

MAKING SENSE OF KUSUM

Opportunities & challenges in delivering water
and energy security for agriculture in Tamil Nadu



Auroville Consulting

Sustainable Energy Transformation Series

Making Sense of KUSUM

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Sustainable Energy Transformation Series

ACKNOWLEDGMENT

This publication forms part of the **Sustainable Energy Transformation, Tamil Nadu** (SET-TN) series of documents and activities. SET aims to facilitate higher clean energy deployment in the State by working with all stakeholders in order to find sustainable and equitable solutions. SET is a collaborative initiative by Auroville Consulting (AVC), Citizen consumer and civic Action Group (CAG), the World Resources Institute India (WRI).

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1. BACKGROUND

WHY THIS PAPER?

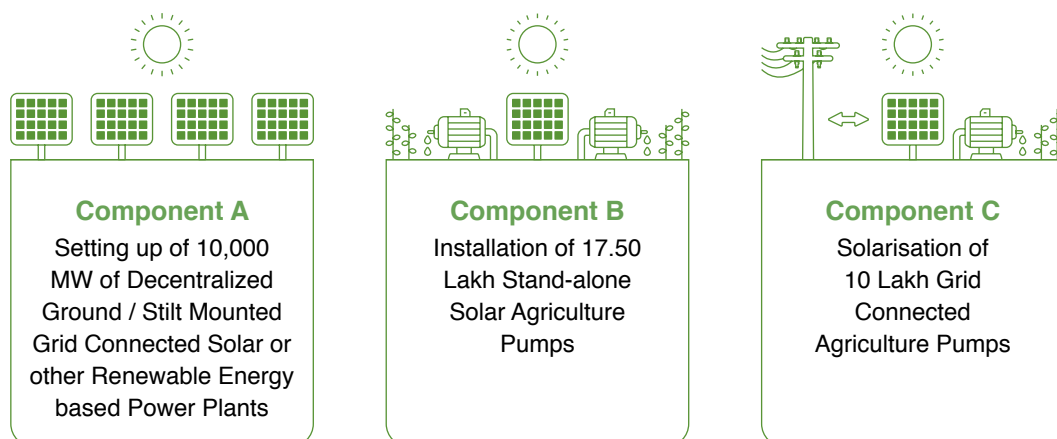
The agricultural sector in Tamil Nadu accounts for about 20% of the state's electricity consumption. Electricity supply, in the state, is free of cost to the farmers. Though the subsidy burden for the free electricity to agricultural consumers is partially shouldered by the state Government ¹, the primarily subsidy burden rests with the state-owned electricity utility, Tamil Nadu Generation and Distribution Corporation (TANGEDCO).

To compensate for the revenue loss for electricity supply to the agricultural sector, and to other subsidy consumer categories such as the domestic consumers, TANGEDCO levies higher tariffs on other electricity consumer categories such as the commercial and industrial ones.

With the rapid cost decline of renewable energy over the last decade, an electricity market reform (Electricity Act of 2003) and the advent of rooftop solar, procuring electricity from the distribution companies (Discoms) increasingly becomes a less attractive option for the commercial and industrial consumers (C&I), and the high end residential consumers. There is a trend of C&I consumers migrating to alternative options such as procuring electricity via the open access mechanism or by transitioning, to the extent possible, to captive (rooftop) solar energy. With the threat of an increasing migration of high paying electricity consumers towards more affordable alternatives, TANGEDCO is faced with the challenge of keeping up the subsidized power supply to the agricultural and domestic sector, and this in the face of dwindling revenue. To make things worse, electricity consumer prices have not been revised on an annual basis. The last tariff revision, in Tamil Nadu, was in the financial year 2017. Consumer tariffs determined in 2016-17 are still applicable today, in 2019. As the cost of electricity supply has increased and no increase of consumer tariffs took place, TANGEDCO's financial health is substantially affected.

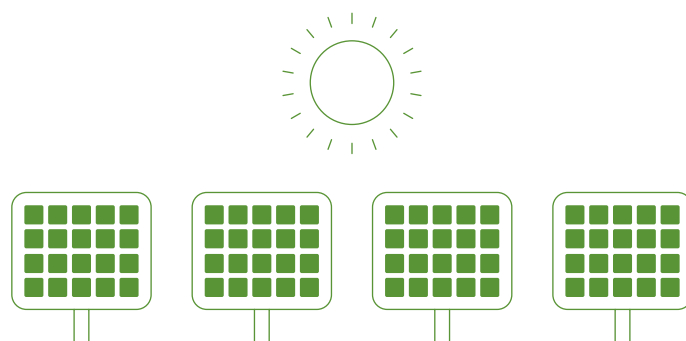
1) TANGEDCO receives a subsidy of INR 2,850 for each HP of sanctioned agricultural pump load. In the financial year 2017-2018, this subsidy amount accounted for INR Core 3,432. With an estimated electricity consumption for the agricultural sector of 12,544 MU (Approved sales figure from TANGEDCO as per Tariff order 2017) and an average cost of supply in the same year. The total cost of electricity supply to agriculture amounts to 9,671.42 INR CRORES (as per the ACOS Calculated from P&L Balance sheet for 2017-18 which is 7.71 INR/kWh). The subsidy by the state Government makes up for 35.480% percent of this cost, the remaining cost is being shouldered by TANGEDCO.

In July 2019, the Ministry of New and Renewable Energy (MNRE) released the guidelines for its new flagship program ‘Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan’ (KUSUM)². KUSUM is presented as a scheme that primarily aims at benefiting farmers. The scheme has the following three components.



This report aims at delivering a cost-benefit analysis of KUSUM Component A and B and possible alternatives, taking all major stakeholders - the DISCOM, the generator, the farmer and the state Government – into consideration. Component B is not scope the analysis, as this report focuses on the grid-connected component of Kusum. The analysis is being done in the context of Tamil Nadu, but may be relevant for the majority of the other Indian states. The proposed alternatives attempt to build upon the strength of the KUSUM approach by introducing selected modifications in the scheme in order to better bring out its full potential.

2) Ministry of New and Renewable Energy (MNRE). 2019. Guidelines for Implementations of Pradhan Mantri Kisan Urja Suraksha evam Uttham Mahabhiyan Scheme. F.No. 32/645/2017-SPV Division. Accessed under: <https://mnre.gov.in/sites/default/files/webform/notices/KUSUMguidelines.pdf>



KUSUM COMPONENT A

Setting up of 10,000 MW of Decentralized Ground/Stilt Mounted Grid Connected Solar or other Renewable Energy based Power Plants



2.1 PROPOSED

Component A aims at the promotion of distributed renewable energy generation (DREG) in the capacity range of 500 kW to 2 MW. The scheme also provides flexibility to allow DREG smaller than 500 kW. Though the focus is on distributed solar, other renewable generation technologies are permitted as well. According to the guidelines, KUSUM Component A is expected to result in savings on transmission system requirement and in a reduction of transmission and distribution (T&D) losses.

Financing of the DREG under Component A is primarily envisioned by individual farmers, group of farmers, cooperatives, panchayats, Farmer Producer Organisations (FPO), and Water User Associations (WUA).

The guidelines also mention that the DISCOM or other private entities may take up the development of DREG. A procurement based incentive (PBI) of 0.40 INR/kWh or INR 6.60 lakhs/MW/year, whichever is lower, has been introduced. This PBI will be disbursed by the Ministry of Power to the DISCOM for a five-year period.

A sample power purchase agreement in the annexure of the KUSUM guidelines, introduces A generation compensation in the case of grid back-down. It distinguishes between generation compensation for

- (i) Offtake constraints and
- (ii) Generation compensation due to back-down.

Each is differently determined.

'Generation compensation for off-take constraints compensates for the revenue loss of the generator due to temporary transmission unavailability. It is being calculated as:

(Average Generation per hour during the Contract Year) × (Number of hours of grid unavailability during the Contract Year)]

To compensate the generator for the revenue loss on account of 'off-take constraints', the guideline suggests that the DISCOM will procure excess generation (beyond the forecasting estimate) equal to the generation loss occurred at the power purchase agreement (PPA) tariff in the succeeding 3 years.³

Offtake constraints due to back-down is proposed to be compensated based on the following formula:

Minimum Generation Compensation =
50% of [(Average Generation per hour during the month) × (Number of back-down hours during the month)] × PPA tariff

However, the generator is not eligible for compensation in case the back-down is on account of events impacting grid security or the safety of any equipment, personnel or other such conditions.

A designated state entity will facilitate access to financing, application and competitive bidding processes and the development of the DPRs. The scheme proposes a competitive bidding where the pre-fixed levelised tariff will be the ceiling tariff for bidding.

Waste land shall be used for the solar projects. However, the guidelines suggest, that in case fertile agricultural land is being developed for solar energy generation, then co-location of crop and solar energy generation should be done.

This requires elevated mounting structures and appropriate spacing between the solar modules to allow sufficient sunlight to penetrate to the ground for the crops to grow

3) As per TNERC Forecasting, Scheduling and Deviation Settlement for Solar and Wind generation regulations, 2017 the following deviation settlement applies: At Rs. 0.25 per unit for the shortfall or excess beyond 10% and upto 20% +Rs. 0.5 per unit for the shortfall or excess beyond 20% and up to 30% + Rs. 1.00 per unit for the balance energy beyond 30%



2.2 CRITIQUE

The promotion of distributed renewable energy generation (DREG), solar and other renewables, is a welcome move. Equally so is the flexibility given to the states in implementing this scheme. The procurement based incentive (PBI) for 5 years may set the right signals to the DISCOM in actively promoting this scheme.

Insisting on a dedicated evacuation infrastructure (e.g. a dedicated feeder) for the DREG, however, is a counterproductive move. One key advantage of DREG is the fact that production and consumption of electricity occur at the same location, or in close vicinity to each other, thereby reducing T&D losses and optimizing the utilization of existing electrical distribution infrastructure. The requirement for a dedicated feeder for evacuation of electricity generated by the DREG results in unnecessary infrastructure costs and occupies valuable DISCOM substation bays.

There will be many cases where there is no space for the installation of one or more additional feeder bays.

A highly relevant introduction is the proposed 'generation compensation'. Unfortunately, the actual proposed design of the compensation mechanisms is rather convoluted and complex. Generators should simply be compensated for the deemed generation loss at the fixed tariffs as per the PPA. Transmission planning is in the hands of the DISCOMs, who will have to ensure that transmission expansion and capacity addition are well planned and integrated. The DISCOM shall not permit interconnection of DREG at a specific grid node in the first place, if transmission congestion can be expected. Making data about current transmission constraints and future expansion plans available in the public domain to Independent Power Producers (IPPs) would be a much needed service.

In the case of backing down generators due to transmission constraints, the generators shall be fully compensated for their losses. Equally so with the back-down due to off-take constraints.

It is the responsibility for the grid operator to ensure uninterrupted grid-availability. Generators need to be compensated for 100% of their deemed generation losses due to grid back-down.

A certain percentage of grid back-down maybe factored into the tariff itself. Instead of assuming a 100% grid availability in the tariff determination, a 97% grid availability can be assumed. This would take care of grid back-down due to monthly maintenance shut-downs and safety concerns. Additional hours of back-down (beyond the 97%) should be fully compensated for as deemed generation at the tariff as per PPA.

The scheme proposes that individual farmers, groups of farmers, cooperatives, panchayats, Farmer Producer Organisations (FPO), and Water User Associations (WUA) become renewable energy producers. Despite the proposed support by a designated state agency to facilitate access to finances and provide techno-commercial services, it is rather doubtful that the proposed target group has the necessary cash equity available to invest into energy generators and the technical and administrative capacity. It also remains to be seen, whether financing institutions are willing to provide debt on a project financing basis, especially to individual the farmers. Considering that DISCOMS have a history of delaying payments to independent power producers - as per June 2019 this was in the tune of 53,790 INR Crores⁴ - the perceived risk in relation to the possible return on investment (refer to Table 1), for both, the bank and the farmers, maybe too high to invest into KUSUM C.

4) Ministry of Power. <https://www.praapti.in>

As per the solar tariff order by the Tamil Nadu Regulatory Commission, the solar energy tariff for the year 2019-20 has been determined at INR 3.04 per kWh. This solar tariff of INR 3.04 per kWh will be the ceiling tariff for the proposed competitive bidding. The TNERC solar tariff order considers a capital cost of INR 3,35,000,000 per MW of solar

As the capital cost of smaller renewable generators is typically higher than the capital cost of larger systems, and considering the fact that the compensation mechanism for losses due to off-take are not covering the actual costs of generation, KUSUM Component A may not attract any participation

It is financially not feasible for the generators. Recent competitive biddings from 750 MW of its solar feeder program in Maharashtra had an upper ceiling tariff of INR 3.25 per kWh, however due to lack of response, retendering will have to be done.

A per kW solar capacity cost-benefit analysis undertaken, on the basis of the assumptions that were used by TNERC in their Solar Tariff order 2019 and changing three of these assumptions, indicates a post-tax internal rate of return (IRR) of 7% (refer to Table 1) for the renewable energy generator and an actual loss of 20% on the discounted cumulative cash flow (NPV) over a 25-year time period.

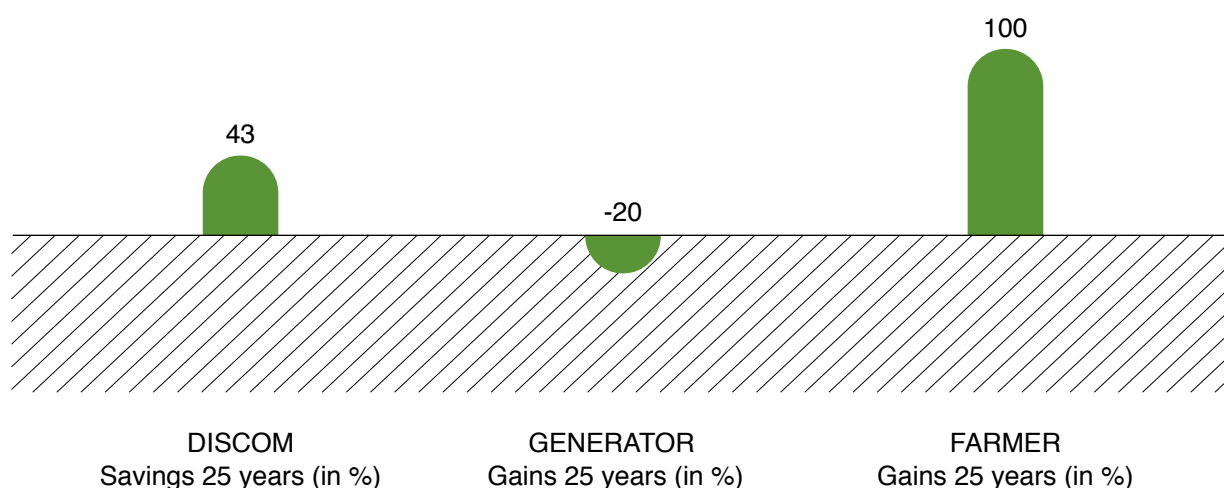
In the proposed alternative the following assumptions are modified:

(i) instead of a 100% grid-availability, a 97% grid-availability was assumed, (ii) a 1% of annual electricity generation decrease on account of solar panel degradation was introduced and (iii) the capital cost per MW solar capacity was increased by a 5% from INR 33,500,000 to INR 35,175,000. KUSUM Component A may simply fail due to the fact that the financials do not work out.

The scheme in its current design primarily benefits the DISCOM and the farmers with available non-agricultural land to lease next to a substation. The generators - whether they are individual farmers, groups of farmers, cooperatives, panchayats, Farmer Producer Organisations (FPO), Water User Associations (WUA) or independent power producers however, are unlikely to come forward and make investments.

The recommendation that only waste-land shall be taken for project development is well appreciated. The guidelines also open-up the possibility of using agricultural land under the conditions that the solar plant will be erected on stilts (e.g. on an elevated structure) and that enough spacing between the solar modules is required to allow the co-location of crop production and solar energy production. Overall, such an approach will result in additional costs, and as it is a new approach, with little research and piloting, one would do well in initiating R&D projects, that would develop the techno-commercial know-how for such an approach, before commencing a commercial roll-out.

Figure 1 Cost-Benefit Analysis per kW solar capacity by Stakeholder / Kusum Component A



5) TNERC. 2019. Order on generic tariff for Solar power and related issues. Order No. 5 of 2019 dated 29 -03-2019. Accessed from: <http://www.tnecr.gov.in/orders/Tariff%20Order%202009/2019/Solar-5-29-03-2019.pdf>

6) Mericom India. Maharashtra Retenders 750 MW of Solar for Agricultural Feeders Due to Lack of Response <https://mercomindia.com/maharashtra-ag-feeder-solar-retender/>

7) TNERC. 2019. Order on generic tariff for Solar power and related issues. Order No. 5 of 2019 dated 29 -03-2019. Accessed from: <http://www.tnecr.gov.in/orders/Tariff%20Order%202009/2019/Solar-5-29-03-2019.pdf>



2.3 ALTERNATIVE

Permitting the interconnection of any DREG at the high-tension (HT) and the low-tension (LT) distribution network, as it is a common practices in many other countries, is recommended. DREG should be incentivized to connect at the HT and LT side of the distribution transformer.

Suitable interconnection points may be determined by the DISCOM based on load characteristics and distribution network capacity. Feeder and distribution transformer metering, if non-existent, could be introduced by the DISCOM simultaneously with the deployment of Component A. Interconnecting the DREG at the existing distribution network avoids capital expenses for a dedicated feeder, it benefits the DISCOM as it avoids an unnecessary occupation of substations bays, reduces transmission and distribution losses and results in a load reduction upstream from the point of interconnection, which in turn may not require upgrading the transmission and distribution infrastructure.

The locational value of distributed generation, in particularly the avoidance of transmission (and distribution) losses, may be priced and used to provide an incentive to the generator.

The DISCOM and the generator may share the savings on transmission (and distribution losses).

With an Average Power Purchase (APP) cost of INR 5.65 and an average transmission loss of 8%, the locational value of the DREG can be priced at INR 0.45 per kWh. This locational value advantage can be shared 50-50 with the generator, resulting in an incentive of INR 0.23 per kWh for the generator (refer to Table 3). This locational incentive could make the scheme successful. Compared to an IRR for the generator of 7% as per the suggested approach under KUSUM guidelines, the proposed alternative with the locational value of solar increases the IRR to a 10%. And there is a cumulative cash flow gain of 22% instead of a loss of 20%. Whereas the gains to the DISCOM show a moderate reduction from 43% gains to a 39%. The state implementation agency may take on a proactive role in supporting individual farmers and others in the bidding process (bulk procurement) for the entire allocated target under KUSUM Component A - it could identify the land, facilitate the grid-interconnection application, prepare the PPAs and ensure timely payment by the DISCOM. It could also facilitate the availability of low cost financing. As for the co-location of solar energy and agriculture, it is recommended that pilot projects are undertaken before large deployment if this approach is undertaken.

Figure 2 Cost Benefit Analysis per kW solar capacity by stakeholder / Alternative to KUSUM Component A

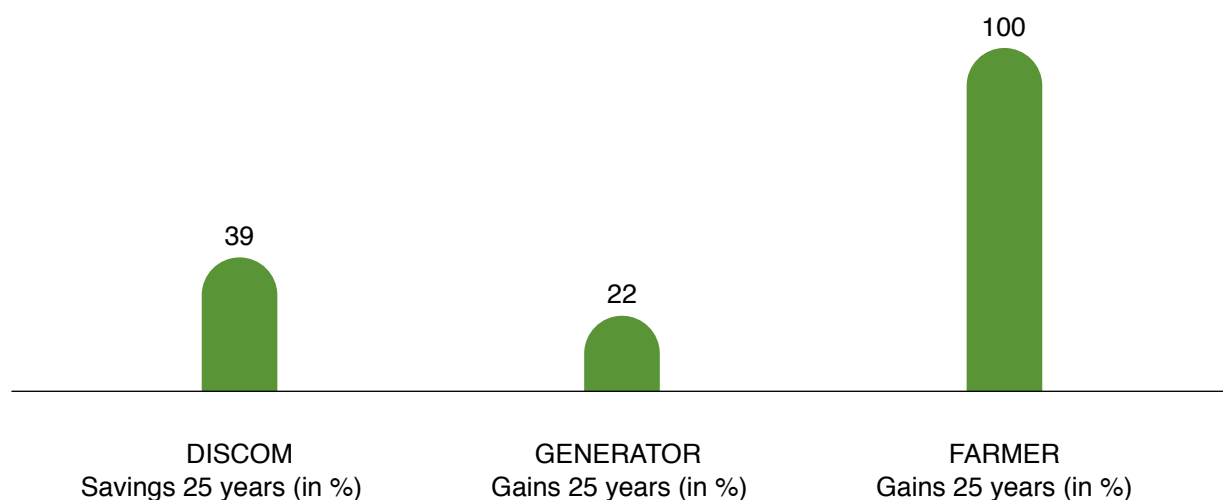
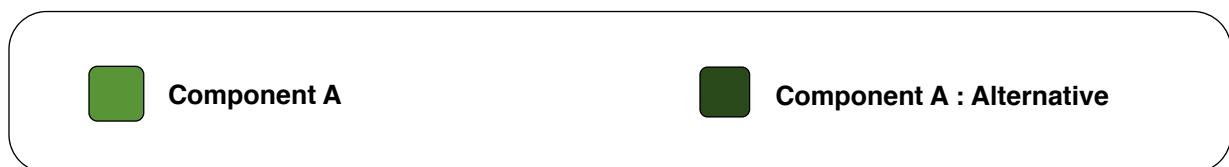
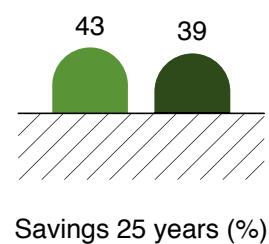
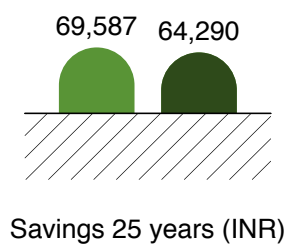


Table 1 Cost-Benefit Analysis per kW solar capacity by Stakeholder - KUSUM Component A



DISCOM⁹



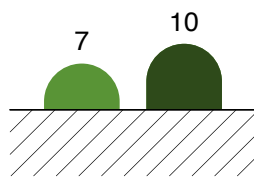
STATE GOVERNMENT¹⁰



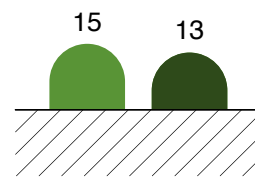
9) Discounted Savings (NPV) on account of reduction in cost of electricity supply

10) Discounted savings (NPV) on account of subsidy reduction

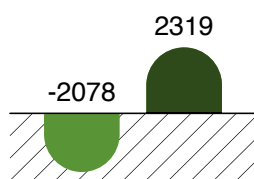
GENERATOR¹¹



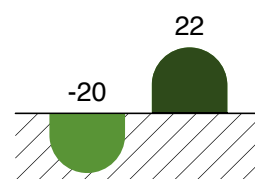
Post Tax IRR



Payback

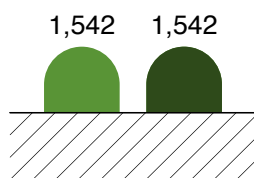


Gains 25 years (INR)

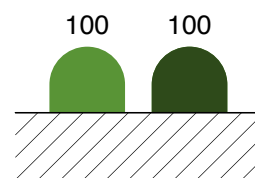


Gains 25 years (%)

FARMER¹²



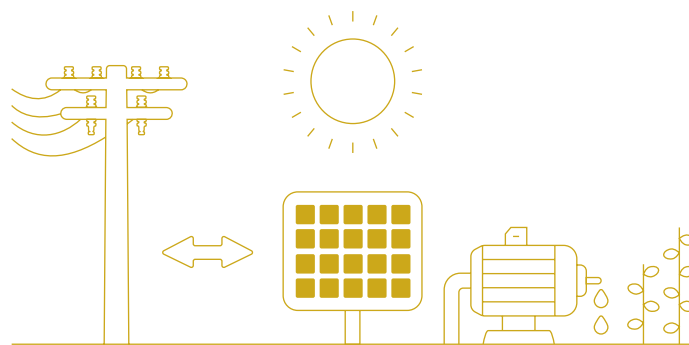
Gains 25 years (INR)



Gains 25 years (%)

11) Discounted cumulative cash flow gain/loss

12) Discounted cumulative cash flow gain on account of lease of land to generator



KUSUM COMPONENT C

Solarisation of 10 Lakh Grid Connected Agriculture Pumps



3.1 PROPOSED

KUSUM Component C promotes grid-connected solar for agricultural service connections (behind-the-meter). The guidelines recommend to size the solar system at twice the pump's capacity in horsepower (HP). Lower solar capacity is permitted as long as the solar capacity in kW does not fall below the pump capacity in HP. The farmer will utilize the solar energy generated to meet the electricity required for irrigation needs and the solar energy surplus is injected into the grid.

The guidelines for KUSUM Component C provide flexibility to introduce net-metering - where the farmer may also draw electricity from the grid, if and when required - or to limit the pump operation to electricity drawn from solar generator only. DISCOMs will purchase excess power from the farmer at the rate decided by the respective state.

States may also formulate state specific policies for grid connected solar pumps, customised to the specific needs of the respective State, as long as the broader framework provided by MNRE are kept in mind. Feeder-wise implementation is recommended.

States can set a minimum target of pumps to be solarized per feeder. Feeders under KUSUM C will have a 'must-run status, to provide uninterrupted daytime (sunshine hours of a day) power supply.

The central financial assistance (CFA), a 30% capital subsidy, is limited for pumps of up to 7.5 HP. Pumps with a higher capacity are permitted; however, the maximum capital subsidy will be limited to the subsidy applicable for 7.5 HP pumps. In addition to the subsidy provided by the Central Government, the state Government is required to support the scheme with a 30% subsidy share. The remaining 40% of capital cost is expected to come from the farmer via a 10% equity and a 30% debt financing.

The priority is set on small and marginal farmers. The guideline also recommends to give priority to farmers already using micro-irrigation systems or those that are about to adapt micro-irrigation in order to minimize water usage and energy consumption for irrigation.

Possibilities would be explored by implementing agencies for convergence of KUSUM Component C with schemes on promotion of micro-irrigation system and replacement of agriculture pumps with energy efficient pumps. The modality for coordinating with respective Ministries/Departments will have to be worked out by the implementation agency.

There is a domestic content requirement for the solar system components under the KUSUM C Component. A remote system performance monitoring has been mandated.



3.2 CRITIQUE

As electricity is free of cost for the agricultural consumers, the suggested financing model (with a 40% contribution by the farmer) are unlikely to work. The farmer simply has no incentive to invest into solar energy generation, despite the high capital subsidy that is provided.

In the context of the net feed-in mechanisms of Tamil Nadu and the tariff as per TNERC order for net-feed in of INR 2.28 per kWh, the farmer's IRR would be -19% over a 25-year time period (refer to Table 2). The only possible benefit for the farmer here is a reliable day-time 3-phase power supply, if that is made part of the scheme implementation. The current design on KUSUM C primarily benefits the DISCOMS and appears to not be attractive to the farmer

In the case of Tamil Nadu, the State Government would have to shoulder an additional capital outlay on top of the currently provided subsidy of INR 2,850/year per connected HP, for the 30% capital subsidy for the solar system provided to the farmer without any direct gains from the scheme.

The scheme justifies the re-introduction of electrical service connection meters for participating farmers. This is expected to help

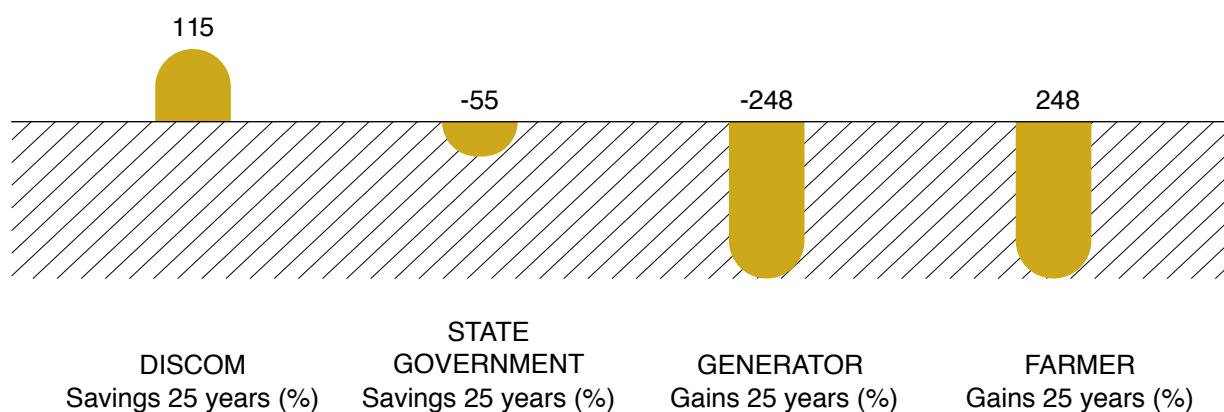
the DISCOM and the state greatly in getting a better grip on the actual electricity consumption that can be attributed for the agricultural sector.

A challenge for KUSUM Component C may be the insistence on domestic content requirement for the solar cells, solar modules and the balance of the system. There is uncertainty on whether the local manufacturing capacity is sufficient to deliver the required solar cells, solar modules, balance of system etc. in order to meet the KUSUM targets. The domestic content requirement will defer access to low interest capital from international development banks., and may risk a lawsuit by the World Trade Organization

The attempt to converge KUSUM with ongoing micro-irrigation and efficient pumps schemes presents a great opportunity to improve water and energy efficiency. However, the guidelines are silent on how this will be achieved, and there may be a great risk that the proposed convergence will be ignored altogether

This presents a severe risk factor in further increasing ground water extraction on account of agriculture and accelerating the dire water shortage in many parts of the country.

Figure 3 Cost-Benefit Analysis per kW solar capacity by Stakeholder / KUSUM Component C



Note: Under KUSUM Component C the farmer and the generator are identical.



3.3 ALTERNATIVE

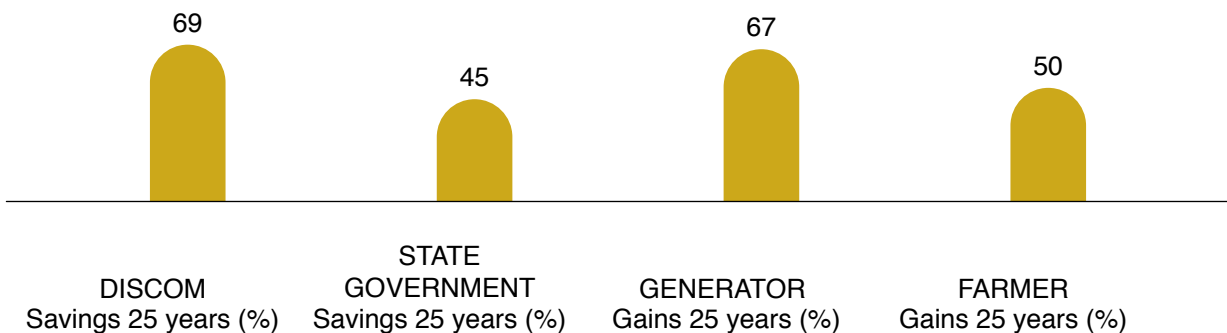
Alternatively, a third party may invest into the solar system and sell the gross-generated solar energy to the DISCOM. In order to make this approach acceptable to the farmer, a 'solar farmer incentive' designed to motivate the farmer to reduce its water and electricity consumption can be introduced

Such an incentive may further be enhanced by adding a time-of-use (ToU) component. Such an incentive maybe be designed as:

$$(\text{Net solar export} \times \text{Solar energy export credit factors}) - (\text{Grid energy import} \times \text{Grid import debit factor})$$

out the subsidy disbursement to the DISCOM for the farmers participating under KUSUM Component C. This approach promises to create a stronger incentive for the State to commit to the 30% capital subsidy requirement. The convergence of KUSUM with micro-irrigation schemes and efficient pump schemes will require inter-departmental coordination within the State Government. It is highly desirable that drip irrigation, where possible, will be mandated for farmers participating under KUSUM Component A.

Figure 4 Cost-Benefit Analysis per kW solar capacity by Stakeholder / Alternative to KUSUM Component C



Examples of ToU export credit and import debit factors:

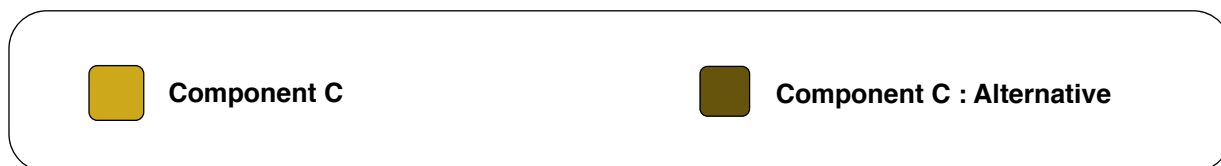
- 1) Solar energy export credit factor during low demand: 1.00 INR/kWh
- 2) Solar energy export factor during high demand: 1.50 INR/kWh
- 3) Grid energy import factor during low demand: 1.00 INR/kWh
- 4) Grid energy import factor during high demand: 1.50 INR/kWh

In return for providing a 30% capital subsidy, the State Government may benefit from phasing

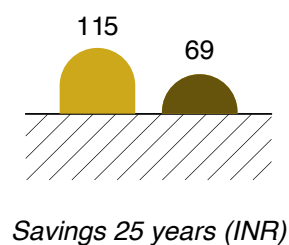
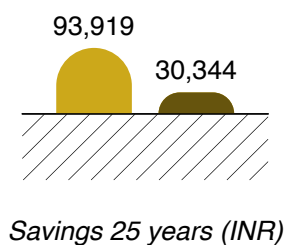
The introduction of advanced irrigation control systems, that delivers climate based and crop specific irrigation schedules along with the micro-irrigation should be considered. Such advanced irrigation control systems can be programmed in tune with the proposed time-of-use tariff

This will optimize the farmer's income from the proposed solar farmer incentive, contribute to an advanced demand response program of the DISCOM and possibly also increase the crop yield of participating farmers. Mandating advanced inverter functions under this scheme presents another opportunity. This would greatly benefit grid operations.

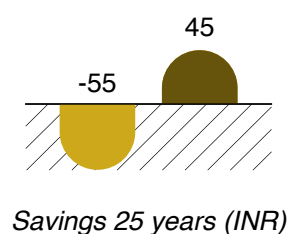
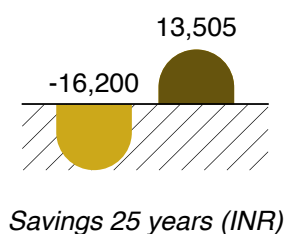
Table 2 Cost-Benefit Analysis per kW solar capacity KUSUM C and proposed alternative



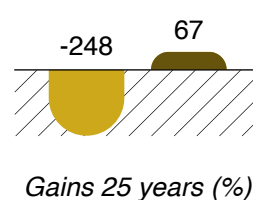
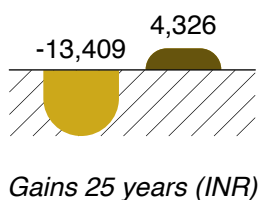
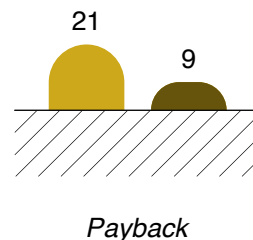
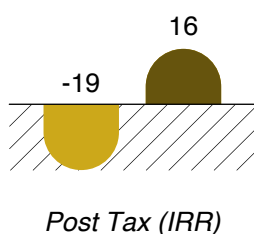
DISCOM⁹



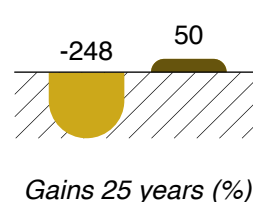
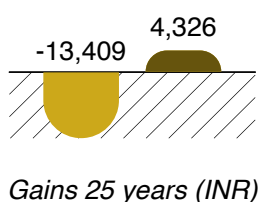
STATE GOVERNMENT¹⁰



GENERATOR¹¹



FARMER¹²



SUMMARY AND CONCLUSION

While KUSUM presents a healthy initiative in turning the challenges related to free or subsidised electricity supply into an opportunity towards water and energy security, the current guidelines appear to be rushed and not well-thought out.

Some elements in the guidelines, such as the insistence on a dedicated feeder, the tariff setting for competitive bidding and compensation for power back-out in Component A, or in the case of Component C the investment recovery model for the farmer and the lack of strategy for interdepartmental coordination to ensure that water conservation technologies are fully integrated, are risk factors and gaps that may not allow the scheme to deliver on what it has promised to do.

What KUSUM promised to deliver is: an income increase and reliable day-time power supply for the farmers, the promotion of DREG, the reduction in the cost of supply and the reduction in transmission and distribution losses. Though it will be finally the responsibility of the various states to design and implement state specific implementation models, these gaps may need to be addressed at the central level.





With some specific modifications to the proposed KUSUM Components A & C, these can be turned into workable and scalable solutions. Table 3 below compares KUSUM Component A and C with its suggested alternatives

Though the proposed alternatives provide a slightly lesser revenue gains to Discoms, they make the schemes viable in providing shared benefits to all stakeholders. KUSUM A & C, as formulated in the guidelines, run the risk of not taking off due to multiple program constraints such as the domestic content requirement, insufficient rate of return to the generators and farmers. A moderately reduced revenue gain for the Discoms greatly increases the chances for the program to succeed. A program that is not implemented does not benefit anyone.

As per the cost benefit analysis in the table 3 and 4 below, the suggested alternatives to KUSUM Components A and C promise a well- rounded approach that delivers benefits to all stakeholders. The suggested alternative to KUSUM Component C requires a longer gestation time, as smaller systems take more time for implementation but overall this alternative delivers the most promising results.

Kusum fails to address the interlinkages between water, energy, land and livelihood. Especially the lack of a coherent approach to address over-extraction of ground water resources by the agricultural sector remains a big concern. No attempt for an interdepartmental approach was undertaken. Additionally the introduction of a life-cycle approach, that ensures proper disposal and recycling of the solar equipment is lacking.

Table 3 Comparison of KUSUM Schemes A, C and possible alternatives

IMPACT	COMPONENTS			
	A	A Alternative	C	C Alternative
Solar Tariff (INR/ KWh)	 3.04	 3.10	 2.28 ¹⁴	 3.32 ¹⁵
Locational Value of Solar (INR/ KWh)	×	0.23	×	×
Metering Introduced	×	×	✓	✓
Farmer Incentive	×	×	×	✓
Reduction in State Subsidy	×	×	×	✓
O & M	 low	 low	 medium	 medium
Speed of Deployment	 high	 high	 medium	 medium
Reliable Daytime Power Supply to Farmer	✓	✓	✓	✓
Dedicated Evacuation Infrastructure Required	✓	×	×	×
Ownership	Developer, Farmer, etc	Developer, Farmer, etc	Farmer	RESCO

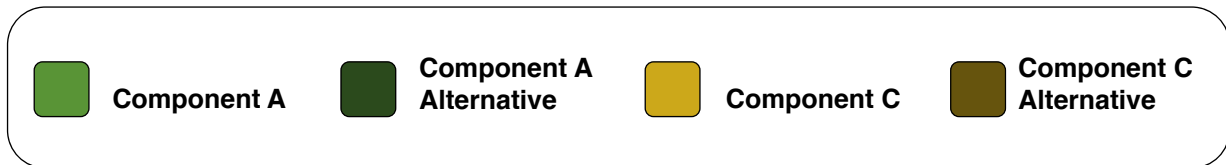
14) Solar Net feed-in tariffs as per TNERC (Order on generic tariff for Solar power and related issues.)

15) Proposed gross feed-in tariff for RESCO with the 60% capital subsidy under KUSUM Component C

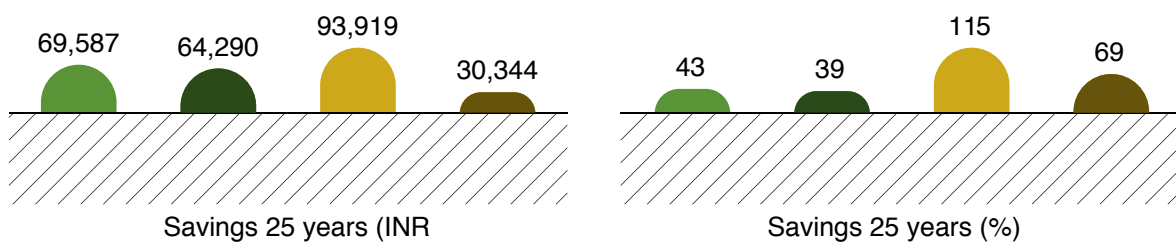
Notes: Under Component C the Generator and Farmer are the same entity.

OVERVIEW

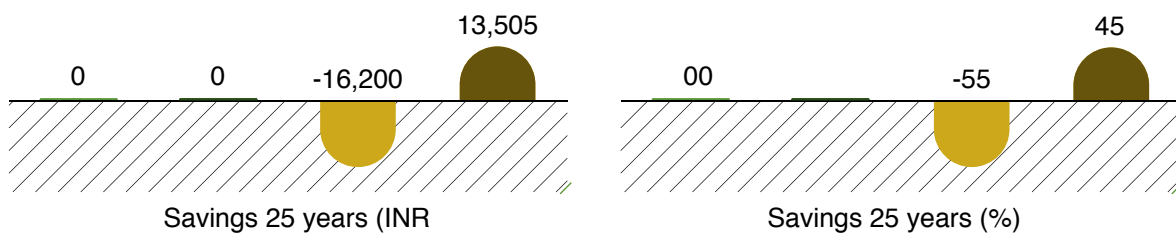
Table 4 Cost-Benefit Analysis for various stakeholders per kW Solar



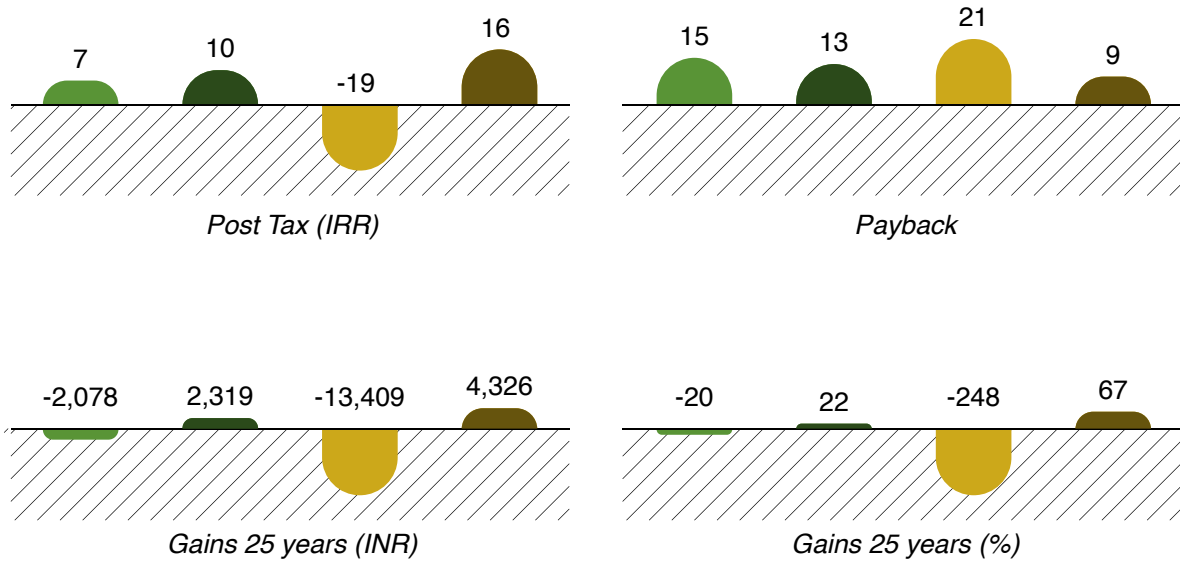
DISCOM⁹



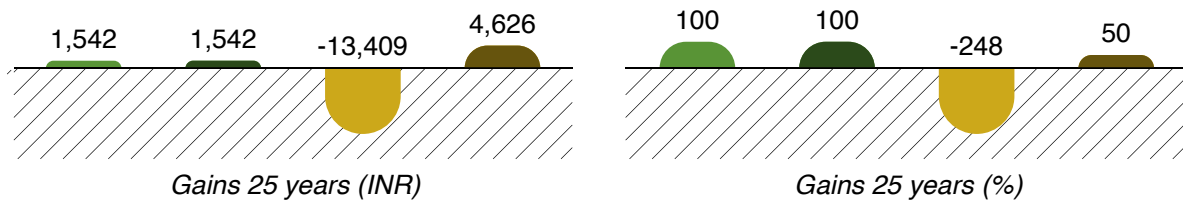
STATE GOVERNMENT¹⁰



GENERATOR¹¹



FARMER¹²



Notes: Under Component C the Generator and Farmer are the same entity.

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