Overcoming key challenges faced by states in the implementation of Components A & C(FLS)

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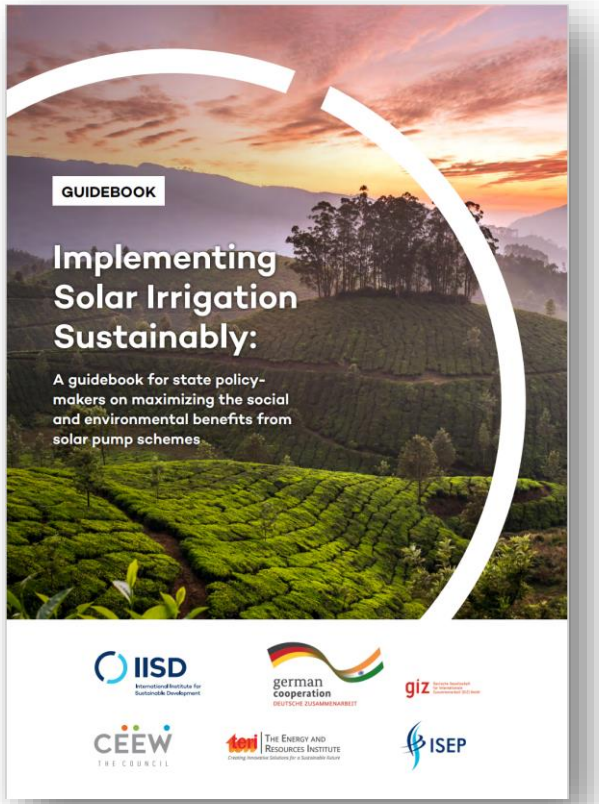
Guidebook on PM-KUSUM

Phase- I

Solar pumps

PM-KUSUM Components B & C(IPS)



Phase- II

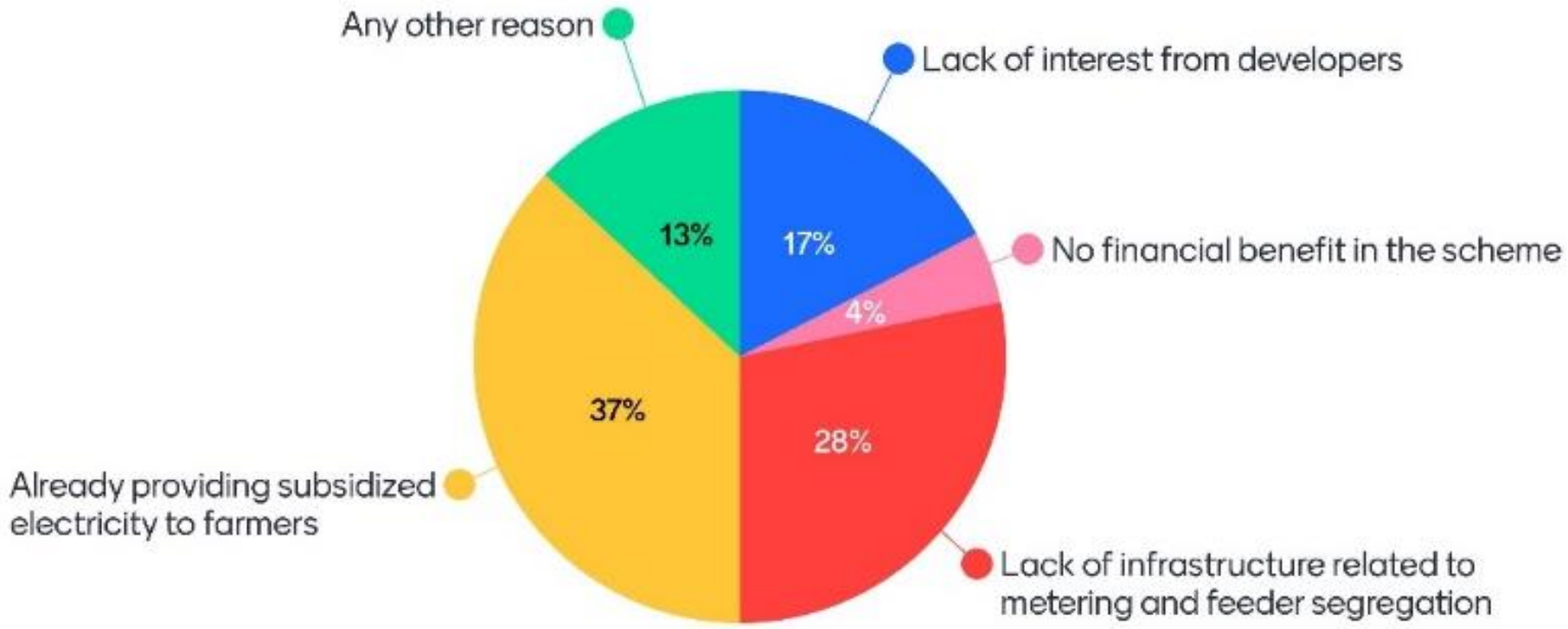
Solar feeders

PM-KUSUM Components A & C (FLS)

Under development

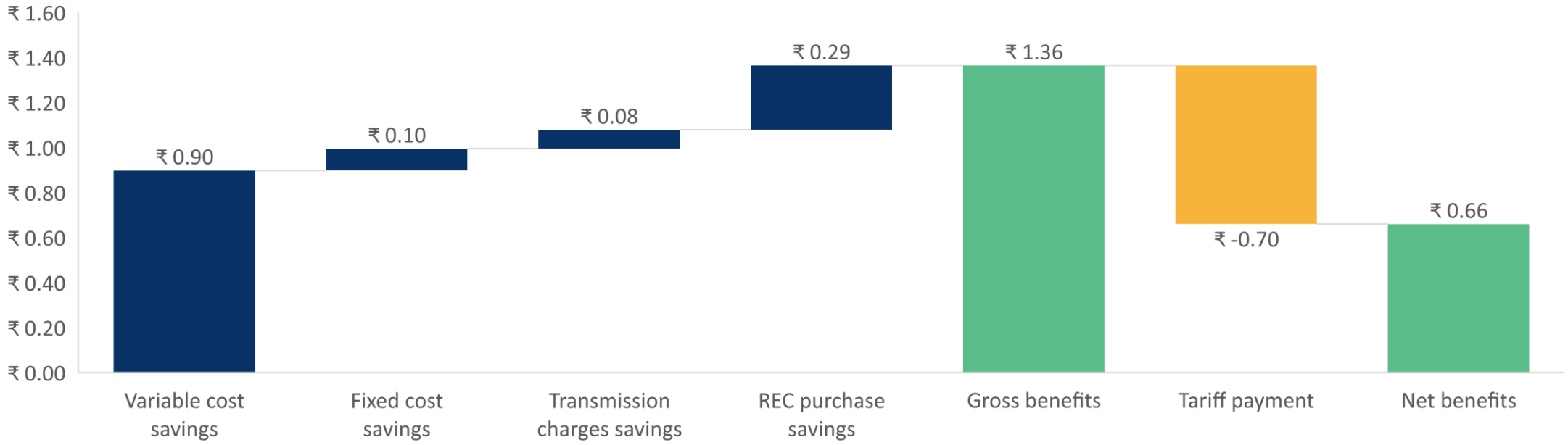
Interesting insights from the previous survey

What is your state's primary constraint in implementing Component C (FLS)



Is there a financial benefit for the state in Component C?

Component C (FLS) offers significant benefits to states irrespective of their current power supply to agriculture



Source: CEEW (2021) – cost-benefit analysis of Component-C for a discom in Karnataka. A 20% tariff reduction is assumed due to 30% CFA

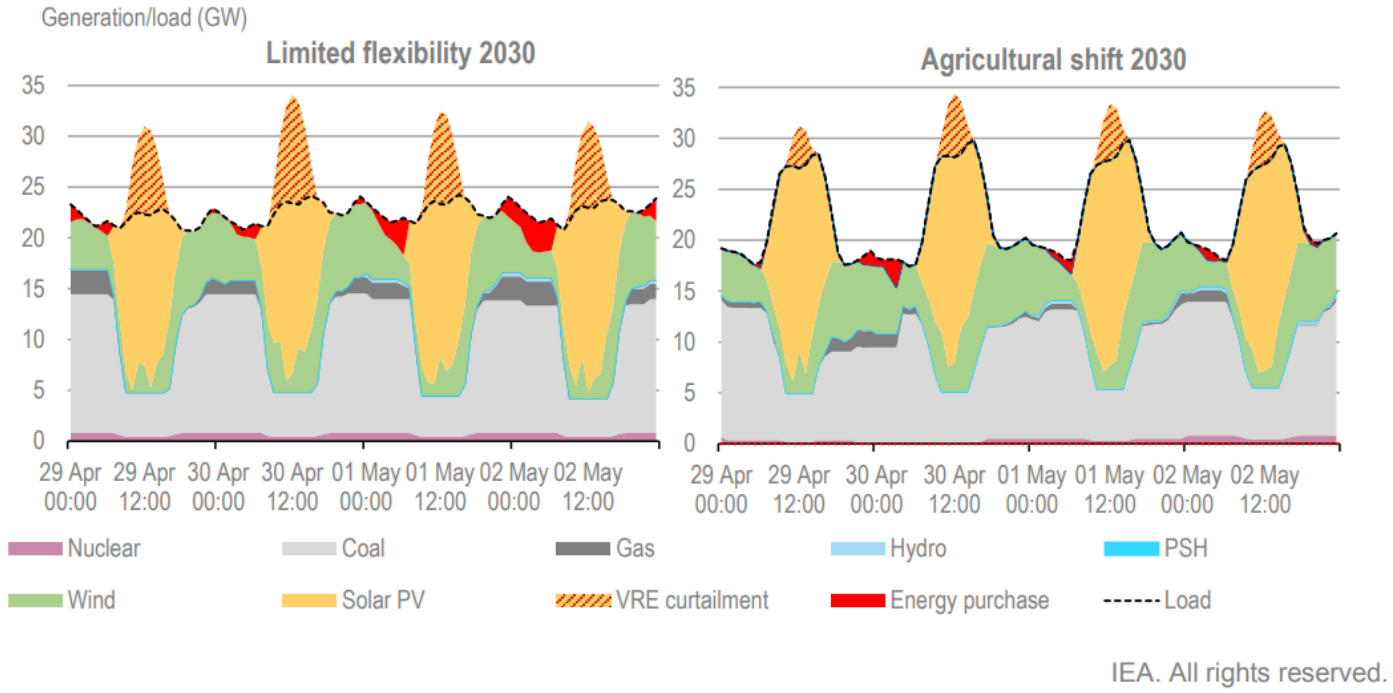
But what about other key concerns…?

Our analysis shows that several concerns of states can be resolved

Peak load management

"we regulate supply to agriculture for managing peak? Wouldn't load management be affected by the shift in power supply"

When the share of solar power increases in the energy mix, shifting agriculture load to daytime would be the most cost-effective strategy for managing load.



Source: IEA, Gujarat State Model and analysis based on Khanna (2021).

States like Karnataka has shifted agriculture power supply to daytime to manage the high solar share

"our distribution infrastructure does not have enough segregated feeders nor is robust enough to handle such large-scale distributed RE integration? "

Quality of distribution infrastructure

Feeder segregation is not a pre-condition for Component C (FLS)

In states where feeder segregation does not make economic sense, it is not a precondition to do so.

Virtual segregation is a cost-effective alternative

Virtual segregation using IoT tech offers a cost-effective alternative to physical segregations

- 90% cost savings
- Existing transformers can be retrofitted

PMKUSUM-RDSS convergence is an opportunity

Under RDSS scheme states can access funds for upgrading distribution infrastructure offering an excellent opportunity for convergence

- Bifurcation of overloaded feeders
- Segregation of feeders
- Installing capacitor banks for power factor correction

"our agriculture power consumption is very seasonal. Wouldn't solarization lead to upstream flow and congestion and losses in non-irrigation seasons?"

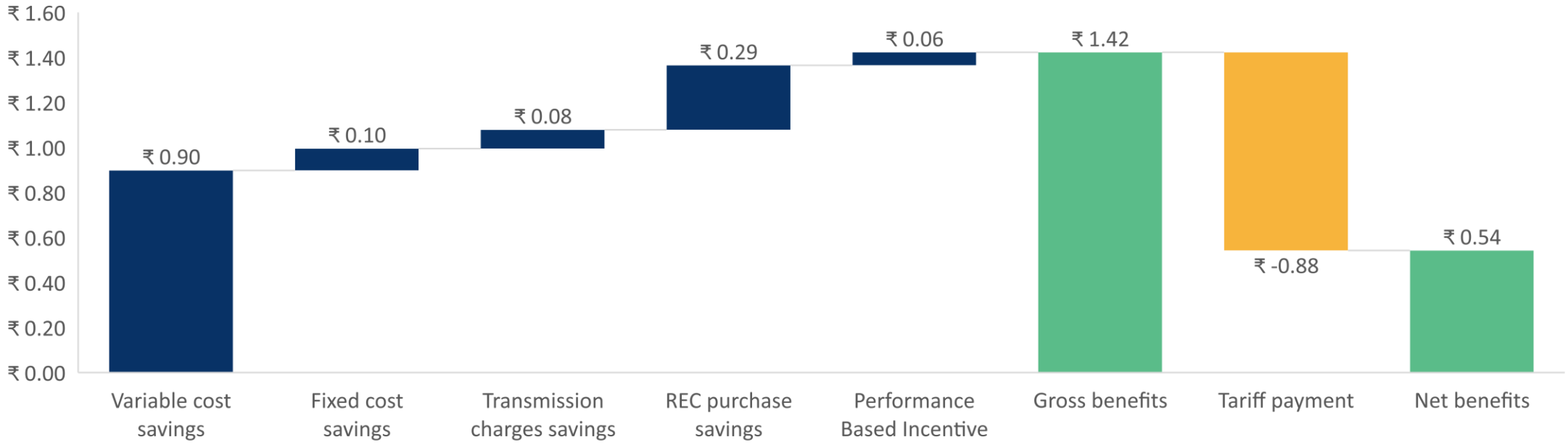
Seasonality of agriculture power consumption

This is a genuine concern in agriculturally intensive states. Both feeder selection and plant sizing are key to resolve this challenge. States can use their initial round of allocation to test these strategies

- **Optimal feeder selection criteria:**
  1. Feeders with significant agriculture load
  2. Substations in which non-agriculture load is also significant
- **Optimal plant sizing**
  1. Analysis of base load in the new power supply scenario
  2. Sizing based on the base load

Similarly, is there a financial benefit in Component A?

Our analysis shows that there are several tangible and intangible benefits



Source: CEEW (2021) – cost-benefit analysis of Component-A for a discom in Karnataka. The assumptions are based on tariff order for FY21

But what about other key concerns…?

Our study shows that some commonly held concerns can be resolved

"we have excess capacity contracted already? Wouldn't adding new capacity under Component A increase cost?"

Excess contracted capacity

Even if it takes a few years for the capacity cost savings to kick-in, analysis shows that the benefit remains significant. Study findings for Karnataka:

Number of years for peak demand to catch up to the current contracted capacity	Net benefit from Component-A per unit
5 years	INR 0.53
7 years	INR 0.53
9 years	INR 0.52

Source: CEEW (2021) – cost-benefit analysis of Component-A for a discom in Karnataka. The assumptions are based on tariff order for FY21

"we are getting much cheaper power from solar parks? Isn't it a better alternative to reduce cost?"

Solar parks vs distributed solar plants

Solar park tariff does not reflect the actual cost of power

The landed cost of solar power is much higher than the tariff. It includes:

- ISTS charges
- ISTS losses

} Currently zero

- STU charges and losses
- 33 kV wheeling losses

Distributed solar plants are needed to meet India's RE targets

States will have to diversify their energy procurement as several challenges are likely to emerge in the future:

- Land resource constraint
- Land alienation and impact on livelihood of grazers
- Impact on several species' habitat

Distributed solar plants support the local economy

- Employment generation at a local scale: Distributed plants have higher employment generation potential than solar parks
- Improved quality of power might support rural industrial growth

(Initial findings from the MSKVY in Maharashtra)

What is holding back developers?

Our conversations with developers revealed multiple concerns for both components

Grid unavailability and voltage variation

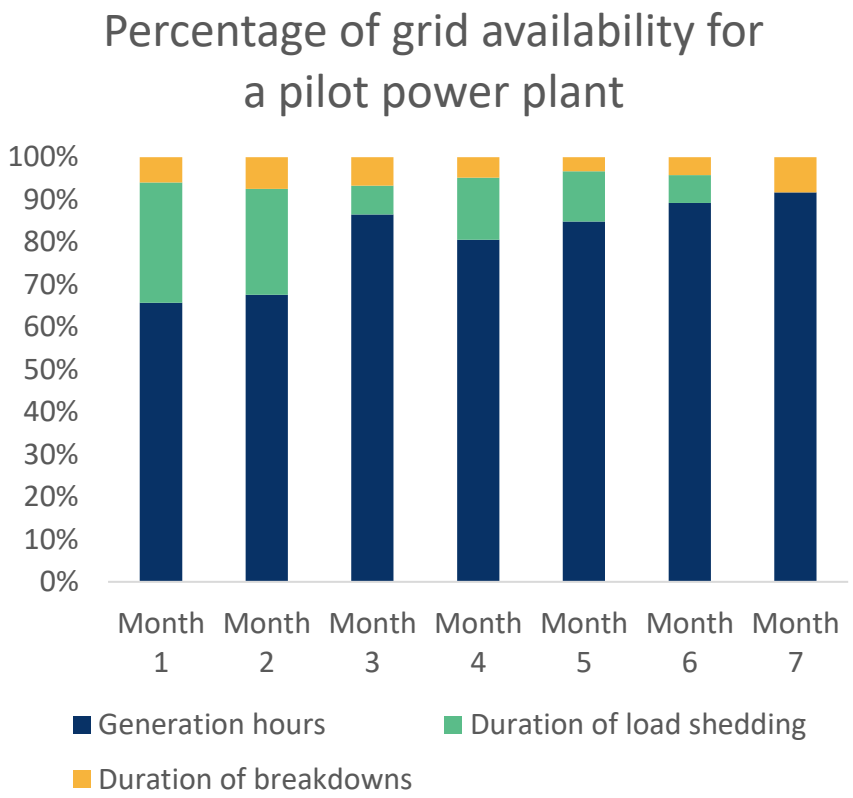
- Grid availability at distribution level is often less than 90%
- Voltage often falls below 90% pu affecting the system

Guarantee a minimum % of grid availability

- Some states guaranteed a minimum percentage of grid availability to allay developers concerns
- State compensates any shortfall at a pre-determined tariff

Targeted improvement of substation infrastructure

- Bifurcation of feeders and adequate reactive power compensation
- PMKUSUM-RDSS convergence



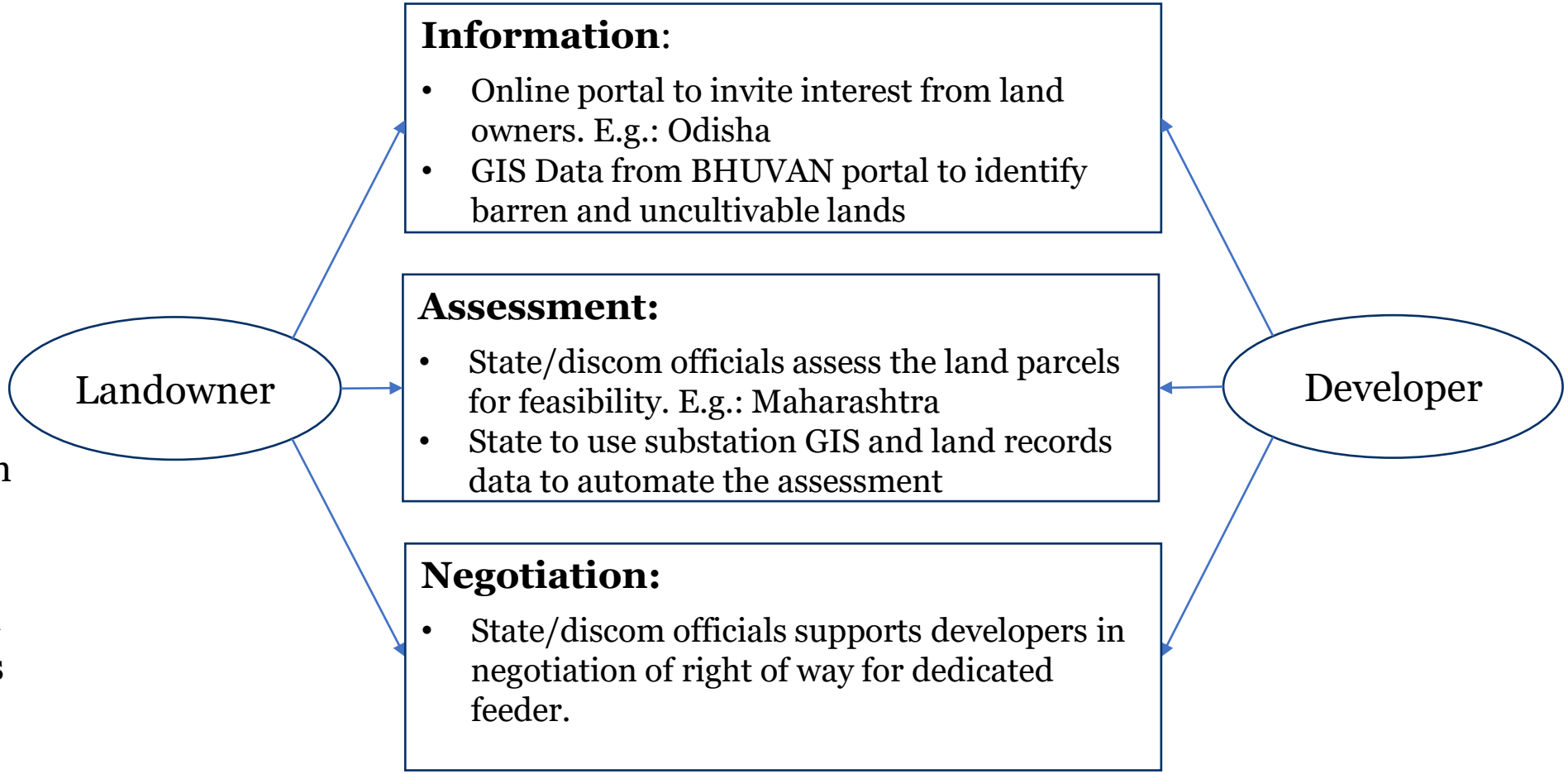
Source: Authors' analysis based on data from Padole et al. (2022)

Land-related challenges

Many developers find it costly to scout and identify suitable land parcels

Main challenge is the barrier in interaction between developers and landowners

States can facilitate interactions between developers and prospective landowners through land bank initiatives



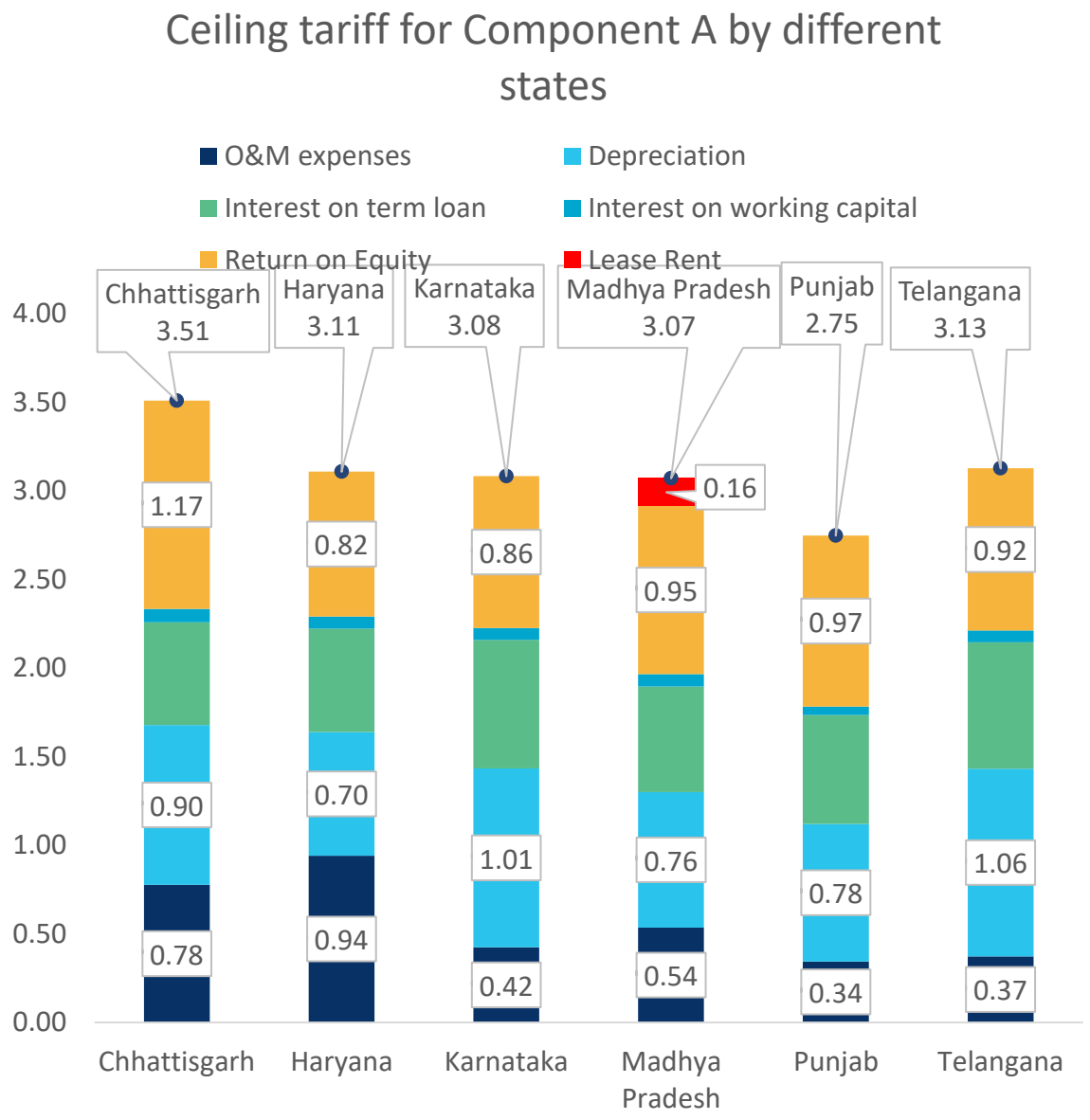
Unviable tariffs

Developers find the tariff set by many states unviable. Key issue include:

1. High O&M cost per MW
2. Higher capital cost
3. Logistical overheads

To address these concerns, states should

1. Refine LCOE calculations
   - Prior consultations with local developers
   - Utilize reliable data sources for updating the capital cost
   - Proactive adjustment of tariff based on policy changes
2. Explore alternative tariff calculation
   - Cost saved approach – states can analyse the maximum tariff at which PM-KUSUM remains beneficial for state



Source: Authors' analysis of different SERC orders

Payment-related challenges

- Delay in payments affect the cash flow of developers
- MSMEs are the most promising investors but have limited capacity to absorb payment delays

Revolving Letter of Credit (LC) will help; but is not a silver bullet

Only few states currently provide LC facility. LC will reduce risk for developers

But LC encashing is tedious and MSMEs hope for solid steps to ensure timely payment

Partnership with CPSUs

CPSUs as an intermediary fuelled the growth of utility-scale solar parks. States can try out the same model for PM-KUSUM

Work with banks for facilitating flexible loan repayment terms (Component A)

Opting for low-frequency repayment would buffer any delay in loan repayment.

Availability of credit for farmers

Many banks have come out with loan guidelines for PM-KUSUM

Initial consultations with state-level banking officials reveals a lack of awareness about the loan schemes for PM-KUSUM

Close coordination between SIA and SLBC

- Monthly review of progress in financing. E.g.: PMEGP, MUDRA schemes
- Training sessions for bank representatives

Partnership with one or two banks

- States can engage in special partnership with one or two scheduled commercial banks to promote PM-KUSUM. E.g.: Solar farmer scheme, Karnataka

Thank You!

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