

# **PM KUSUM** Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyan



A New Green Revolution...



## हमारे किसान अन्नदाता हैं, ऊर्जादाता बनें।

- Prime Minister Narendra Modi



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# PM's VISION for Farmers Harvesting Solar Energy

" Our farmer is so capable today, so resourceful that today he is helping the country with not one, but two types of plants. One plant is that of traditional farming by which we all get food. But now our farmers are also installing other types of plants, so that electricity also reaches their homes. The first plant, which is traditional farming, is planted by our farmer on such land which is fertile. But the other type of plant is the solar energy plant, which will also be installed on such lands which are not fertile, or not good in terms of growing crops. That is, the farmer's land where the crops cannot be grown will also be used. It will also increase the income of the farmer.

Solar pumps of lakhs of farmers across the country are also being connected to the grid. The electricity generated from this will be used by the farmers for their irrigation and they will be able to sell the surplus power.

# **PM-KUSUM:** A Multi Sector Reforms Initiative

Government of India has taken various policy measures to fulfil its commitment made in Paris Climate Agreement in 2015 to have 40% of installed power generation capacity from nonfossil fuel sources by 2030.

To provide energy and water security to farmers and enhance their income, de-dieselise the farm sector, and reduce environmental pollution, the Government of India approved PM-KUSUM on 19.2.2019. The approved scheme comprised of three components:

**Component-A :** Addition of 10,000 MW of solar capacity through installation of small solar power plants of capacity upto 2 MW

**Component-B**: Installation of 20 lakh standalone solar powered agricultural pumps

**Component-C :** Solarisation of 15 lakh existing Grid-connected Agriculture Pumps

PM-KUSUM scheme is one of largest initiatives of the world to provide clean energy to more than 35 lakhs farmers by solarising their agriculture pump under component B and C.

The scheme also has direct employment generation potential. As per available studies, around 24.50 job-years are created per MW of small capacity solar installation. Therefore, besides increasing self-employment, the scheme is likely to generate employment opportunities equivalent to 7.55 lakh job-years for skilled and unskilled workers.



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# Harvesting Solar Energy

## **Component-A : Decentralized Grid Connected Solar Power Plants**

Small solar power plants of capacity upto 2MW can be set-up by individual farmers/ cooperatives / panchayats / Farmer Producer Organisations (FPO) on barren/ fallow/marshy/ pasture or cultivable lands. In case, cultivated fields are chosen for setting up solar power plants, the solar panels are set up above a minimum height so that the farmer can continue to grow crops below solar panels.

Power generated from solar plants will be purchased by the Distribution companies (DISCOMs) at tariffs determined by the respective State Electricity Regulatory Commissions (SERCs). The plant can be installed by the farmer or he can provide his land on lease to a developer, who will install the plant. MNRE has issued a model Power Purchase Agreement (PPA) and a Model Lease Agreement.

The scheme will open a stable and continuous source of income to the rural land owners for 25 years. It has been estimated that farmers will earn up to Rs. 25000 per acre per year if the plant is installed by a developer/ CPSU on the land leased by the farmer, and up to Rs. 65000 per acre per year if they install the plant themselves by taking loan from the banks.

The RBI has included this Component under priority sector lending and therefore Banks will provide loan at competitive rates and on soft terms. The following financing options are available to farmers:

- They can take loan directly from bank and pay EMI from the revenue generated from sale of power to DISCOMs. The balance revenue will be the farmer's income.
- 2. DISCOMs may take loans on behalf of farmers by signing a tripartite agreement between the farmer, the bank and the DISCOM. The DISCOM will directly pay EMI from revenue generated

from sale of solar power and transfer the balance amount to the farmer's account.

3. Public or private solar power developer/EPC contractor may also take loans on behalf of farmers by signing quadripartite agreement between the EPC contractor, the farmer, the bank and the DISCOM. The DISCOM will directly pay EMI from revenue generated from sale of solar power and transfer the balance amount to the farmer and the EPC contractor in the agreed ratio.

After the loan is repaid, the total revenue from sale of solar power will constitute the farmer's income.

The solar power plants will be preferably installed within five km radius of the notified sub-stations in order to avoid high cost of transmission lines and losses. DISCOMs will notify sub-station wise surplus capacity upto which generation from solar power plants can be added. DISCOMs will invite applications from interested beneficiaries. The selected applicants will have to sign PPAs for 25 years with DISCOMs and install the plant as per the provisions of the scheme guidelines and applicable rules and regulations.

The central Government will provide an incentive of 40 paise/kWh or Rs.6.60 lakhs/MW/year, whichever is lower to the DISCOMs, for buying the power produced under this Component for a period of five years from the Commercial Operation Date of the plant.

Since these power plants will be located closer to the consumers in a decentralized manner, it will ensure availability of reliable day-time power. The solar power purchased under this component will also help the DISCOMs to meet their Renewable Energy Purchase Obligation (RPO) target.



# De-dieselisation of Farm Sector

## Component-B : Installation of Standalone Solar Powered Agriculture Pumps

Under this Component, individual farmers can replace their existing diesel pumps with solar pumps. The replacement of existing diesel pumps with solar pumps will not only reduce the irrigation costs of around Rs.50,000 per year (for 5HP pump) but also lead to reduction in the pollution. This Component will benefit 20 lakh farmers in off-grid areas, where there is no source of electric power for irrigation. It will also help in increasing the farmer's income and living conditions.



Group of farmers, such as Water User Associations and community/cluster based irrigation systems will also be covered under this component. However, priority will be given to small and marginal farmers. In order to minimize water usage for irrigation purposes, preference will be given to farmers using micro irrigation systems or covered under micro irrigation schemes. The size of the pump will be selected on the basis of the depth of the water table in the area, the area of the land to be covered under irrigation and the quantity of water required for irrigation.

Under the scheme, Central Financial Assistance (CFA) upto 30% of the Benchmark cost (fixed by MNRE every year) of the standalone solar pump will be provided. The State Government will give a subsidy of 30%; and the remaining 40% will be provided by the farmer. Bank finance up to 30% out of 40% share can be availed by the farmer, so that farmer has to initially pay only 10% of the total cost of the pump. However, in North Eastern States, Sikkim, Himachal Pradesh, Uttarakhand, Jammu & Kashmir, Ladakh, Lakshadweep and A&N Islands, higher CFA upto 50% of the benchmark cost of the standalone solar pump will be provided.

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Solar pumps of capacity higher than 7.5 HP can also be installed under the scheme, however, the CFA will be limited to that of 7.5 HP capacity solar pumps.

Since pumps are generally used for limited period, say 150 days in a year, the installed solar capacity can be utilized for remaining days by using Universal Solar Pump Controller (USPC). A USPC enables the farmer to use solar power for other activities like operating his Chaff Cutter, Floor Mill, Cold Storage, Dryer, etc. Installation of USPC is permitted under this Component.

All solar pumps installed under this Component will be provided with remote monitoring systems so that the functioning of any pump can be monitored on a real time basis. Selected vendors for installation of solar pump and panel will mandatorily provide repair & maintenance for a period of 5 years from the date of commissioning of the pump. They will have one authorized service centre in each operational district and a helpline in local language in each operational State.



# Solarisation of Agriculture Feeders

Solarisation of agriculture feeders has been included as variant under Component-C of PM-KUSUM Scheme.

Where feeders have already been separated for agricultural purposes, the feeders may be solarised under the scheme by installing solar power plants of sufficient capacity. Government of India will provide 30% subsidy for solarisation of agricultural feeders. This will lower the cost of capital and cost of power. The farmers will get day-time reliable power for irrigation free of cost or at tariff fixed by their respective state.

The requirement of total annual power for an agriculture feeder will be assessed and a solar power plant of capacity that can cater to the requirement of annual power for that agriculture feeder can be installed either through DISCOM's own expenditure (CAPEX mode) or utilising services of independent Renewable Energy Service Company (RESCO mode), which will be selected through competitive bidding and on the basis of lowest tariff offered for supply of required solar power for a period of 25 years. This would be much cheaper than present cost of power delivered at distribution sub-station. Therefore, DISCOM will save the amount equal

to difference between the two. In CAPEX mode, the annual subsidy being presently provided for supply of electricity to agriculture pumps by



State Government can be used to repay the loan in five to six years after which solar power will be available free of cost and outflow from State Government's exchequer on account of electricity subsidy for agriculture will come to an end.

For installation of feeder level solar power plant, CFA of 30% (50% in case of NE States, hilly states/ UTs and Island UTs) will be provided for CAPEX/ RESCO Mode by Central Government and balance will be met through loan from NABARD/PFC/REC.

Where agriculture feeders are not separated, loan for feeder separation may be taken from NABARD or PFC/REC. Further, assistance for feeder separation may be availed taken from the scheme of the Ministry of Power. The savings on account of electricity subsidy on agriculture and the income from the surplus electricity generated by the solar power plant when it is not being used for irrigation can be used to pay off the loan taken for feeder separation.

For water and energy conservation, the DISCOMs shall assess the average power requirement by farmers of an area depending upon pump capacity and various other factors. This power requirement will be treated as their benchmark consumption. The DISCOMs shall incentivise farmers for consuming power less than benchmark consumption. Such saving of power shall be treated as surplus power injected by farmers and they will be paid by DISCOMs against this saved power at pre-determined tariff.



# **Expected outcomes**

PM-KUSUM will bring along the following reform/ improvements:

# Day-time reliable power for irrigation

Farmers typically get power for irrigation at night. This not only causes them a great deal of inconvenience but also results in wastage of water as pumps are left running once switched on. Providing solar panels for irrigation under PM-KUSUM would result in day-time reliable power to farmers making irrigation easier for them and also avoiding over-use of water and power.

### De-Dieselization Of Farm Sector By Replacing Diesel Pumps With Solar Pumps

Farmers have been demanding replacement of diesel pumps by electric pumps as the former one is costly to run. By replacing diesel pumps



with solar pumps and panels, the farmers will get cheaper and more reliable power for irrigation resulting savings in diesel cost.

# **Enhancing Farmers' Income**

Enhancing farmers' income is one of the most important policy priorities of the Government. PM-KUSUM will serve this objective by replacing high cost diesel with less expensive solar energy under Component-B and by enabling farmers to sell surplus solar power at a pre-determined rate to DISCOMS under Component-C.

## Reducing The Agriculture Electricity Subsidy Burden on States And Improving The Financial Health of DISCOMS

The annual electric consumption of over 220 lakh grid connected agriculture pumps installed in

the country is around 213 billion units which is 18% of the total electricity consumption.





Eleven major DISCOMS of the country consume 95% of total agricultural electricity consumption of the country and annually provide over Rs. one lakh crore as electricity subsidy for agriculture. This subsidy comes from the State's exchequer. The aggregate subsidy amount on account of electricity for the agricultural needs of country has been rising over the years:



State Government subsidy on account of free/subsidised electricity for agriculture is not being paid to DISCOMs in a time bound manner. This adversely affects the financial health of DISCOMS, and leaves little room for infrastructural improvements.

# PM-KUSUM will help address this issue by

reducing subsidy required from states for electricity supply to agriculture. The annual subsidy can be used to repay the loan in five to six years after which solar power will be available free of cost and outflow from State Government's exchequer on account of electricity subsidy for agriculture will come to an end. The PM-KUSUM will also contribute to reducing transmission losses, further helping the financial health of DISCOMS.

# **Curbing Climate Change**

Nearly 80 lakh pumps out of approximately 3 crore agricultural pumps installed in India are diesel pumps. The total diesel consumption of these pumps in a year works out to 5.52 billion litre along with equivalent CO2 emission of 15.4 million tonnes. When implemented fully, PM-KUSUM will lead to reducing carbon emissions by as much as 32 million tonnes of CO2 per annum. Moreover, farmers whose diesel pumps are replaced will be able to work on their farms in a pollution free environment.

## **Boosting Domestic Solar Manufacturing**

India has set for itself very ambitious targets in RE capacity addition, particularly solar power capacity addition.Our immediate aim is to achieve 100 GW of solar power capacity by the year 2022. However, our domestic solar manufacturing capacity is limited, and we mostly depend on imports in this area. This needs to be addressed, particularly because the RE sector is strategic in nature. PM-KUSUM has a mandatory requirement for deploying domestically produced solar cells and modules under Component B and C. This will create demand of 20.8 GW for domestically produced solar cells and modules and thus give a fillip to domestic solar manufacturing.



# **Reducing The Import Bill**

India's petroleum import bill is large and has been rising:



When implemented fully, PM-KUSUM will lead to an annual reduction in diesel consumption of 1.38 billion litres per annum, thus reducing the import bill on account of petroleum products. Moreover, enhanced domestic solar manufacturing will lead to a further reduction in the outgo on account of imports.

# Soft Loan And Benefits In Conjunction With Other Government Schemes

The RBI has included all three components of the Scheme under priority sector lending and therefore banks will provide loans at competitive rates and on soft terms. Further Component-B and C provide for convergence with the schemes of Department of Agriculture, Cooperation & Farmers Welfare (DACFW), such as Agriculture Infrastructure Fund (AIF) under which loans to group of farmers are available with interest subvention of 3% for community assets used by farmers and PM-Krishi Sinchayee Yojana (KSY) under which micro irrigation systems can be obtained

### **Expansion of The PM-KUSUM Scheme**

The initially approved scheme aims to add solar capacity of 25.75 GW by 2022. The total central financial support provided under the scheme was over Rs. 34,000 Cr. In the Budget for 2020-21, expansion of the scheme was announced, which was later approved by Government with inclusion of feeder level solarisation as a new variant under Component-C. With the expansion, the targeted solar capacity addition under the scheme would be 30.8 GW as per details given below:

Component	Approved Capacity	Creation of RE Capacity Targeted (GW)	CFA Including Service Charges (Rs. Cr)
Component-A	10 GW	10	3,325
Component-B	20 lakh pumps	9.6	15,912
Component-C	15 lakh pumps	11.2	14,798
Total		30.8	34,035

Under Component-A, 36MW has been cumulatively installed in Rajasthan (21.5MW) and Himachal Pradesh (14.5MW). Approximately 1070MW of LOA have been issued by the states of Rajasthan, Himachal Pradesh, Madhya Pradesh, Haryana, Maharashtra and, Uttar Pradesh. Other States are at different stages of implementation including identification of distribution sub-stations, determination of tariff of solar power to be sold to DISCOMS, inviting applications, etc.

Under Component-B, State implementing agencies issued LoA to selected vendors for installation of over 95000 pumps. Due to COVID -19, progress was slow during the first half of 2020-21 but thereafter installation has gathered pace and, up to 31.03.2022, over 94,000 solar pumps have been reported installed in the fields.

Under Component-C, Rajasthan successfully completed solarisation of 1026 pumps and issued LoA for individual pump solarisation of around 10000 existing grid connected pumps. Gujarat has issued LOA to 4 agencies and allocated feeders for social engineering. West Bengal has issued LoA 5.25MW capacity for 700 for pumps. Other states are at different stages of implementation including identification of feeders, determination of tariff of surplus solar power to be sold to **DISCOMS.** inviting applications, etc.

Under Feeder Level Solarisation, more than 43 lakh pump demands have been received from states against the sanction capacity of 15 lakh pumps. Since demand from other states are awaited, so far, 9.25 lakh pump has been allocated to states. Rajasthan through Jaipur DISCOM has tendered for 4.24MWp capacity, Gujarat has been published for 1967 nos. of Agricultural Consumers, for 10 feeders and 8 solar plants for pilot project. Kerala has also tendered for 5.995MW capacity and completed selection of bidders by issuing 81 NTPs.

It is expected that installation of small solar plants, pumps and solarisation of feeder will gather pace during 2022-23.

# **Beneficiary Speaks**

"Government has provided me a solar pump of capacity 7.5 HP for irrigation under PM-KUSUM Scheme. I am very happy with its result by getting hassle free irrigation during day time and also saving the cost of diesel. I am doing timely irrigation of my land which will increase production. I am thankful to the Government."

### Shri Raghu Nath,

Resident of village Jai Singh wala, Block Sangat, Distt. Bhatinda "I have installed solar pump on my land under PM-KUSUM Scheme. I don't have to pay the electricity bill as the pump runs on solar energy. The pump runs 8 to 10 hours during the day and it has increased agricultural yield and revenue."

### Smt. Vijyaben Vinubhai Asodariya,

Resident of village HadmatiyaKhakhara Distt. Junagarh

"I could not afford the cost of diesel for irrigating my 1.61 ha land, and only raising pulses as rain fed crop on part of land. After installation of solar pump, I am cultivating banana and expecting a good yield. I have also installed a drip irrigation system with the solar pump."

### Shri G. Arun

Resident of village Vridhachalam in Cuddalore District, Tamil Nadu

# **PM-KUSUM in News**

# MNRE issues norms for farmers' scheme to boost solar energy

PRESS TRUST OF INDIA New Delhi, July 22

THE MINISTRY OF New and Renewable Energy (MNRE) on Monday issued guidelines for rollout of the 434,422-crore PM-KUSUM scheme, which would encourage farmers to generate solar power in their farms and use the clean energy to replace their diesel water pumps. The Pradhan Mantri Kisan

The Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM) scheme entails setting up of 25,750-MW solar capacity by 2022 with the total central financial support of ₹34,422 crore.

The Cabinet Committee on Economic Affairs (CCEA) in February approved the launch of the scheme with the objective of providing financial and water security. The scheme has three components. The Component-A provides for setting



up of 10,000 megawatt of decentralised ground/ stiltmounted grid-connected solar or other renewable energybased power plants.

The Component-B provides for installation of 17.50 lakh stand-alone solar agriculture pumps, while the Component-C envisages solarisation of 10 lakh grid-connected agriculture pumps. The guidelines issued on

The guidelines issued on Monday stated that the Component-A and Component-C will be implemented initially on a pilot mode for 1,000 megawatt (MW) capacity and one lakh grid-connected agriculture pumps, respectively, while the Component-Bwill be implemented in full-fledged manner with total central government support of €19,036.5 crore.

After the successful implementation of pilot project of Components A and C, the same shall be scaled up with necessary modifications based on the learning from the pilot phase with the total central government support of ₹15,385,5 crore, it added.

### कुसुम योजना पर अब 34,000 करोड़ रुपये की लागत

जागरण ब्यूरो, नई दिल्ली : केंद्र सरकार ने कुसुम योजना को विस्तार देते हुए इससे कुल 30,800 मेगावाट बिजली बनाने का लक्ष्य रखा है। इस योजना पर सरकार की 34,035 करोड़ रुपये की लागत आएगी। योजना के तहत अगले दो वित्त वर्षी में कुल 35 लाख किसानों को सोलर चालित पंप स्थापित करने की सुविधा दी जाएगी। इस योजना से देश डीजल-चालित सिंचाई पंपों से मुक्ति मिलेगी और किसानों को अतिरिक्त धन अर्जित करने का भी मौका मिलेगा। कुसुम योजना के तहत सोलर ऊर्जा से सिंचाई पंप चलाने वाले किसान अपनी अतिरिक्त बिजली वापस राज्यों की वितरण इकाइयों को बेच सकेंगे और अतिरिक्त कमाई कर सकेंगे। वैसे यह योजना मार्च, 2019 में ही लागू की गई थी। लेकिन केंद्र सरकार के तहत नवीन ऊर्जा मंत्रालय ने इसका विस्तार कर वित्त वर्ष 2022-23 तक पूरा करने का लक्ष्य अगले दो वित्त वर्षों में कुल 35 लाख किसानों को सोलर चालित पंप स्थापित करने की सुविधा दी जाएगी

#### रखा है।

नवीन ऊर्जा मंत्रालय की सूचना के मुताबिक पहले चरण में किसानों को दो मेगावाट तक बिजली बनाने जाएंगी। इससे कुल 10,000 मेगावाट बिजली बनाने का लक्ष्य रखा गया है और केंद्र सरकार की तरफ से 3,325 करोड़ रुपये की मदद दी जाएगी। दूसरे चरण में 20 लाख सोलर-चालित पंप लगाए जाएंगे जिससे 9,600 मेगावाट बिजली बनेगी। तीसरे चरण में 15 लाख सोलर पंप लगाए जाएंगे। केंद्र सरकार का मानना है कि कुसुम योजना किसानों की आय दोगुनी करने की दिशा में अहम दिशा निभा सकतीी है। सोलर-चालित पंप को स्थानीय ग्रिड से जोड़ा जाएगा। 🔳 नए प्रयोग 👘 प्रदेश के अन्नदाता अब बन रहे ऊर्जादाता, खेती बन रही लाभ का धंधा

सौर ऊर्जा ने दोगुना की किसानों की कमाई

#### ZCOM वियोर्टर

प्रदेश के किसान सौर ऊजा कर उपयोग कर अपने कन्मई देगुने प्रथमे कर अपने कन्मई देगुने प्रथमे न सिर्फ क्याई बार से हैं बीक्स कई तरक हैं प्रीकार पं दे रहे हैं। हाल ही में प्रदेश और केंद्र सारकर को कई वीक्साएं पाछ रहे हैं दिगके प्रकार के प्रयोग के लिए जाए इस्ट्री क्याक प्रकार के उपयोग के लिए जास्वार्थ किया को उपकारण जेंद्र अज्य गाननीकी पहरचुओं की भी वान्यकरी थी का की है।



#### दिन रात फसलों को पानी मिलने से बढ रहा उत्पादन

वेवास के बड़ी चुरलई गांव के किसान धर्मेंद्र कटारिया ने कुछ महीनों पहले अपने गांव में शोलर पैनल लगवाए हैं। धर्मेंद बलाते हे कि पहले बिजली आने जाने और कई बार लंबे रामय तक बिजली ने होने की वजह से फसलों को पानी बेने में बहुत परेशानी होती थी। इसके बाव उन्होंने 72 हजार रुपए का सोलर वैनल लगवागा जिसे अपने खेत के कुएं से जोड़ा। इसके बाद वे कसलों को विनरात पानी वे या रहे हैं। उन्होंने बताया कि पहले बिजली का बिल हर महीने 1 इजार या इससे अधिक आता था। अब बिजली का बिल नहीं लग रहा और साम भर में 12 हज़ार रुपए से अधिक की बिजली की बचल भी हो रही है। पानी की भरपूर उपलब्धत से सबसे अधिक फायदा तो फसलों को हुजा है, उत्पादन भी बढ़ गया है और समें भी सुविधा हो गई है।



### First farm-based solar power plant comes up in Rajasthan

#### SPECIAL CORRESPONDENT

JAIPUR, APRIL 02, 2021 23:31 IST UPDATED: APRIL 02, 2021 23:31 IST

#### It has capacity to produce 17 lakh units of electricity per year

The first farm-based solar power plant under the Prime Minister's Kisan Urja Suraksha Evum Utthan Mahabhiyan (KUSUM) scheme has come up in Jaipur district's Kotputli tehsil with a provision for production of 17 lakh units of electricity every year.

The 1 MW project has been established on 3.50 acres of farmland in Kotputli's Bhaloji village.

The new plant is also the first of the 623 farm-based solar power projects selected by the Rajasthan Renewable Energy Corporation Limited (RRECL) for generating 722 MW capacity in the State under the scheme's first phase.

### MNRE scales up PM-KUSUM scheme goal to 30.8 GW of solar capacity by 2022

#### OUR BUREAU New Joshi, November 9

The Ministry of New and Renewable Energy has issued an order for the scale-up and expansion of the Pradhan Mantrii Kisan Urja Suraksha evam Utthan Mahabhiyan (PM-KISSIM) Scheme. The target now is to achieve enhanced solar capacity of 30.8 gigawatt (GW) by 2022 with revised Central financial support of ₹34,035 crore.

In February 2019, the Cabinet Committee on Economic Alfairs had approves the launch of the PM-RUSUM scheme. The scheme aims providing financial and water security to farmers. The scheme had aimed to add a solar capacity of 25,750 MW by 2022. The total Central financial support then supposed to be provided under the scheme was C34,422 crore.

The scheme now consists of three components. The first is 10,000 MW of decentralised ground mounted grid connected renewable power plants up to 2 MW. The second is installation of 20 lakh (up from 17.50 lakh) stand-atone solar



Central aid for the scheme has been revised to #34,035 crore

powered agriculture pumps. The third component is solarisation of 15 lakh (up from 10 lakh) grid<onnected solar powered agriculture pumps.

