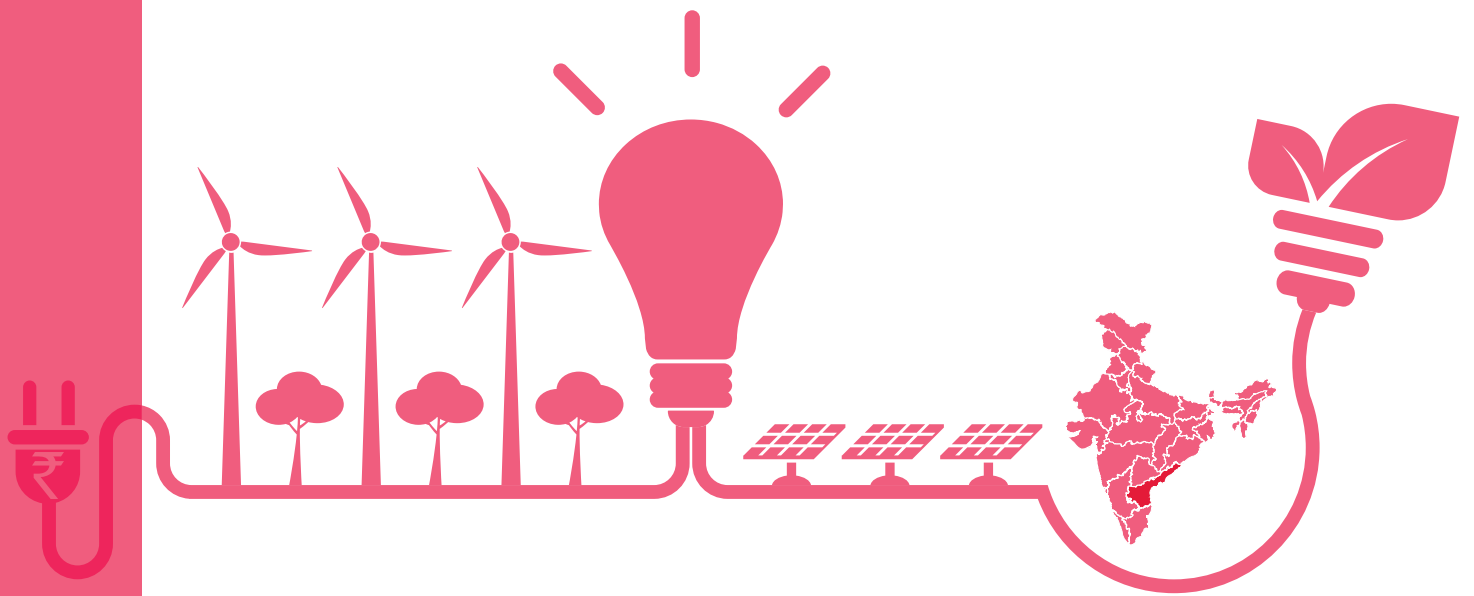


Climate Mitigation Financing Framework in Andhra Pradesh

2020



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Year of Publication: 2020

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Context

The Paris Agreement, which came into being in 2015, committed to containing the increase in global temperatures to between 1.5oC and 2oC to ensure sustainable life on earth. India, along with other countries that ratified the Agreement, drafted its Nationally Determined Contributions (NDC) and submitted the same to the United Nations Framework Convention on Climate Change (UNFCCC) in 2016.

According to a broad estimate presented in the 2018-19 Economic Survey of the Government of India, an investment of around US\$ 250 billion is required by the country for the period 2023-2030 to achieve its NDC on Renewable Energy (RE) alone. At the sub-national level, each state would have to identify key climate change mitigation actions (CCMAs), in alignment with NDC, and identify financing opportunities. Given this need, the Ministry of Environment Forests and Climate Change (MoEF&CC) has asked all states to revise their State Action Plan on Climate Change (SAPCC).

In January 2018, the Ministry released a guidance document titled 'A Common Framework for Revision of State Action Plan on Climate Change', asking state governments to clearly define their financing roadmaps to implement climate action plans. The document makes it clear that the financial resources required should primarily be leveraged from existing budgets of State Governments, and by convergence with relevant schemes and programmes[1]. Further, an SAPCC should bring funding from the State's own resources, beyond the ongoing schemes and

programmes of the Government of India.

However, it is not possible for State Governments to meet the substantial funding requirements of climate-mitigation actions through their budgetary sources alone. Recognising the need to provide adequate resources to implement SAPCCs, the 12th Five-Year Plan has launched a new central sector scheme titled "Climate Change Action Programme (CCAP)". This clearly says that a State Government should provide an enabling policy and regulatory environment to catalyse the engagement with the private sector as important implementation partners, which will, in the long run, benefit from improved competitiveness [2]. CCAP encourages states to develop innovative financing instruments to leverage state finances for climate actions.

In this context, this policy brief aims to assist policy circles in creating an enabling environment to leverage private financing for Climate Change Mitigation Actions (CCMAs) by presenting a case of the newly-formed state of Andhra Pradesh. Andhra Pradesh (AP) is yet to submit its revised SAPCC to the Central Government with a strategy to mobilize climate finance for effective climate action in the state. This Policy Brief is also an attempt to assist this process.

Since its formation, AP, through its mature governance apparatus, has been an early mover in initiating policies aimed at climate mitigation. These include policies pertaining to installation of various kinds of RE capacities, rollout of multi-modal electric mobility, subsidy provision to industries adopting green measures, and the

State's Energy Conservation Mission (SECM), which aims to incorporate Demand Side Management (DSM) practices in high-energy consumptive sectors such as industrial production, agriculture, residential consumptions, and municipal functions. One of the objectives of these policies is to attract investment, and hence it's important to understand how the AP government's policies and supporting programs are enabling investment for CCMA's. It is also necessary to identify aspects of public financing that require improvement such as fund flows, fund utilisation or its ability to deal with sudden changes in the regulatory environment .

The first part of the Policy Brief presents an overview of the findings from an earlier detailed assessment of the state's responsiveness to cli-

mate change mitigation actions through its institutional, policy and financial framework (Publication available on CBGA's website as 'State Financing for Climate Mitigation Actions: An Assessment for the State of Andhra Pradesh'). To put the findings into perspective, the latter part of the Policy Brief discusses recommendations originating from the earlier assessment. The policy recommendations address issues with state public financing, and suggest ways to increase investments for various climate-mitigation interventions such as Waste to Energy (WTE) plants, DSM management through Energy Conservation and Energy Efficiency (EE) measures, cleaner Industrial Processes and Product Use (IPPU), and Low Carbon Development (LCD) of the transport sector.

A

Overview of Findings from AP State's Assessment

A.1 Andhra Pradesh's GHG Emission Profile

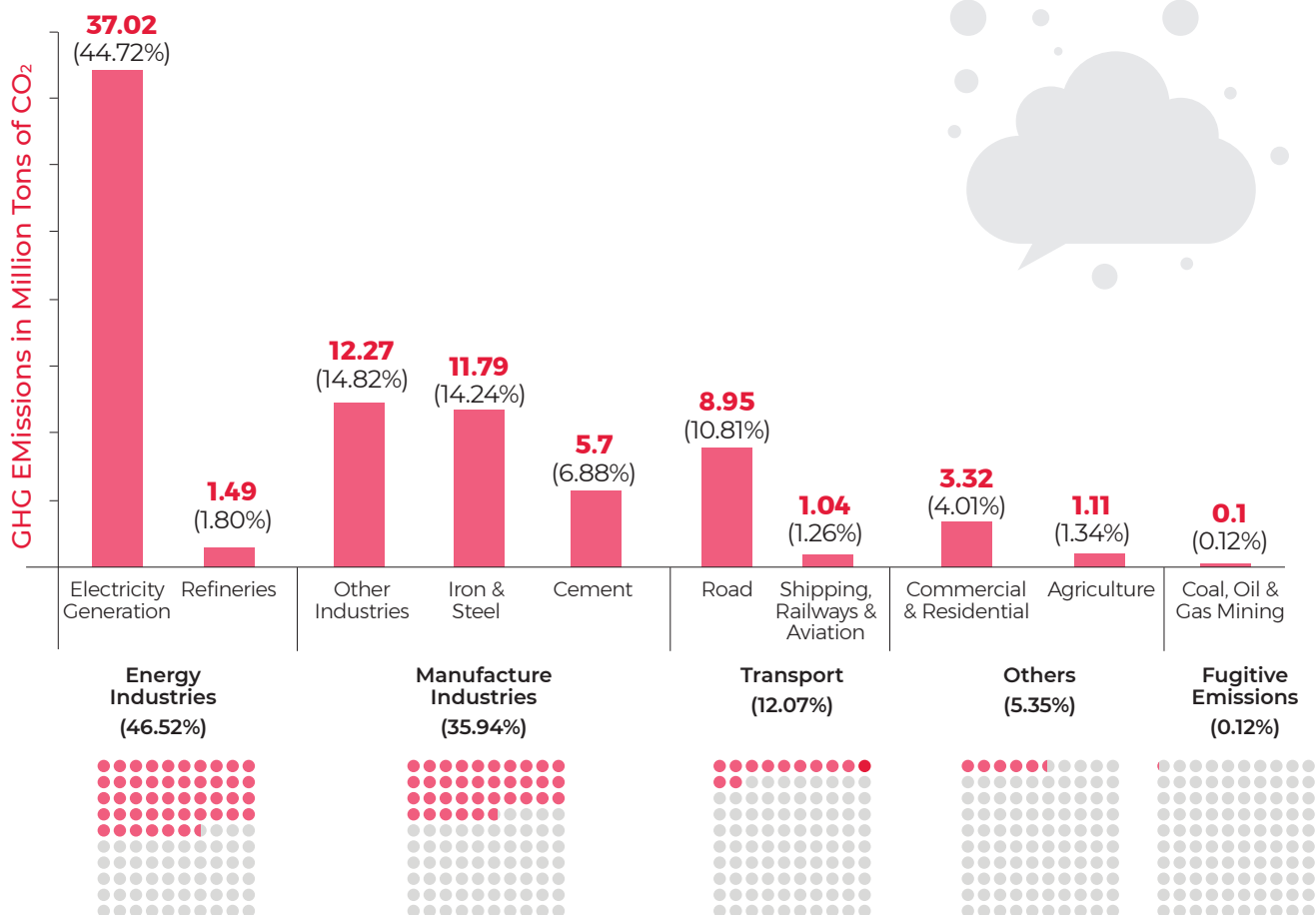
Andhra Pradesh share in India's total Green House Gas (GHG) emissions was 4 percent in 2013. The energy sector contributes about 65.74 per cent of AP's GHG emissions, indicating its immense mitigation potential. It is necessary for the state, therefore, to outline robust financing policies for this key sector to address the concerns of emission mitigation. According to the State's GHG inventory for the year 2013, the energy sector emitted 82.793 million tons of CO₂ eq. due to fossil fuel combustion in electricity generation (44.72%), transport (12.07%), commercial/ residential, agriculture/fisheries (5.35 %), and energy-intensive industries such as petroleum refining and manufacturing of solid fuels, including biomass use in residential areas (35.94%) and due to fugitive emission (0.12%) [3].

A. 2 Existing Policies and Institutional Setup to Implement CCMA

AP has well-defined policies for climate mitigation, and it makes revisions as and when required, in accordance with the Central Government's policies on mitigation. Climate change mitigation policies at the Central and state levels seem to overlap on mitigation and developmental goals. The existence of significant co-benefits of CCMA is proving to act as incentives for both state and national actions in terms of sustainable development.

Some major policies in the state aimed at climate mitigation and offering co-benefits include the policy for installation of solar, wind and off-grid Renewable Energy Technologies (RETs); policy for mass transit & multi-modal

**Figure 1: Emissions from Energy Sector in 2013-14
(million tons of CO₂ eq)**



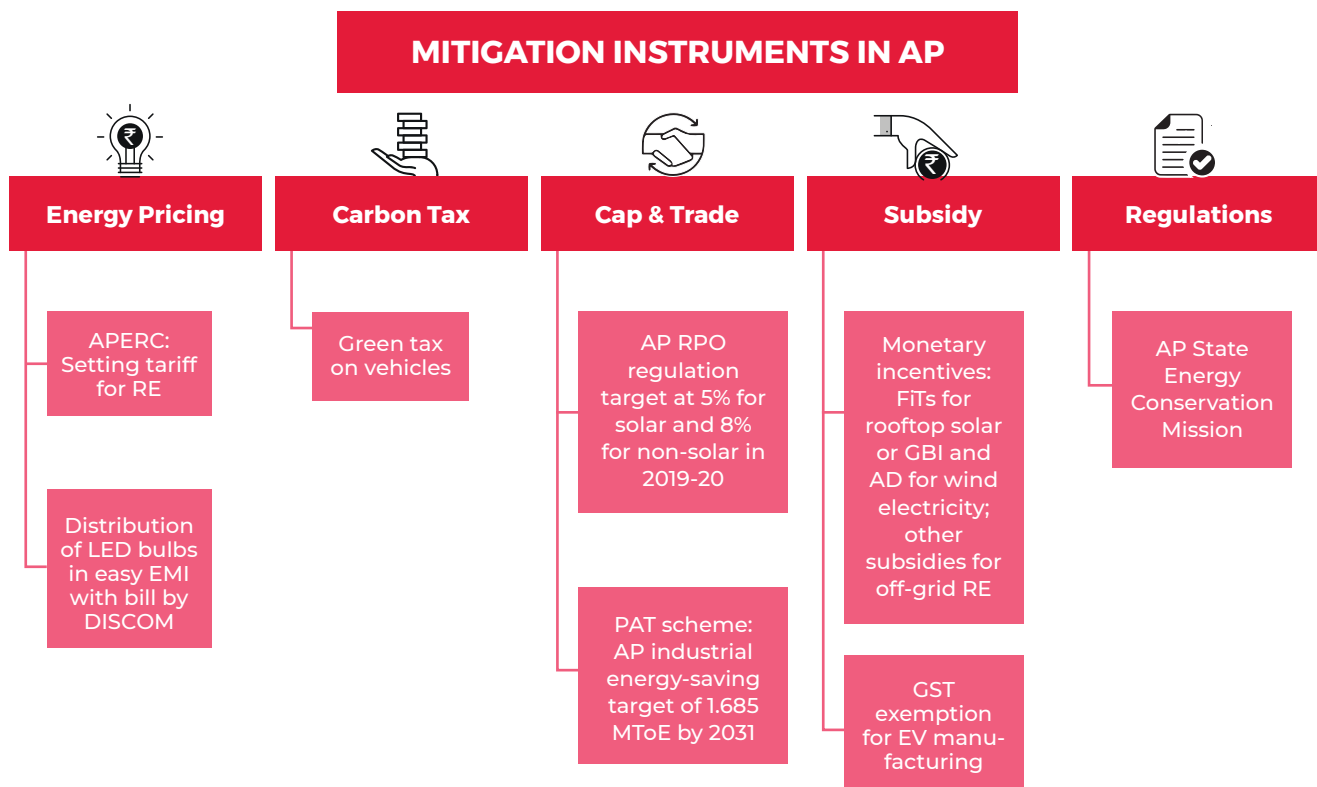
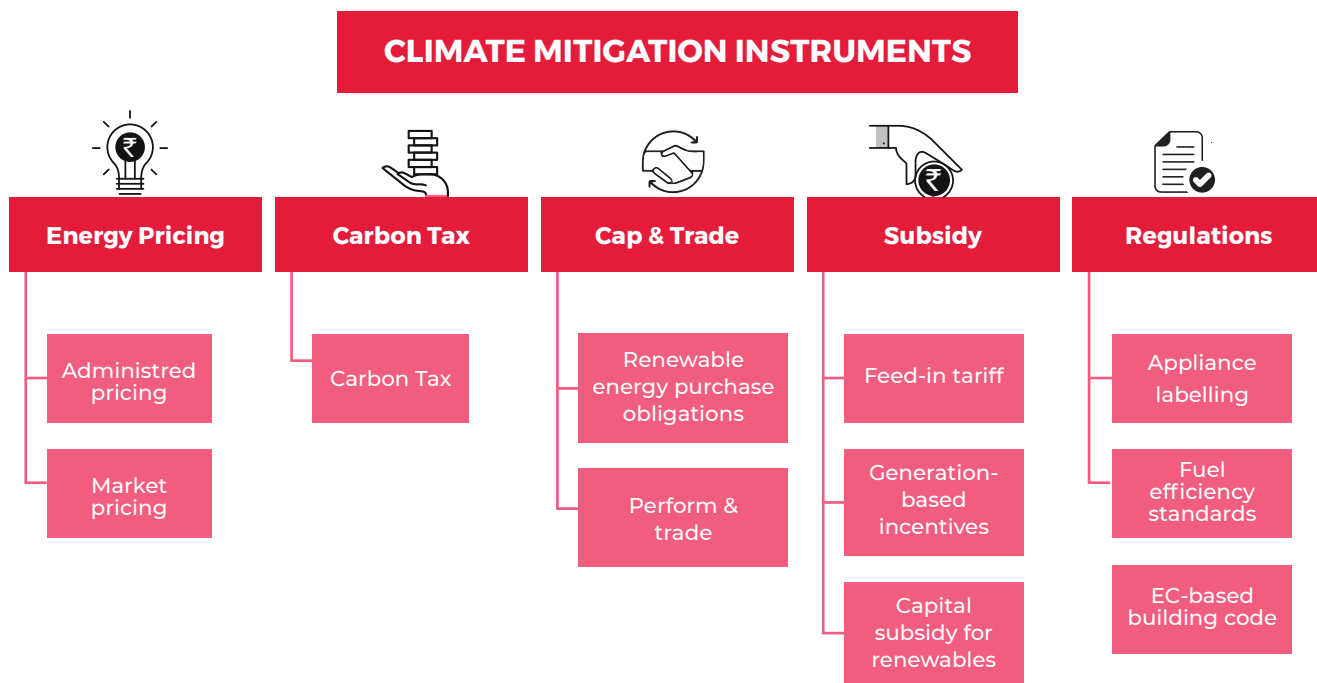
transport system such as inland water transport; policy promoting electrical mobility to curb air pollution; policy to develop industries with green measures; and the SECM to incorporate demand side energy-management practices in various high-energy consumptive sectors. The DSM interventions include Perform, Achieve and Trade (PAT) scheme in industrial production, energy-efficient pumps and solar pump sets in agriculture, LED-based lighting in municipal services and village amenities, municipal WTE plants and green measures in urban infrastructure such as green-rated buildings.

Most CCMA policies at the state level are co-

herent with the Central Government policies on climate mitigation and address sectors that contribute significantly to GHG emissions. There are, however, no clear time-based targets to reduce GHG emissions in AP's CCMA policies. Most policies have a defined institutional apparatus to implement them, though there is a lack of information in the public domain on their operational plans.

Most central policies prescribe the creation of dedicated state nodal agencies or Special Purpose Vehicles (SPVs) to implement large-scale projects and manage incentives offered under central policies. In line with the Central Government's policies, AP has created State-Owned

Figure 2: Existing Climate Mitigation Instruments in Andhra Pradesh in Accordance with Central Mitigation Instruments



Source: Planning Commission Report, 2014 [4] and Compilation from review of AP Policies

Enterprises (SOEs) to manage and implement policies, especially for large-scale projects. For example, the AP Solar Power Corporation Private Limited (APSPCL) has been created to manage Solar Parks and the Ultra Mega Solar Power Scheme under the National Solar Mission (NSM), along with central institutions such as the Solar Energy Corporation of India (SECI), the AP State Energy Efficiency Development Corporation Limited (APSEEDCO), and the Swachh Andhra Corporation (SAC) under a public-private partnership mode.

Table 1 provides a summary of policies, programmes and institutional setup to implement CCMAS in Andhra Pradesh.

Most policies discussed above help leverage private investments by offering incentives, structured programmes and schemes for funding. The policies also provide an enabling environment for participation by the private sector, encouraging investments from them. In the RE sector, these interventions include environmental clearances for RE plants under White Category, preferential treatment to project developers with RETS manufacturing units through the provision of power evacuation infrastructure, quality control and accreditation of channel partners and distributors, single-window clearances, deemed industry status and incentives to manufacturing units with installed RE plants, power and water supply to solar parks, and equal opportunities to investors through tendering processes, etc.

Most sectoral incentives offered under central CCMA policies have been instrumental in increasing the deployment of both solar/wind-based generation in the grid, and energy-efficient appliances at the state level. In accordance with national policies, AP is implementing all policy instruments under its various mitigation policies (**See: Figure 2**).

Some specific incentives offered under various CCMA policies/measures for the RE, industries and transport sector are as follows:

- Under the AP state's RE policies (Solar, Wind, Solar-Wind Hybrid Policies 2018), the offered incentives include exemption from transmission and distribution charges till the nearest Central Transmission Utility (CTU); Renewable Energy Certificates (RECs) to investors to set up projects for captive use within the state or for third-party sale within and outside AP; exemption from obtaining an NOC/consent from the AP Pollution Control Board; preferential treatment for off-take of power, evacuation connectivity and extension of energy banking facility for projects developed by manufacturers[5],[6],[7]. However, with the recent change in state government, certain incentives have been withdrawn following amendments in various RE policies[8].
- Under the AP Industrial Development Policy 2015-20, a capital subsidy of 25% in the total fixed capital investment (excluding cost of land, land development, preliminary and pre-operative expenses and consultancy fees) of a project is provided by the State Government to industries with a ceiling of Rs. 50 crores. This support is given for using renewable power for captive consumption (solar, wind and biomass plants). [9]The AP Electronic policy 2014-20 offers a general package of incentives to establish units to manufacture SPV modules and solar cells. [10]
- Under its Electric Mobility Policy 2018-23, the State Government offers a few incentives. These include a 10-25% capital subsidy to the first two electric car manufacturing firms; stamp duty reimbursement to manufacturing firms for the purchase or lease of land; and state GST reimbursements to manufacturing firms for the first 5 to 7 years, along with discounts in power and water tariffs.[11]

Table 1: Existing Policies and Institutional Setup for Implementing CCMAs in Andhra Pradesh

	 Installation of Renewable Energy (RE) Capacities	 Clean Industrial Processes and Product Use	 Low Carbon Transport
Policies for CCMAs	National Action Plan on Climate Change, National Solar Mission, Wind Energy Mission and Coastal Tidal Energy Mission	National Mission on Enhanced Energy Efficiency, National Resource Efficiency Mission (Draft)	National Electric Mobility Mission
State Policies	AP state GHG inventory, AP Solar, Wind, Solar -Wind Hybrid Policy 2018	Industrial Development Policy, Electronic Industries Development Policy	AP State Electric Mobility Policy 2018-2023
Central Institutions coordinating Policy	Ministry of New and Renewable Energy (MNRE), Ministry of Power (MOP), Ministry of Environment, Forests & Climate Change (MoEFCC), Non- Banking financial Corporations such as IREDA), Soar Energy Corporation of India(SECI)	Ministry of Heavy Industries & Public Enterprises, Bureau of Energy Efficiency (BEE), Ministry of Power (MOP), Energy Efficiency Services Limited (EESL), MSME	Ministry of Heavy Industries & Public Enterprises, Ministry of Environment, Forests & Climate Change (MoEFCC), Ministry of Road Transport and Highways
AP State Government Department implementing Policy	State Department for Energy, Infrastructure & Investment (E I & I)	Department of Industries and Commerce, State Department for Energy, Infrastructure & Investment (E I & I)	AP State Department for Road Transport and Department (APSRTD), Municipal Administration and Urban Development
Central Institutions coordinating Policy	State PSUs- New and Renewable Energy Corporation Limited (NREDCAP), AP Southern and Eastern Power Corporations Limited (AP DISCOMs) , AP Solar Power Corporation Pvt. Limited (APSPCL, which is a state designated agency for RE mega projects)	Dedicated State PSU- AP State Energy Efficiency Development Corporation (APSEEDCO)	State PSU- AP Road Transport Corporation (ASRTC)
Central Programmes	Schemes Designed under National Solar Mission - Solar Rooftop Programme, Canal Roof top Programme etc.	Demand side management programmes under National Mission for Enhanced Energy Efficiency (NMEEE)	Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME-India) Scheme and Clean combustion Fuel standards
State Programmes	Rural Electrification programme using off - grid technologies, Solar water heating system, Improved Chulhas Programme	Various Programmes under State Energy Conservation Mission (SECM)	Mass transit movement programme through buses & Metro rails programmes, Rolling Electric Vehicles in process
Financing instruments under Policy	State Subsidies, Central Loan and Subsidy, Tax Exemptions, Setting Tariff for purchase of RE, Renewable Energy Certificates (REC)	Creation of State Energy Conservation Fund, Subsidies	Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME-India) Scheme and Clean combustion Fuel standards

Table 1: Existing Policies and Institutional Setup for Implementing CCMA in Andhra Pradesh

	RETs in Agriculture and Demand side management (Energy Efficiency (EE)) 	Sustainable Municipal and Urban Infrastructure 
Policies for CCMA	National Mission on Sustainable Agriculture (with EE & RE component)	Smart Cities Mission, Various Central Clean Energy Policies such as the Waste to Energy policy, Components under Swatch Bharat Mission, National Mission for Enhanced Energy Efficiency with Public Street Lighting, Green Rating of Buildings
State Policies	AP state GHG inventory, AP Solar, Wind, Solar -Wind Hybrid Policy 2018	AP State Electric Mobility Policy 2018-2023
Central Institutions coordinating Policy	Bureau of Energy Efficiency (BEE), Ministry of Power (MOP), Energy Efficiency Services Limited EESL (PSU) Ministry of Environment, Forests & Climate Change (MoEFCC), Ministry of Agriculture & Farmer's welfare (Moa & FW), NABARD	Ministry of New and Renewable Energy (MNRE), Ministry of Power (MOP), Ministry of Environment, Forests & Climate Change (MoEFCC), Ministry of Urban Development, Bureau of Energy efficiency (BEE), Energy Efficiency Services Limited (EESL)
AP State Government Department implementing Policy	Panchayats and Rural Development Department, Agriculture and Fisheries Department	Municipal Administration & Urban Development Department
Central Institutions coordinating Policy	New and Renewable Energy Corporation Limited (NREDCAP), AP Southern and Eastern Power Corporations Limited (AP DISCOMs)	Municipal Administration & Urban Development Department
Central Programmes	Solar PV programme, Energy Efficient Solar Pump Sets, KUSUM scheme	Waste to Energy Component under Swatch Bharat Mission, Domestic Energy Efficient Lighting Programme (DELPP), ECBG Codes, Smart Cities
State Programmes	NTR Jalasiri for solarized bore wells and solar pumps	Managing and tendering for WTE projects, Domestic Energy Efficient Lighting Programme (DELPP), Smart Cities .
Financing instruments under Policy	Solar PV programme, Energy Efficient Solar Pump Sets, KUSUM scheme	Waste to Energy Component under Swatch Bharat Mission, Domestic Energy Efficient Lighting Programme (DELPP), ECBG Codes, Smart Cities

A.3 Programmes and Schemes Delivering CCMAs

The AP government is implementing programmes and schemes in accordance with the Central and State Government policies for CCMAs. These are mostly funded through state resources and reflected in departmental budget documents.

- Schemes under the National Solar Mission such as Solar Parks and Ultra Mega Solar Power Projects, grid-connected rooftops and grid-connected PV plants on canal banks and canal tops are implemented by the State Government. Other off-grid RE programmes being implemented by the State Government include programmes to introduce improved cooking stoves, solar pump sets for agriculture, solar water-heating systems and solar lanterns. Electrification of tribal hamlets using off-grid technologies, and NTR Jala Siri Phase-II Scheme for solarisation of bore-wells are other off-grid programmes implemented by AP. Most off-grid programmes are subsidised by the Central Government, with a share from the State Government and other beneficiaries. Besides these programmes, the AP Energy Department is also implementing an externally-aided project on Green Energy Corridors (GECs) to install transmission infrastructure for RE plants.
- The Eastern and Southern AP Power Distribution Companies (APDISCOMs) and New & Renewable Energy Development Corporation of AP (NREDCAP) are implementing various national programmes for Energy Efficiency and Energy Conservation (EE & EC) such as Domestic Efficient Lighting Programme (DELP), UJALA, National Energy Efficient Agricultural Pumps Programme, Energy Efficiency Street Lighting Project, National Energy Efficient Fan Programme, Energy Conservation Building Code (ECBC) Norms and the PAT scheme. The State Government is implementing programmes in

co-ordination with the Bureau of Energy Efficiency (BEE) and the Energy Efficiency Services Limited (EESL), Ministry of Power (MOP), Government of India (GOI) [11]. These programmes are aimed at realising the energy-saving potential, of around 15,000MU per annum, in all sectors. The State Government has also established a State Energy Conservation Fund (SECF) for EE & EC measures.

- The AP State Road Transport Department (APSRTD) is implementing a project to build metro rails in Vijayawada and Amaravati cities under the Smart Cities Programme. Most projects, including those for the purchase of buses and deployment of metro rails, are carried out as externally-aided projects under loan assistance from multilateral and bilateral banks. The State Government has also offered several incentives to promote EV manufacturing, and the EESL is rolling out 10,000 electric buses for use in various AP Government Departments.

A.4 State Financing of CCMAs

State financing of CCMAs can be broadly categorised into three components:

COMPONENT A

State finances routed through the state budget to fund state schemes for CCMAs. These include seed capital from the State Government, as part of the initial investment, in dedicated SOEs such as APSCPL, APSEEDCO, and SAC.

COMPONENT B

State finances received through Central Financial Assistance (CFA) disbursed by the Central Nodal Ministry or Central PSUs (like EESL and SECI) as subsidies. These include performance grants transferred as per recommendations of the Central Finance Commission (CFC) to the State Government.

Figure 3: Framework Used to Analyse AP State Financing for CCMA

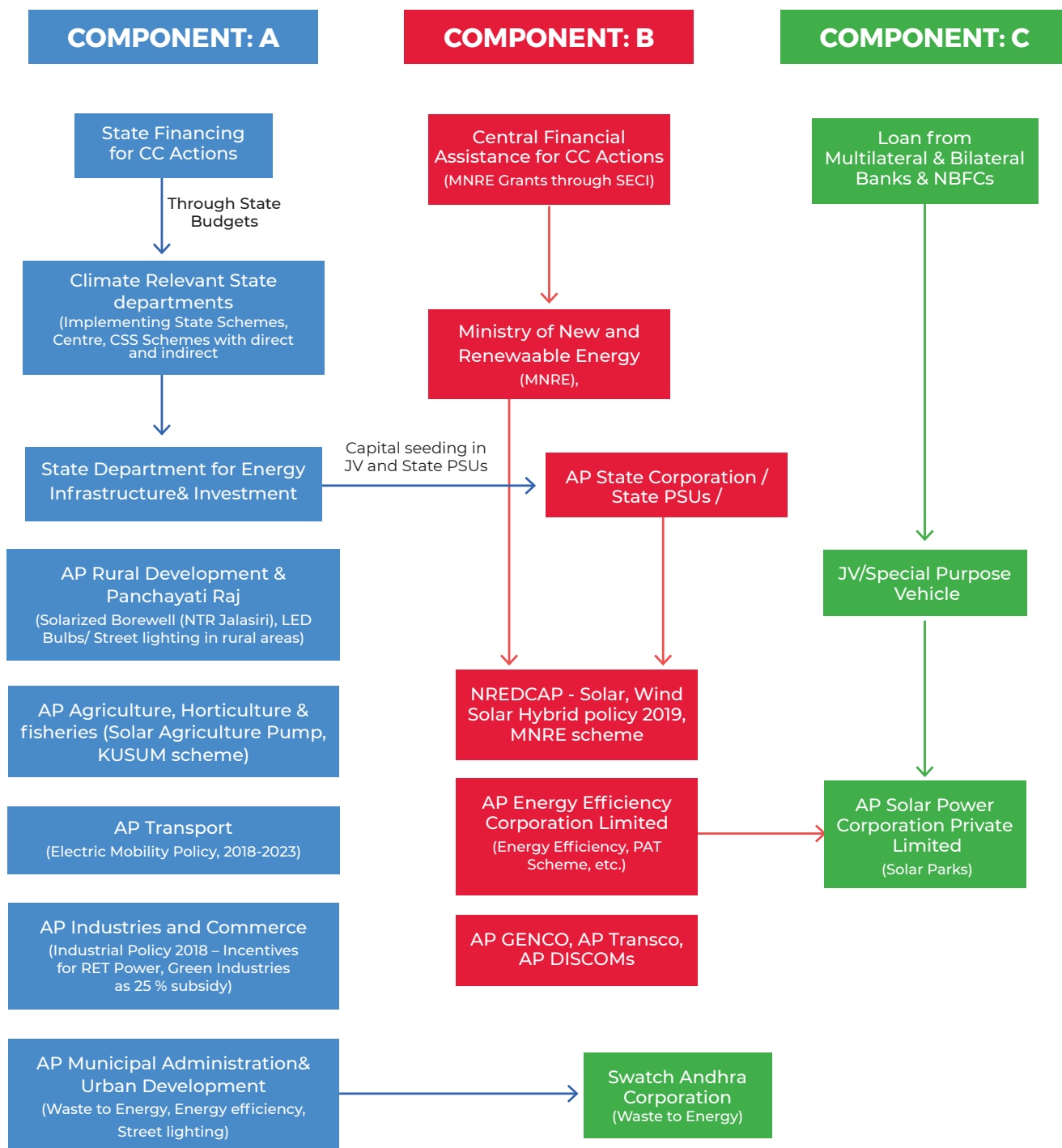


Table 2: Summary of State Finances for CCMA

Major Budget Head	State Scheme	2015-16 (A)	2016-17 (A)	2017-18 (RE)	2018-19 (BE)	DATA SOURCE
Component A: State Financing of CCMA through Budgeted Programmes & Schemes (In Rs. crores)						
2810- Renewable Energy (RE)	Development of other sources of energy (NREDCAP)	1.74	1.74	1.83	0	State budget documents
2810- RE	Improved Chulhas Programme	0	0	1.1	0	State budget documents
2810- RE	Solar Energy Programme	1.6	3	2.4	0	State budget documents
2810- RE	Solar Water Heating System Programme	0	0.5	0.5	0	State budget documents
2801- Power	Electrification of Dalit Bastis	20.88	20.88	0	0	State budget documents
2801- Power	Assistance to APSEEDCO	--	0	1.027	0	State budget documents
2515- Rural Development (RD)	NTR Jalasiri-II for solarisation of bore wells	--	15	20	0	State budget documents
2515 - RD	Electrification of villages under the LED Energy Efficient Lightings	--	--	--	15	State budget documents
3451 -Roads and Buildings (R & B)	Assistance to Andhra Pradesh State Road Transport Corporation (ASRTC) for purchase of buses	--	--	--	265	State budget documents
7055- R&B	Loans to APSRTC for purchase of buses	91	77	249	0	State budget documents
2217-Urban Development (UD)	Amaravati Metro Rail	5.5	1	..	3.6	State budget documents
4217-Capital Outlay on UD	Urban Development Assistance to Visakhapatnam & Vijayawada Metro Rail Project	11.6	0	5.3	5	State budget documents
Component B: Central Financial Assistance (CFA) to the State Government (In Rs. Crores)						
4217-Capital Outlay on UD	Subsidies by MNRE	82.5	162.75	63.70	130.2	NREDCAP provided data, MNRE Press Release
CFA to AP	Releases through SECI for Solar Park Scheme	225	737	NA	NA	Annual report, AP Eastern & Southern Power DISCOM
EESL Investment	Capital works under Streetlight LED in AP	18.07	69.36	119.17	NA	Annual report, EESL
EESL investment	Capital works in Agricultural DSM in AP	0.23	--	0.12	NA	Annual report, EESL
Component C: External Aided Projects and Loans Through NBFCs (In Rs. Crores)						
6801- Loans for Power Projects to APTRANSCO (External aided Project)	Green Energy Corridors - Intra State Transmission System in AP	--	30.29	240	308	State budget documents
Loan Disbursements by IREDA (Private investment from NBFC)	Loan to private investors in AP for RE	272.61	1858.45	2560.75	NA	Annual report, IREDA

Note: A = Actuals, RE: Revised estimates, BE: Budget estimates Source: Author's Analysis

COMPONENT C

External aids / loans from bilateral and multilateral banks routed through the state's budget and loans provided by non-banking financing corporations (NBFCs) such as IREDA. However, financing from NBFCs cannot be considered part of state finances.

Figure 3 presents the overall framework being used under this study to analyse AP state financing for climate-mitigation action across three components. The findings from the assessment on available state finances are as follows:

- 1** AP state finances, which flow through budgets, have been typically deployed to support small-scale RE projects in remote areas (e.g. electrification of Dalit settlements) with negligible private investment. Most off-grid RE programmes such as solar water-heating systems, improved chulhas programme, and other solar energy programmes such as solar lanterns are funded as state schemes by the AP Government. Large-scale grid-connected RE projects under the National Solar Mission are managed by SOEs.
- 2** APSCCL has been instrumental in attracting private investment and generating demand for products by providing incentives, designing appropriate financing instruments and managing the bidding process for large-scale RE projects.

- 3** The AP Government has been supporting the low carbon development of the transport sector in the state by aiding the establishment of a mass transit system, through measures such as purchasing buses and setting up metro rail networks in its Smart Cities. State budget allocations for the sector were mostly sourced through loans between the years 2015-16 and 2017-18.

- 4** State departments responsible for CCMA such as measures to promote energy efficiency, WTE production, cleaner industrial production and low carbon transportation are channelling finances through dedicated SOEs by investing seed capital. SOEs are following an operational framework based on Central and State policy frameworks for climate-mitigation actions. They have the capacity to blend capital provided by the State and the Central Governments with external sources of capital, and the flexibility to develop financial instruments to meet the needs of the CCMA policy implementation.

- 5** Capital investment by central PSUs such as EESL for energy-efficiency programmes is behind the immense progress towards energy conservation and energy efficiency measures in the state. Similarly, loans for large-scale RE projects through IREDA are in line with state and national targets for RE.

B

Recommendations to Enhance Effectiveness of AP State Finances on CCMA's

This section provides a few recommendations based on the findings discussed in the previous sections of this Policy Brief. The recommendations are aimed at assisting State Governments to take concrete steps to further encourage investment into climate-mitigation actions and to fill budget information gaps so that better financing instruments can be designed.

B.1 Financing Solar Pumps for Sustainable Agriculture: A Budget Neutral Opportunity

In order to facilitate affordable irrigation through groundwater sources, State Governments bear significant expenses by providing subsidy on both initial connection costs and recurring power consumption during pumping. The AP Government typically incurs a cost of Rs. 3,300 crores per annum for free power supply and capital subsidy to new agricultural pump connections. By comparison, its spending on agricultural solar pumps is meagre: 3 to 5 per cent of agriculture power subsidies. Table 3 provides a summary of the State Government

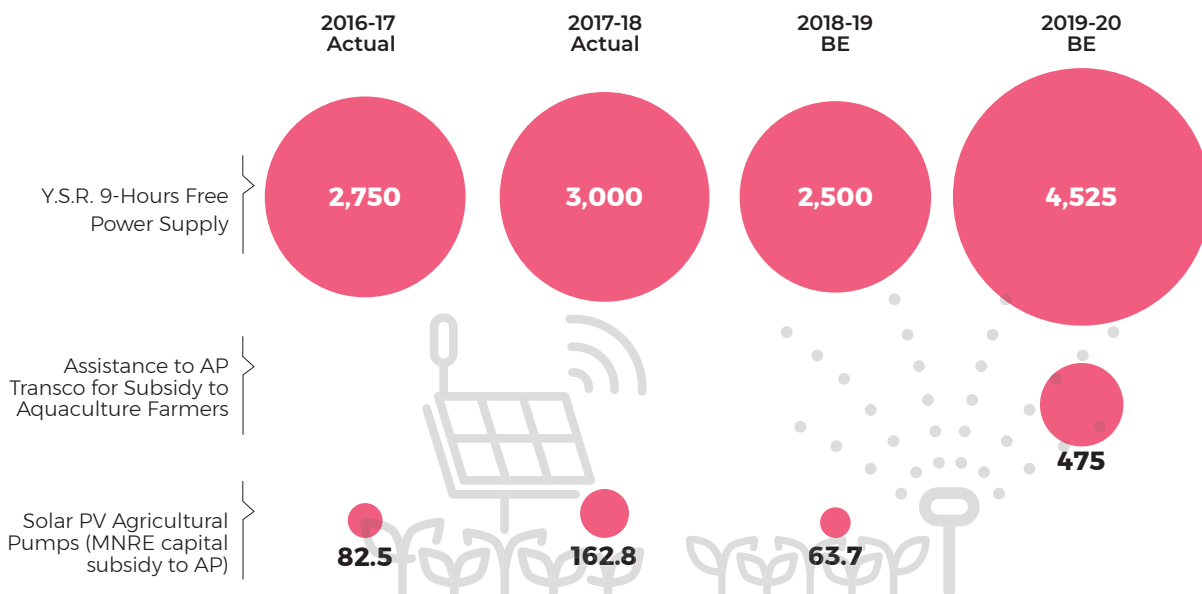
spending for free power supply, agricultural connections and solar pumps

Despite the subsidy on solar pumps, farmers still find electric pumps to be more economical than solar pumps as there are high subsidies on power in the agricultural sector. However, for the State Government to meet its target of adding 10,000 solar pumps every year, scaling up through incentives such as capital subsidy would need high fiscal expenditure. Government subsidy contribution varies from 15 to 30 per cent of the total cost of a solar agriculture pump, depending on its ownership [13].

Since solar pumps are affordable with MNRE subsidy, and promote long-term economic sustainability, the AP Government could incentivise the adoption of solar pumps in lieu of awarding new agricultural connections and free power supply, while keeping expenses well within limits of what it otherwise would have spent on the latter. Such a budget-neutral approach would enable the AP Government to subsidise the capital cost of solar pumps, without incurring additional costs.

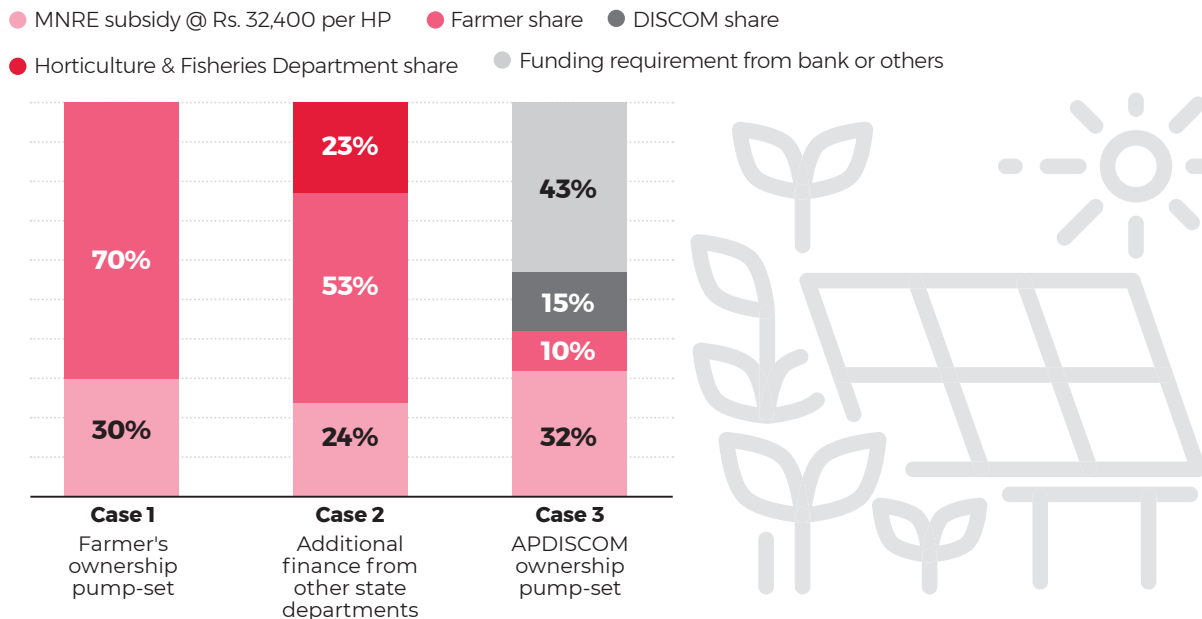
Another important aspect the government needs to keep in mind while financing solar

Figure 1: AP Government Spending on Free Power Supply (in Rs. Crores)



Source: State Budget documents. The spending data on Solar PV Agricultural Pumps has been provided by New and Renewable Energy Development Corporation of Andhra Pradesh.


Table 4: Cost Share Borne By Various Stakeholders in Solar Agriculture Pump Sets



Source: Eastern Power Distribution Company of Andhra Pradesh Ltd.

Table 5: Policy and Mitigation Actions Under Industrial Sector by the AP Government

Industries Sector: Policy and Mitigation Actions

Mitigation Action/ Policy/Programmes	Initiatives	Actions proposed for reduction of GHG emissions under policy
<p>Industrial Development Policy 2015-2020</p>  <p>“Perform, Achieve, Trade” (PAT) scheme, BEE</p>	<p>Initiated for faster, greener and inclusive growth of industries</p> <p>Currently some of energy intensive industries have been covered under the PAT scheme.</p>	<ul style="list-style-type: none"> ● Waste water treatment, especially zero discharge systems ● Green Buildings, ● Use of renewable sources of power for captive requirements ● Installing Continuous Emissions Monitoring Solutions (CEMS) for red category industries, ● Adopting rain water harvesting, ● Setting up industrial parks ● Waste to Energy ● Waste to Biogas ● Waste to manure <p>Strengthening and widening the scheme results in lowering GHG emissions</p>

pumps is to accord due importance to sustainability of water resources. Financing solar pumps should entail linking financial support and incentives for solar pumps to adoption of efficient irrigation practices and sound groundwater management. Government must think of financing models that give due consideration to a model promoting RE, reduce the burden of free power subsidies and curb overdrawing of water.

Recommendations: The AP Government should facilitate the creation of a supportive ecosystem for adoption of solar-based agricultural pumping through a gradual phase-out of subsidy support, measures to lower the cost of solar pumps and financing support through interest subsidies, while avoiding competition between different policies. The government should also ensure adequate efforts for wa-

ter conservation such as linking of financial support and incentives for solar pumps to the adoption of efficient irrigation practices and adherence to groundwater regulations.

B.2 Greening of Industries and State-Owned Enterprises: Inclusion of ESG Criteria

Over the years, Environmental, Social and Governance (ESG) criteria has become an increasingly popular way for investors to evaluate companies to invest in. Environmental criteria considers how an enterprise performs as a steward of nature. Social criteria examine how a company manages relationships with its employees, suppliers, customers and commu-

nities. Governance criteria deal with a company's audits, internal controls and shareholder rights.

ESG performance indexing has been recognised in Indian business reporting requirements following the release of guidance by the Securities and Exchange Board of India (SEBI). In November 2015, SEBI issued Business Responsibility Reporting (BRR) norms for the top 500 listed entities, thereby stipulating non-financial reporting by corporate India. The BRR captures an organization's non-financial performance across economic, environmental and social factors [14].

Inclusion of ESG criteria has the potential to not only promote investor attractiveness, but also improve the overall sustainability of the ecosystem of industrial development and operations in regional or state governance. For example, the recently-elected Andhra Pradesh government has made it mandatory for existing and upcoming industries in the state to reserve 75 per cent jobs for locals. This has been done through the passage of a new law called the Andhra Pradesh Employment of Local Candidates in the Industries/Factories Bill, 2019.[15] If industries follow ESG criteria, the alignment of investment activities with the community's welfare and fiduciary duty of the state government would be easier. Hence, there is great scope for ESG adoption in furthering sustainability in a state investment environment.

Currently, the AP Government has been relying extensively on capital subsidy mechanisms to green its industries. AP's Industrial Promotion Policy has incentives for industries for adoption of green measures. The AP Government is providing 25% capital subsidy in the total fixed capital investment of the project (excluding cost of land, land development, preliminary and pre-operative expenses and consultancy fees) for the use of renewable power for captive consumption (solar, wind and biomass plants) in industries with a ceiling of Rs. 50 crores. Subsidy is also offered for

other green measures under the policy.

This was released by the AP State Department for Industries and Commerce, following the approval of subsidy-availing industries by the New and Renewable Energy Development Corporation of Andhra Pradesh. At present, actual deployment of these subsidies is slow, as there is no systematic and publically available measurement, reporting, and verification (MRV) structure for compliance with these subsidies. Adoption of ESG criteria could be one way to develop a MRV system for green subsidies.

RECOMMENDATIONS:

The Government of India has provided regulatory mechanisms and economic incentives (e.g. Green Industrial subsidies, Perform Achieve Trade, Feed-in Tariffs, Renewable Energy certificates) to engage the private sector. But actual deployment of programmes has been slow due to enforcement without setting of MRV indicators and early-stage implementation issues. Hence, a policy-level strategic alignment is required to counter such challenges.

The AP Industries and Commerce Department can consider introducing subsidies and incentives under its policies, based on industrial performance, according to the ESG criteria. As a way forward, even SOEs could think of including ESG criteria in their governance processes. This will improve their attractiveness for institutional investment along with the industries.

B.3 Evolving CCMA Policy Instruments to Enable Achievement of Co-Benefits, Revenue Generation for the Government and Alignment with Economic Structure

A recent paper released by the Working Group on Mitigation Instruments (WGMI) in India discusses key dimensions to build transparency

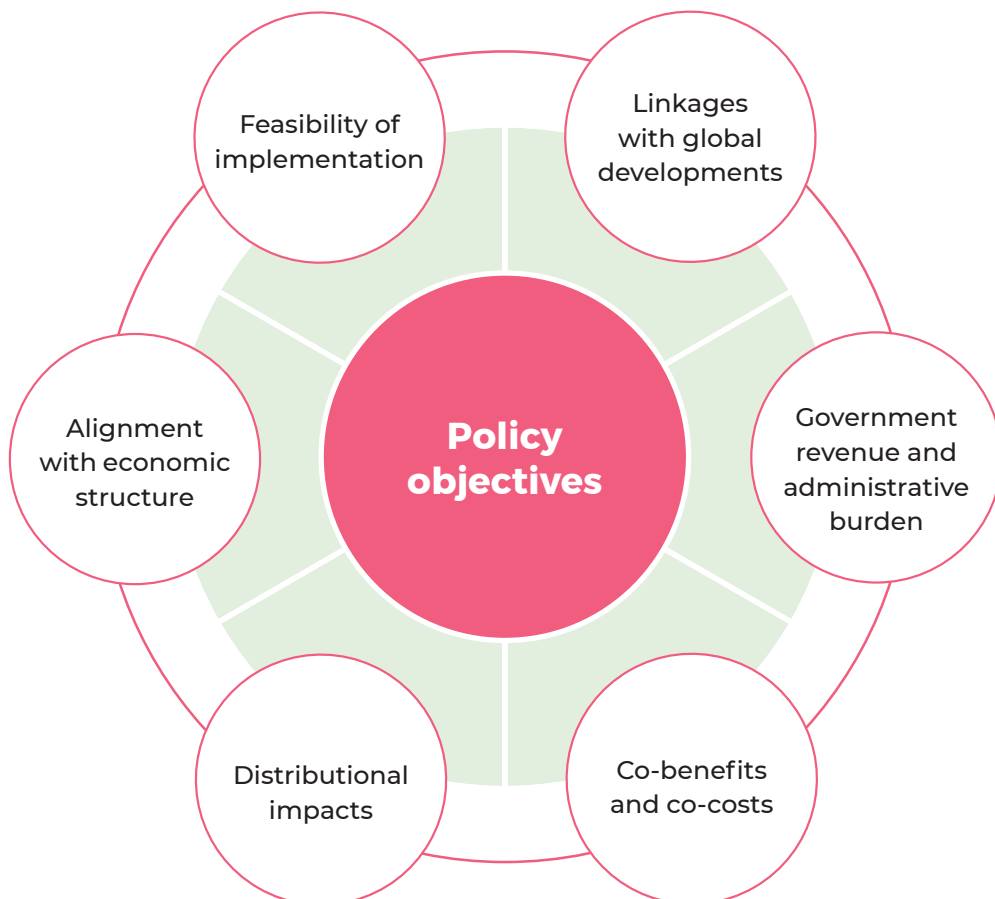
and accountability in the governance of CCMA policies [16]. Currently, the policy objectives of various sectoral regulations around the CCMA are vague and not clearly defined to encompass the various key dimensions (see Figure 5).

The EV Transport Policy in AP, for instance, does not define actions across different tiers of the government and does not prescribe a budget for actions to be taken. Under the policy, placing an EV-charging station in cities comes under the jurisdiction of municipal land limits. However, the associated State Department—the Municipal Administration—does not have any provisions in terms of responsibility, and hence makes no budgetary allocations. Moreover, a review of various CCMA policy objectives shows that

these don't spell out any revenue sources for the government or explicitly mention financing instruments or strategy, or linkages with global goals of sustainable development, or mention of co-benefits. For example, deployment of solar-based- agricultural pumps offers multiple co-benefits such as supplementary drinking water supply, contributing to gender empowerment (as most of the women are engaged in fetching water) and meeting household electricity needs when solar panels are not in use.

Most of the existing policies in the Andhra Pradesh are not defining the co-benefits of stipulated climate mitigation actions. Highlighting co-benefits in policy documents helps leverage a business investment case for the adoption of

Figure 5: Key Dimensions of CCMA Policy Emanates from WGMI 2019



Source: WGMI, 2019

green technologies and also a positive impact on international cooperation. For example, the canal roof top policy has clear co-benefits: save the government cost, time and inconvenience associated with land acquisition, and reduce water evaporation by absorption of heat by canal-top solar panels.

Few state governments, like Assam and Delhi, have tried to link their state budgets with sustainability indicators, by releasing SDG-centric Outcome Budgets for effective result-oriented expenditure [17]. However, even they don't follow it as a regular practice. At the national level, the Ministry of Finance, GOI, is also thinking of constituting a Climate Responsive Budgeting (CRB) Statement as a supplementary statement to the main budget to track domestic climate finances [18]. The AP government should consider a similar CRB statement to better understand the financial resource envelop it has to respond to climate change through a mitigation strategy. A dedicated dashboard can be created, with each departmental budget giving exclusive information on programmes and associated budgets for climate objectives and actions. This will inform debates on CCMA finances to design financing instruments.

Hence, current policies in AP around the CCMA require realignment around dimensions such as co-benefits, distributional impacts, alignment with economic structure, feasibility of implementation, government revenue and administrative burden, and linkages with global developments. Further, greater visibility and transparency is needed on objectives of CCMA policies and their financing strategies being adopted.

RECOMMENDATIONS:

There is a need for greater transparency in state climate policy objectives and budgetary allocations. There is need to define offered co-benefits by CCMA policies. It has been seen that clarity on available state finances, and their alignment with specific objectives and condi-

tions stipulated in CCMA policies, increase investor confidence, leading to better utilisation of available finances. The AP Government could create a web-enabled dashboard on available state finances for CCMA, with their specific objectives and conditions. A dedicated Climate Responsive Budgeting Statement can be considered by the state finance department. Thus, the government would be able to provide an enabling ecosystem for greater participation by private investors. This will improve transparency and accountability in state finances for climate change actions, and policymakers can think of innovation in financing instruments for efficient utilisation of public finances.

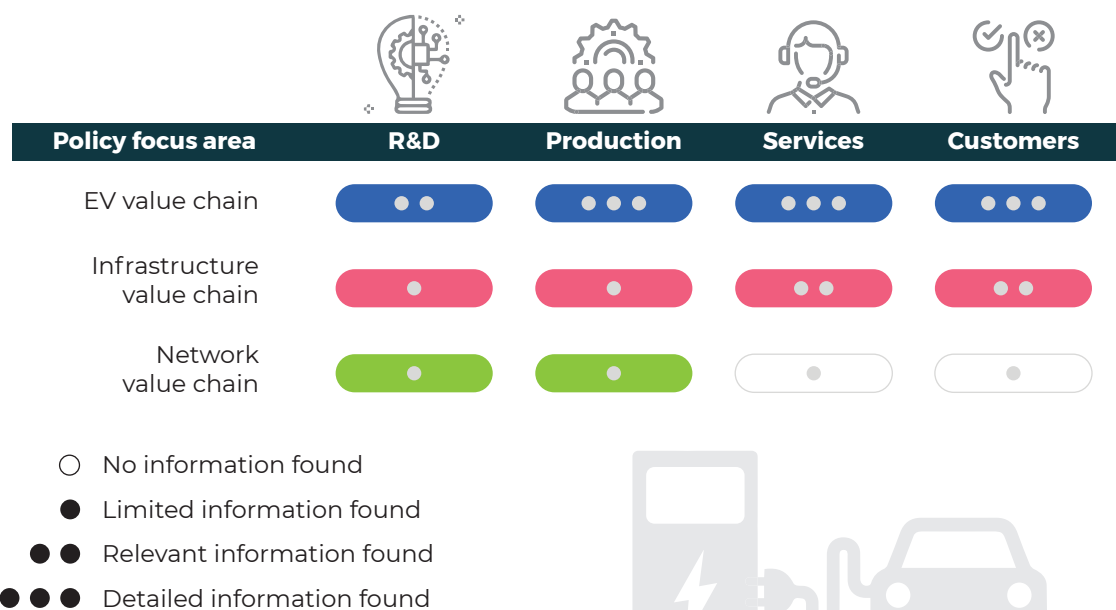
B.4 Need to Allocate Budgets for Demand Side Requirements in Electric Public Transport Ecosystem

The AP Government has a special focus on public transport. It plans to make all buses electric by 2029 under its Electric Mobility Policy, 2018, which details fiscal, non-fiscal and other incentives to accelerate electric-mobility activities in the state. The policy offers various incentives to accelerate manufacturing such as zero registration fee for development of EV manufacturing parks, stamp duty reimbursement for the purchase or lease of land, 100 % state GST reimbursements. Manufacturers such as KIA Motors, encouraged by the incentives offered, have set up units.

Currently, the AP State EV Policy is focused on the supply side (manufacturing) rather than the demand side of the EV value chain. A report by the World Economic Forum 2019 titled 'EV-Ready India' presents an analysis of EV policies in various states using a 'value chain framework'. The report raises similar concerns of "heavy focus on supply side" on the AP EV Policy [19].

This study presents a comparative analysis of EV policies in 10 states to determine how they

Figure 6: Value Chain Analysis for AP State’s EV Mobility Policy



Source: Adapted from World Economic Forum Report, 2019

are driving the production of (i) an EV value chain (ii) an infrastructure value chain such as charging infrastructure, and (iii) a network value chain with various stakeholders. It observes that the AP EV Policy lacks measures necessary for a stakeholders’ network value chain, which would create self-enforcing loops in the environment, connecting different stakeholders such as power distribution companies for electricity network, training institutions for skilling of existing workforce of drivers and maintenance staff, and communication partners for promoting consumer attractiveness for demand creation (See figure 6).

Besides, these pioneering efforts to create an EV policy, AP’s EV market is at a nascent state. Hence, the role of the State Government is very important in progressively accelerating adoption, diffusion and deployment of electric mobility. On the contrary, a review of the budget suggests the state is making big budgetary allocations for a fuel-based bus fleet. The state bus transport system, which is managed by the AP State Road Transport Corporation (APSRTC), is also facing many problems such as low productivity, conflicts with trade unions, capacity



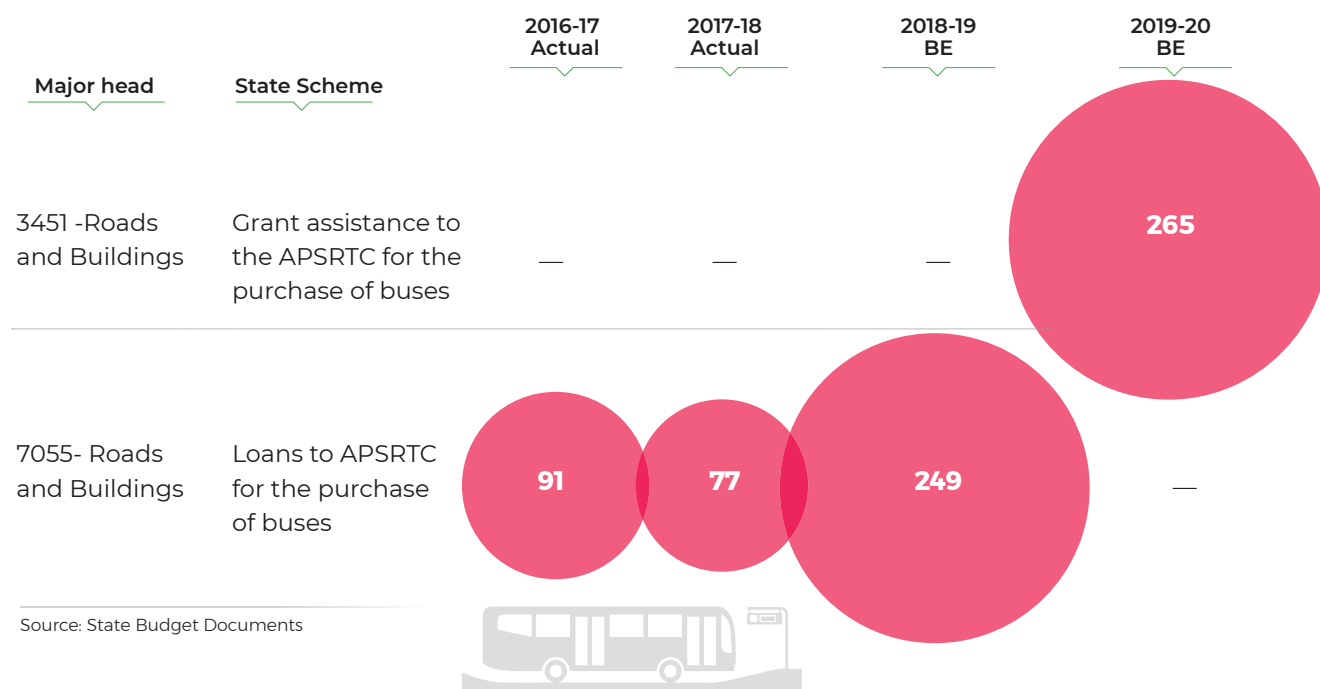
shortages and financial constraints. It is equally important to bridge these existing gaps in operations when introducing new EV policies or establishing an understanding with investors.

Until recently, the APSRTC was seeking a “demand creation incentive” for proposals from operators for procurement, operation and maintenance of 350 electric buses under Central Government scheme called Faster Adoption and Manufacturing of (Hybrid) and Electric Vehicles (FAME) [20]. Demand incentives under FAME are offered in the form of an upfront reduced purchase price, which will be reimbursed to the original equipment manufacturer (OEM) by the Government of India .

Such a demand-generating incentive is meant to create an ecosystem to provide an initial push to EV mobility. The State Government may have to find ways of “future pricing the operation of e-buses” by leveraging the expertise of different stakeholders to make sustained efforts for the adoption of electric mobility.

Demand incentives under the FAME-II scheme offered by the Central Government’s Department of Heavy Industry (DHI) are the tune of

Table 4: AP Government Spending on Fuel-based Public Transport (In Rs. crores)



Rs. 20,000 per KWh for buses and trucks; the maximum number of e-buses to be supported across India are 7,090. The AP Government cannot wholly depend on this Central Government scheme to achieve its state target of “all buses electric by 2029”. In terms of fiscal incentives offered through budgetary support by the AP Government, there is no allocation from state budgets for the purchase of EV buses yet, but there is an annual average spending of more than Rs. 100 crores for the purchase of fuel-based vehicles (mainly buses) by the APSRTC.

Since EVs have long-term sustainability associated with them, along with other co-benefits, the AP Government could allocate a part of its budget to create an EV-supporting infrastructure instead of purchasing fuel-based buses. Such a budget-neutral approach would enable the AP Government to deploy supporting infrastructure for EV mobility or undertake other activities such as consumer awareness programmes without incurring an additional

financial burden.

RECOMMENDATIONS:

In the initial phases of EV penetration, the aim of the AP Government should be to gradually reduce dependence on fuel-based public transport and develop an e-public transport system, by allocating adequate financial resources for the demand side or EV supporting infrastructure. Currently, the AP State EV policy is highly focused on the supply side of the EV value chain (manufacturing) rather than the demand side. There is a need for the government to play a proactive role in creating a conducive environment to create demand. This can be done by ensuring greater participation of stakeholders at every stage of EV adoption, which includes skilling for operation & maintenance, charging infrastructure by DISCOMs, and adopting measures to reshape societal dynamics to improve consumer attractiveness towards EVs.

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End Notes

- i.** Solar power generation using photovoltaic cells, wind power, mini-hydroelectric power (less than 25 megawatts) is among the major industries in the 'white category'. Industries in this category do not require any clearance from the ministry or consent to operate from State Pollution Control Boards. The Central Government released this categorization, based on the pollution load of these industries, in 2016.
- ii.** As per AP's Socio-Economic Survey 2018-19, the impact of Energy Efficiency & Energy Conservation activities implemented in the state, as on 26.06.2019, is expected to result in a reduction of 1.92 Million Tonnes in CO₂ annual emissions and an annual energy saving of 260 MW.
- iii.** According to the Energy Conservation Act, 2001, states are required to constitute the State Energy Conservation Fund to overcome major financial barriers in implementing energy efficiency projects in the states. The SECF of each state must be formed from equal contributions of Rs. 4 crores from the State Government and BEE (with the exception of north-east states). Most states have developed this fund for financing energy efficiency activities. AP has established Rs. 4 crores value SECF, with Rs. 2 crores contribution from BEE.
- iv.** The 13th Finance Commission recommended a grant of Rs. 5,000 crores to promote renewable energy, based on a performance index and proposals placed by various State Governments. MNRE is releasing capital subsidies for various off-grid renewable energy programmes such as solar water-heating systems, solar pump set programme etc.
- v.** According to the State Economic Survey, the AP government has set a target to drill and install 25,000 agricultural pumps with an estimated cost of Rs. 162 crores in 2019-20.
- vi.** Demand incentives under the FAME-II scheme are components that directly help in demand generation of EVs. According to the scheme's operational guidelines, demand incentives shall be available to buyers in the form of an upfront reduced purchase price to enable wider adoption, which will be reimbursed to OEMs by the Government of India. For buses, a uniform demand incentive of Rs 20,000 per kWh is proposed, which is further subject to competitive bidding among OEMs. Demand incentives are being provided only on the operational model (OPEX), and are being delivered through state/ city transport corporations on a Gross Cost Contract (GCC) Basis. Under GCC, the chosen operators will be paid on contracted rate per km travelled by each bus, subject to minimum guaranteed kilometres per annum on lot basis during the contracted period.

Report on Climate Mitigation Financing Framework in Andhra Pradesh

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Acknowledgements

We are thankful to Shakti Sustainable Energy Foundation (SSEF) for supporting CBGA for this project. We are thankful to Mr. Pustav Joshi and Mr. Raghav Anand from SSEF for providing useful feedback and suggestions on earlier versions of this publication. This study has benefited a lot from the insights and data shared by officials from the Andhra Pradesh State Development Planning Society (APSDPS) and the New and Renewable Energy Development Corporation of A.P. Ltd. (NREDCAP). Special thanks to Mr. K. Srinivas, General Manager (NREDCAP), for sharing valuable insights on the State's policies and finances for renewable energy. We are grateful to Mr. Kunal Gupta and Mr. Tharun Bathini (Consultants with APSDPS) for very useful inputs towards this study.

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About the Project

The project studies policy, institutional and fiscal measures which four select states, viz., Andhra Pradesh, Assam, Odisha and Rajasthan are undertaking to mitigate climate change, along with a reflection on the suitability of the budgetary provisions in meeting their State Action Plan on Climate Change (SAPCC).



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