consumption is 1000 crore units, but the above estimate arrives at 900 crore units or 1100 crore units. With this small gap sky is not going to fall. This is because this error comes to about 2 to 3 percent of the total power consumed. T&D losses can be estimated with small error with this method. It is a misnomer that T&D losses can be estimated accurately with the metering of all agricultural connections. There are three reasons for this. First, theft will not be eliminated with the metering. If some one draws power unauthorisedly by hooking to the overhead lines this will not come under metered consumption. In fact if meter is installed at the transformer this consumption can also be accounted for. Second, even if 26 lakh pumpsets are metered, all these meters would not be working properly. At present out of the total meters installed for the domestic connections 20 lakh meters are exceptional, that is these are either stuck, slow moving or burnt. In the case of agriculture sector the possibility of the proportion of exceptional being high is very real. This is because, as the agriculture connections are spread all over it is difficult to attend to the repair of these meters promptly. As a result exceptional in the agriculture sector will be at least 10%. To that extent estimate of consumption will be under reported. This, agriculture sector power consumption is based on these meter readings. It is not a small thing to get correct readings of all these 26 lakh meters. This is so because, meter reading, billing and collection involves lot of work, and additional personnel needs to be appointed. According to an estimate metering cost accounts for 20% of the revenue. Another issue is they are not able to do the reading of the 30,000 transformers. These readings have become controversial. Can they do the job of reading 26 lakh meters properly? What is the cost involved in metering? It is estimated that it will cost Rs.500 crores to procure, install and protect these meters. Is it at all necessary? After all this labour and expenditure whether the estimates after all this labour and expenditure whether the estimates arrived from metering pumpsets will be any better than from the estimates based on metering the transformers. There is no unequivocal answer. Even if the estimates are 100 percent accurate, what is the additional benefit? The expenditure meant for metering can be used to bring down T&D losses. Like in many other developing countries in our country also agricultural connections were metered until 1970s. As the expenditure of metering had increased these meters were removed later. Even many expert committee suggested this. At many places even when meter was there consumption was charged on horse power (flat rate) basis. In Pakistan also pumpsets were metered until 1970s and they were removed later. These pumpsets were metered again in 1999 under pressure from the World Bank. Maintenance of these meters posed

many problems and their continuance is doubtful. In Pakistan total agricultural pumpsets number 5 lakhs only.

These are only one fifth of the number of pumpsets in our state. One can imagine the situation if meter were installed at all the agricultural pumpsets in our state. One can imagine the situation if meters were installed at all the agricultural pumpsets in our state.

The second benefit expected from metering is to collect the consumption based charges. The case of the horse power based collection will not be there under this method. Monthly or bimonthly billing involves many problems. Even if meter reading and billing are done over in six months farmers will not be in a position to pay such a huge bill. In the meantime if some problem crops up with the meter it is difficult to get in repaired / replaced.

### **Income from agriculture**

Income to the power utilities from supplying power to agriculture in 2004 is about Rs.400 crore only. Farmer with 5 HP motor pays Rs.425 per HP per year. Along with their customer charges of Rs.20 per month needs to be paid. With congress party coming to power free power for agriculture is being implemented. But the customer charges are being continued. This means burden of free power supply amounts to Rs.400 crores. Subsidy of Rs.400 crores for 26 lakh families is not a big amount. But how did the opinion that free power supply is not possible has come about?

The argument of those who say that supply of free power is not possible is like this. For example, for the year 2004-05 according to the Regulatory Commission supply of power to agriculture costs Rs.1,840 crores. Out of its Rs.821 crores comes as cross subsidy from the industry, state government provides a subsidy Rs.610 crores, and the remaining Rs.409 crores will be collected from the farmers. Because of free power supply to agriculture Rs.409 crores burden will be added to the government subsidy of Rs.610 crores and total subsidy burden will be Rs.1019 crores. Besides this, according to the Electricity Act 2003 cross subsidies will be eliminated gradually. This implies that this burden is to be borne either by the government through increased subsidies or by the consumers through higher tariffs. As this government is already burdened with Rs.1000 crore subsidy it is not possible for it to take upon some more subsidy burden. So hiking the tariffs is the only solution! While there is need to increase power tariffs free power supply scheme implies that farmers need not pay any charges at all. They argue that this is not only against the spirit of reforms but also goes against the Act.

Let us examine the veracity of this argument. The above argument depends on the cost of supply of power to agriculture. The above expenditure figures of Rs.1840 crores is based on the 'cost-to-serve' estimates adopted by the Regulatory Commission. This in turn is based on many assumptions, and if these assumptions change the cost estimates also change. The Regulatory Commission did not give satisfactory responses to many of the question raised by experts on this 'cost-to-serve' estimates adopted by them. For example, according to the commission cost-to-serve for industry is Rs.2.10 per unit. But

industries are charged about Rs.4 per unit more. The Commission says that this is used to cross subsidise agriculture and domestic sectors. But private power generators are not in a position to supply power at Rs.350 per unit including the wheeling charges. This means that industries are paying only 50 paise more than what they should have paid. This shows that the cross subsidies arrived at by the commission depends on the cost-to-serve method adopted by it.

Then, what is the burden because of this free power supply to agriculture? We have to understand that the answer to the question depends on what the farmer is able to pay for the energy consumed by them. Maximum, the present tariff can be increased by 50% only. If it is increased more than that farmer may stop using power or he may use other means to get electricity. This implies that from agriculture sector a maximum of Rs.600 crores revenue can be collected. If we deduct the administration costs net income will be about Rs.560 crores. But a doubt will arise that the subsidy borne by the government is more than this. One way to escape from this burden will be to stop supply of power to agriculture. But this is not possible. Government can not view every thing from commercial view point. It cannot escape its social responsibility. So government has to bear some subsidy burden. This burden can be reduced by increasing sales to the industrial sector and use the additional income to pay for this subsidy. It is not correct to say that free power to agriculture is an unbearable burden.

Then why is the government facing problem? Where lies the problem? In fact problem is not there in free power supply, but in the supply of power to agriculture itself. Free power supply scheme can be looked at from another angle. While the previous government charged 30 paise per unit from agriculture the present government is charging '0' paise. This implies that the difference is only 30 paise per unit. If we look from this angle it becomes clear that there is no difference between the provision and present governments. This also implies that problem is also an old one. But because of the prominence given to agriculture by the present governments every development in this is looked with magnifying glasses. This does not mean that there is no problem. We have to only understand that this is not a new problem.

If free power is not the problem, what is the real problem? Let us go back to the issues we mentioned earlier: one – agriculture power consumption and two – income from this sector. If we look at from income side additional burden appears to be not much. But same is not the case with consumption. Expenditure incurred by TRANSCO for supplying every unit of power to agriculture is more than the income received from it. If these units are directed from agriculture to the industry income will increase by ten times. This means that income raised by selling ten units of power to agriculture can be obtained by diverting one unit to the industry. From this we can understand that solution to the present problem lies not in increasing the tariff to improve revenue but in limiting consumption in agriculture. What will happen if consumption in agriculture sector instead of coming down increases further? The resultant burden will be huge. This is because TRANSCO buys power from generating station on the basis of 'merit order dispatch'. According to this method first power will be purchased from low cost generating stations, and next power from high cost station will be purchased. If the agriculture consumption

increases the necessary power needs to be purchased from high cost generating stations. But there will be no commensurate income. Another thing is, power to agriculture is supplied at low voltage. And at low voltage transmission losses will be more. If consumption in agriculture increases burden on power utilities will also increase. So it is necessary to limit power consumption in the agriculture sector.

There are many ways of reducing power consumption in the agriculture sector. Some of these measures have been already followed by the government. We shall examine all these.

### **1. To limit hours of power supply**

Until 1982 there was no restriction on hours of power supply. Later gradually this was brought down to 7 hour a day. But this not give expected results. Farmer wants to pump enough water. To draw more water during the hours of supply high horse power motors will be installed. If it did not adduces the problem additional borewells will be drilled. Limiting the hours of power supply is one of the reasons for the spread of borewells. Besides this as farmers are using phase-convertors consumption during other hours is also increasing. Besides this because of use of automatic starters transformers are affected badly. Use of automatic starters is one of the important reasons for breakdown of transformers in the agriculture sector. It is important to study pros and cons of limiting power supply. In Karnataka when power supply hours was increased experimentally in one district initially power consumption increased by 20%, but this gradually came down to 10%. This besides being comfortable to the farmers brought down the transformer breakdown rate considerably. Costs and benefits of limiting the hours of supply should be compared with the crores of expenditure involved in implementing this....

### **2. Limiting the number of new connections**

If consumption is to be within limits, a limit should be there on new agricultural connections. In our state the government set a limit of 50,000 new connections in an year. This is appropriate. If more connections are to be issued it involves huge capital expenditure. According to TRANSCO estimates each new connection costs about Rs.30,000. Installation of new transformers, erection of poles drawing of power line and other involve huge costs. This shows the necessity of government taking steps against unauthorized connections. But, to say no when farmers come forward to pay full tariff is not good. Along with free power schemes like Tatkal should also be there. Until the regular connections are issued Tatkal scheme will meet the needs of the farmers. Otherwise it may lead to proliferation of unauthorized connections.

### **3. Installing the meters and restricting the free power supply:**

Under this method agricultural connection will be metered and a limit will be placed on the quantity of free power supplied. In this whether to install the meter at pumpset or at transformer is a critical issue. What should be the limit on free power supply is another important issue. Above we have seen the problem involved in metering the pumpsets. So

meter should be installed at the transformers. The consumption of each pumpset in turn depends on the limit we impose on them. For example, 1200 crore units are consumed by 25 lakh pumpsets. If consumption is restricted to 1000 crore units, each pumpset should consume 4000 units only. If consumption crosses this limit minimum tariff should be levied. As meter is installed at the transformer this should be carried out collectively. For example, say there are 20 pumpsets under a transformer. These pumpsets together shall not consume more than 85000 units including transmission losses. If the consumption crosses 85000 units some tariff shall be imposed. This can be 50 paise per unit. What if the consumption is less than 85000 units? Then farmers under the transformer shall be given incentive as per unit basis. Some one may doubt the logic behind this. They may question, why shall farmers be paid incentive when they were given free power? If one unit is saved TRANSCO will get a benefit of Rs.250. if farmers are given an incentive of 50 paise per unit both sides will profit. If there are no incentives farmers will not feel the necessity of saving power.

There are some problems with the above method. Some farmers may not be willing to be part of a collective. They may fear that others will consume more power, or others pumpsets are not efficient while they have spent money on improving efficiency. They may not be ready to share the incentives with others. Those who think like this will be asked to install meters at their pumpsets at their cost. And the above incentives will be applicable to them also.

There are many benefits in implementing this method. Farmers will resist unauthorized connections as they will burden them. At present farmers are not resisting unauthorized connections. As every pumpset is not metered this will reduce the costs on metering. If some farmer wants a separate meter through burden will not be on TRANSCO. If the metered farmer resorts to power theft others will resist it. Otherwise that consumption will be recorded at transformers meter and the consequent burden will fall on all other farmers. It is necessary to increase the participation of the farmers if agricultural power consumption problems were to be overcome. With the above method objectives of both the farmers and the power utilities will be served.

Some of the issues involved in this need to be discussed and debated. Whether consumption limit should be based on number of pumpsets or on the basis of horse power. If a farmer has more than one connection whether this consumption limit is to be placed on all the connections put together or on each connection. If consumption limit is to be applied on each connection, how many connections should be allowed? Even if cultivated area is the same power consumption will be changing from region to region. Under such conditions what should be the limit? It is not difficult to come to an opinion on this.

#### **4. Big farmers and corporate farming should be exempted from free power supply:**

At present free power supply in our state is extended to all farmers without any distinction of small and big farmers. There are two arguments on why free power supply

shall be taken up. First, under the canal irrigation a farmer who raises two crops pay Rs.400 per acre. Under this farmers do not incur any additional capital expenditure. Under the borewells a farmer pays a similar amount per an horse power. One horse power is sufficient to irrigate an acre. But borewell farmer incurs additional capital expenditure of Rs.50,000 to Rs.1,00,000 per borewell. But they do not get any additional price for their crop because of this additional capital expenditure. So the farmers who depend on ground water should be supplied power free of cost. Second, in calculating the minimum support price power is not taken as a input. As the cost of power is not included in the support prices, farmers argue that power should be provided freely.

In spite of the above arguments, if restrictions are not placed on free power consumption the whole scheme will be in jeopardy. 'Free' itself implies that it is for those who can not afford. In any thing unlimited freebies are not good. People would appreciate if big farmers and corporate farms are exempted from free power supply scheme. To that extent criticism of the government will also come down. In our state in total agriculture holdings big holding s of 25 acres and more account for less than one percent. But they cultivate more than 10 percent of the land, and consume more than 20 percent of the power consumed in the agriculture sector. The exemption of these large farmers from free power supply not only adds to the income of the power utilities but also helps to implement the scheme successfully by making small and marginal farmers only eligible for this free power supply.

#### **5. Promote crops that need less water:**

Crops like paddy require large quantity of water. Because of this these crops also consume lot of power. As an alternative the government should promote commercial crops like cotton and chillies. Paddy is a traditional crop. Generation of farmers had grown paddy crop. Because of minimum support price given to paddy unlike other crops no risk is involved in cultivating paddy. Under such conditions it is not easy to motivate farmers to take up other crops. Along with minimum support price to these crops government should provide crop insurance cover, marketing facilities, and also farmers should be saved from the clutches of traders/middlemen.

#### **6. Improving the efficiency of pumpsets:**

Least importance is given to this very important issue. In our state efficiency of pumpsets is only 20%. Pumpsets made with ISI standards have an efficiency of 60%. Even higher efficiency pumpsets are available in the market. According to an estimate in our state less than 50% of the pumpsets are ISI marked pumpsets. As consumption based electricity tariff is not in operation farmers are not bothered about the make of the pumpsets. Compared to the other pumpsets available in the market ISI marked pumpsets are 40% more costly. Because of this farmers are buying other pumpsets. These pumpsets consume more power. Power utilities have to bear this burden. Along with standard pumpsets, if HDPE pipes, frictionless foot valves, capacitors, proper size of discharge – suction pipes are used considerable amount of power can be saved. Under the horse power based flat rate farmers do not have incentive to follow these measures. To follow

these measures farmers have to invest large amounts of capital. Having recognized the importance of improving power consumption efficiency in the past the Regulatory Commission announced some incentives. According to these incentives farmers who use HDPE pipes, frictionless foot valves, capacitors and ISI marked pumpsets will be given a rebate of 50% of their charge, and this concession will be in force for more than two years. But not a single farmer in the whole of the state had come forward to avail himself of this incentive. There are two reasons for this. First, these incentives were not propagated properly among the farmers. Second, the important reason is the capital to be invested in order to benefit from this incentive is very high. For example, a farmer with 5 HP pumpset has to pay electricity charges of two thousand rupees. If the farmer follows the above measures he will get a concession of one thousand rupees. But in order to be eligible for this farmer has to invest more than Rs. 15,000. And interest it self will be more than on thousand rupees! This shows that the cost of implementing it is more than the incentive offered.

The power utilities will benefit greatly if the above mentioned efficiency measures were introduced. The Hyderabad based Central Institute for Rural Electrification has already done a lot of research in this direction. This Institute has scientifically proved that with minimum expenditure lot of wastage in power consumption in agriculture can be brought down. Just by replacing the usual foot valves with frictionless foot valves 10 to 15% of the power can be saved. In our state more than 40% of the pumpsets are using the usual foot valves. This Institute has claimed that if all the efficiency improvement measures mentioned above are implemented 50% of the power consumed can be saved. While purchasing pumpsets many parameters need to be examined. Farmers are not aware of these. In all these matters farmers depend on the electricians in the village. Technical knowledge of these electricians is also limited. There is need to provide proper training to these electricians. All this shows that farmers' cooperation and their education is very important in improving power consumption efficiency in agriculture.

### **Conclusion:**

Limiting power consumption in agriculture is very critical in the successful implementation of free power supply to agriculture. In this elimination of big farmers and corporate farming from the free power supply, encouragement to farmers to save power, and measures to improve pumpset efficiency are important. This scheme can be implemented only with the cooperation of the farmers. For this it its very important to educate farmers and provide necessary technical training to the electricians in the villages. Participation of NGOs in all these activities also should be encouraged. This task should be taken up as a movement.

There is one issue that all of us should take note of – what farmers need is water but not electricity. Comprehensive planning is necessary to tackle the problem of power supply to agriculture. Attention should be paid not only to problem of power supply but also to the depletion of ground water level. In our country where majority of the people depend on agriculture farmers should be made central to the electricity sector reforms.

