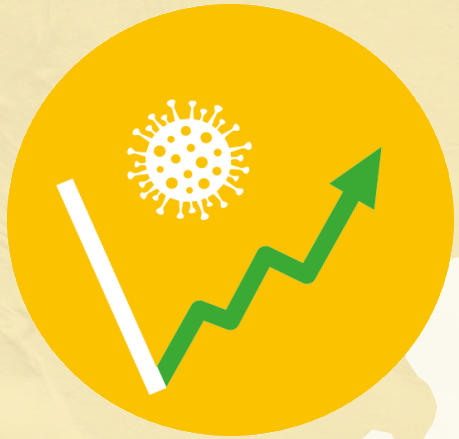


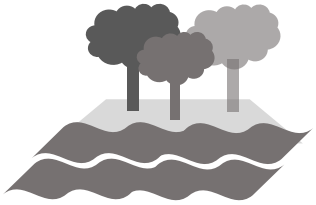
Andhra Pradesh's Public Policy Priorities for Transitioning Towards a Green Economic Recovery

CBGA

Content of the Presentation

- Profile of Andhra Pradesh
- Impact of Covid-19
- Need for green economic recovery
- Why the energy sector
- Major Issues
- Policy Suggestions
- Recommendations

Profile of Andhra Pradesh

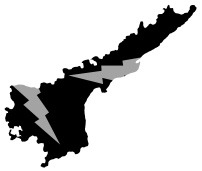


The state of Andhra Pradesh is blessed with land, water, forests and mineral resources. It also has a coastline of 974 Km, which is the second longest in the country.

It has 38.4 GW of solar power potential (5th in the country)

14,497 MW wind power potential at 80m

It has 36,914 sq. km forest area, or 23% of its geographical land. It is ranked 9th among states for area under forest land.



According to National Climate Vulnerability Assessment Report, AP is the 7th most-vulnerable state (.59).

Andhra Pradesh's Green Economic Recovery

State has a very high RE (Renewable Energy) potential

It formulated the Green Vision 2029 to achieve sustainable development in the state.

It aims to have a 30% share of renewable energy, 50% green cover, 100% drought proofing, 60% water use efficiency, 100% solid and liquid waste management.

Key energy efficiency measures, measures for sustainable transportation such as mass transit systems or deployment of Electric Vehicles(EVs) and charging infrastructure, measures aimed at cleaner industrial production processes and energy production from urban or rural waste.

Impact of Covid-19

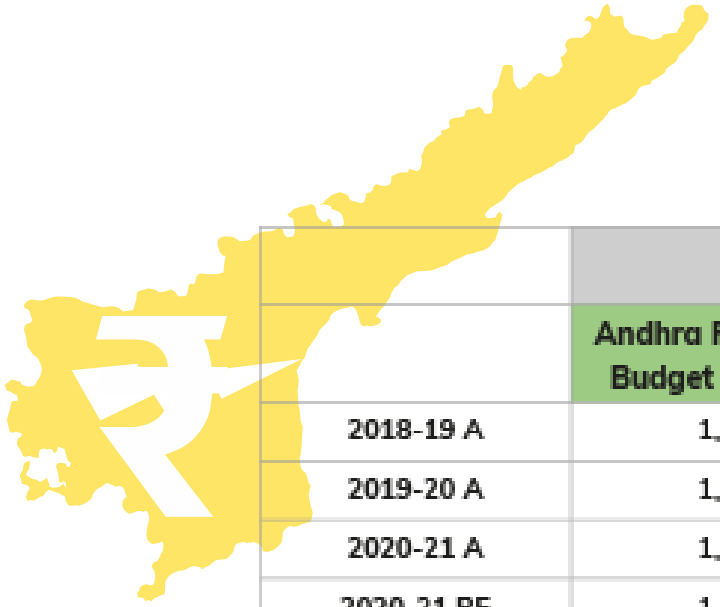
Andhra Pradesh had a modest Gross State Domestic Product (GSDP) of Rs.6,51,624 Cr. for 2020-21 (A). Its GSDP growth fell from 7.23% to -2.58% in 2020-21(A). Key sectors such as industry (-3.26) and services (-6.71) were the most impacted by the pandemic. (AP Socioeconomic Survey, 2020-21)

The onset of the COVID-19 pandemic has caused a variation in the percentage share allotted to the energy sector. There is a dip from 2019-20 A (6.73%) to 2020-21 A (3.31%).

The state of AP had unemployment rate of 20.5% (national average 11.9%) during the second wave of Covid (April-May 2020). Prior to this, it was as low as 5.8%. (Centre for Monitoring Indian Economy)

In 2021-22, amidst the COVID-19 pandemic, the Andhra Pradesh government increased its health budget allocation by 21.11% or Rs 13,830.44 crore. 2,09,765 patients were treated with preauthorized amount of Rs.732.16 crores.

Trends in Andhra Pradesh's Total Budget Expenditure (TBE) for energy sector budget



	Amount (in Rs. Crore)				
	Andhra Pradesh Total Budget Expenditure	Energy Sector Budget	Renewable Energy Budget	Energy Versus Total State Expenditure (%)	RE versus Total Energy Expenditure (%)
2018-19 A	1,63,960	2,188	66	1.33	0.03
2019-20 A	1,73,701	11,694	4	6.73	0
2020-21 A	1,87,102	6,184	4,048	3.31	0.65
2020-21 RE	1,85,468	6,176	4,048	3.33	0.66
2021-22 BE	2,29,779	6,637	4,533	2.89	0.68
2021-22 RE	2,08,107	12,768	8,795	6.14	68.88
2022-23 BE	2,56,257	10,281	4,500	4.01	43.77

Source: CBGA analysis Of Andhra Pradesh Budget and Detailed Demand for Grants for Energy Department, Andhra Pradesh

Note-Y.S.R Nine Hours Free Power Supply has used solar power from 2021-22

Total budget expenditure of various state departments: pre- and post-covid

Distribution of total budget expenditure across government sectors (Rs Crore)

Department	2017-18 A	2018-19 A	2019-20 A	2020-21 BE	2020-21 RE	2020-21 A	2021-22 BE	2021-22 RE	2022-23 BE
Environment, Forests, Science and Technology	4,054.4	2,550.3	12,015.9	7,542.0	6,537.7	6,461.9	7,443.7	13,196.9	10,966.4
Agriculture and Co-Operation *	9,114.2	8,860.3	6,334.4	15,412.0	9,453.5	10,309.5	14,906.7	12,346.8	15,106.9
Municipal Administration and Urban Development	4,244.3	6,562.2	4,877.9	8,150.2	5,426.2	4,166.1	8,727.1	8,055.3	8,796.3
Panchayat Raj and Rural Development	21,535.7	28,422.9	11,502.5	16,756.8	17,233.7	17,535.1	18,912.0	15,726.8	19,242.7
Transport, Roads and Buildings	2,545.2	2,610.4	3,011.7	6,588.6	5,503.0	5,395.5	7,594.1	5,975.7	8,581.3
Water Resources	8,936.6	14,355.2	5,335.4	11,805.7	5,238.0	5,435.7	13,237.8	8,428.2	11,482.4
State Total	**1,46,944.1**	**1,63,960.0**	**1,73,700.9**	**2,24,789.2**	**1,85,467.6**	**1,87,101.8**	**2,29,779.3**	**2,08,106.6**	**2,56,256.6**

Share of total budget expenditure across government sectors (%)

Department	2017-18 A	2018-19 A	2019-20 A	2020-21 BE	2020-21 RE	2020-21 A	2021-22 BE	2021-22 RE	2022-23 BE
Environment, Forests, Science and Technology	2.8	1.6	6.9	3.4	3.5	3.5	3.2	6.3	4.3
Agriculture and Co-Operation *	6.2	5.4	3.7	6.9	5.1	5.5	6.5	5.9	5.9
Municipal Administration and Urban Development	2.9	4.0	2.8	3.6	2.9	2.2	3.8	3.9	3.4
Panchayat Raj and Rural Development	14.7	17.3	6.6	7.5	9.3	9.4	8.2	7.6	7.5
Transport, Roads and Buildings	1.7	1.6	1.7	2.9	3.0	2.9	3.3	2.9	3.4
Water Resources	6.1	8.8	3.1	5.3	2.8	2.9	5.8	4.1	4.5

*** Plus Food, Civil Supplies and Consumers Affairs**

Source: CBGA analysis Of Andhra Pradesh budget and detailed demand for grants for Andhra Pradesh

Need for a Green Economic Recovery (GER)

There is a need to develop an economic recovery pathway that is compatible with sustainable development of the state. This will help mitigate the impact of sudden catastrophic events that could be a pandemic or any adverse climate impact.

Andhra Pradesh has a very high renewable energy potential. Government of AP formulated a "Green Vision 2029" for achieving the sustainable development in the state, recognizing energy as the key sector for achieving climate mitigation targets and setting ambitious plans to increase its RE capacity by 2029.

It aims to have a 30% share of renewable energy, 50% green cover, 100% drought proofing, 60% water use efficiency, 100% solid and liquid waste management, Infrastructure, which is resilient to disasters and reduced greenhouse gas (GHG) emissions which will help mitigate climate change.

The key driver for the GER of the state is the energy sector. Sustainable use of energy has a huge potential to reduce the GHG emission from the state.

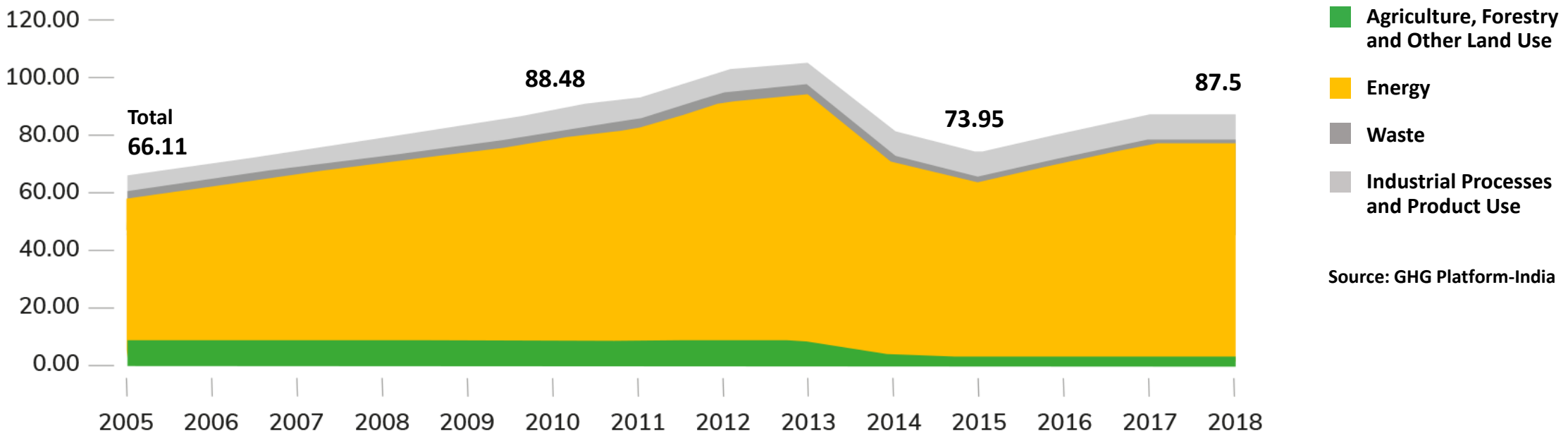
Why the energy sector?

Have the highest GHG emission compared to other sectors

From 2005 to 2018, there has been a 45% increase!

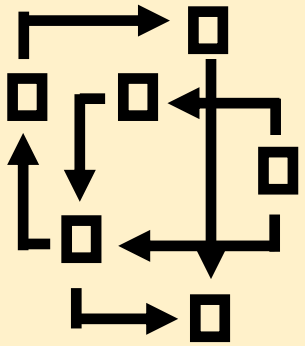
Trend analysis predicts that in 2022, the energy sector will contribute to 81 Mt of Co2, therefore the need for alternate energy is imminent

Emission from various sectors (Mt CO2e)



Source: GHG Platform-India

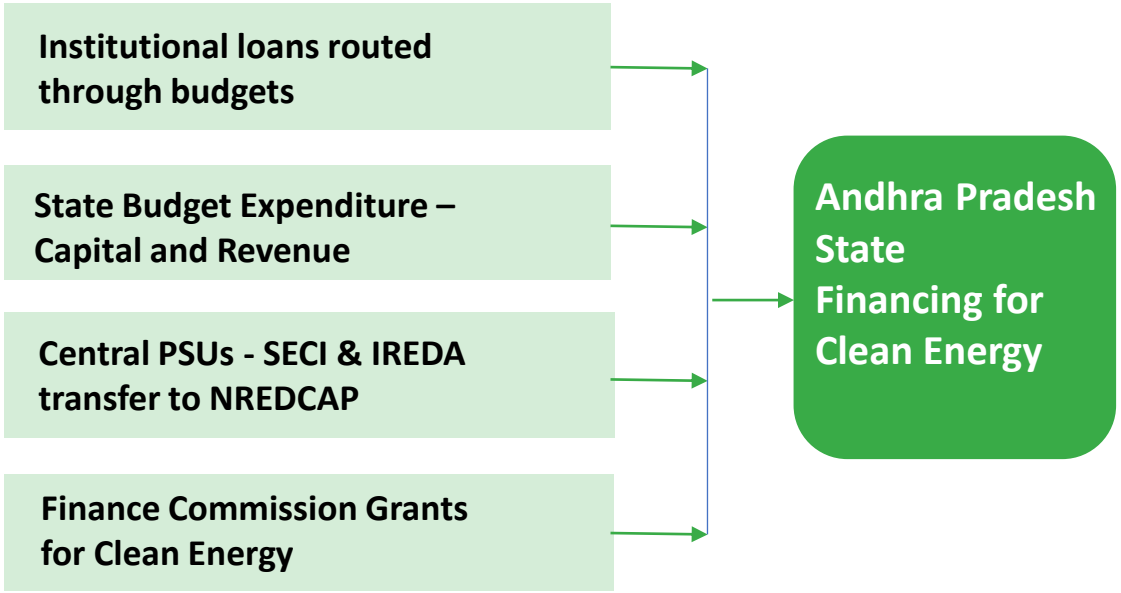
Methodology



The resource envelope of Andhra Pradesh power sector was assessed and plausible estimates on finances were made across the following aspects and channels:

- Budgetary allocations from the Energy Department, Government of AP
- Share of international loans in budgetary allocations from the Energy Department
- Internal and Extra Budgetary Resource (IEBR) reimbursement to AP through Central PSUs in the power and renewable energy sector
- Finance Commission Grants (if any) with respect to clean energy

Different channels of energy financing



Methodology

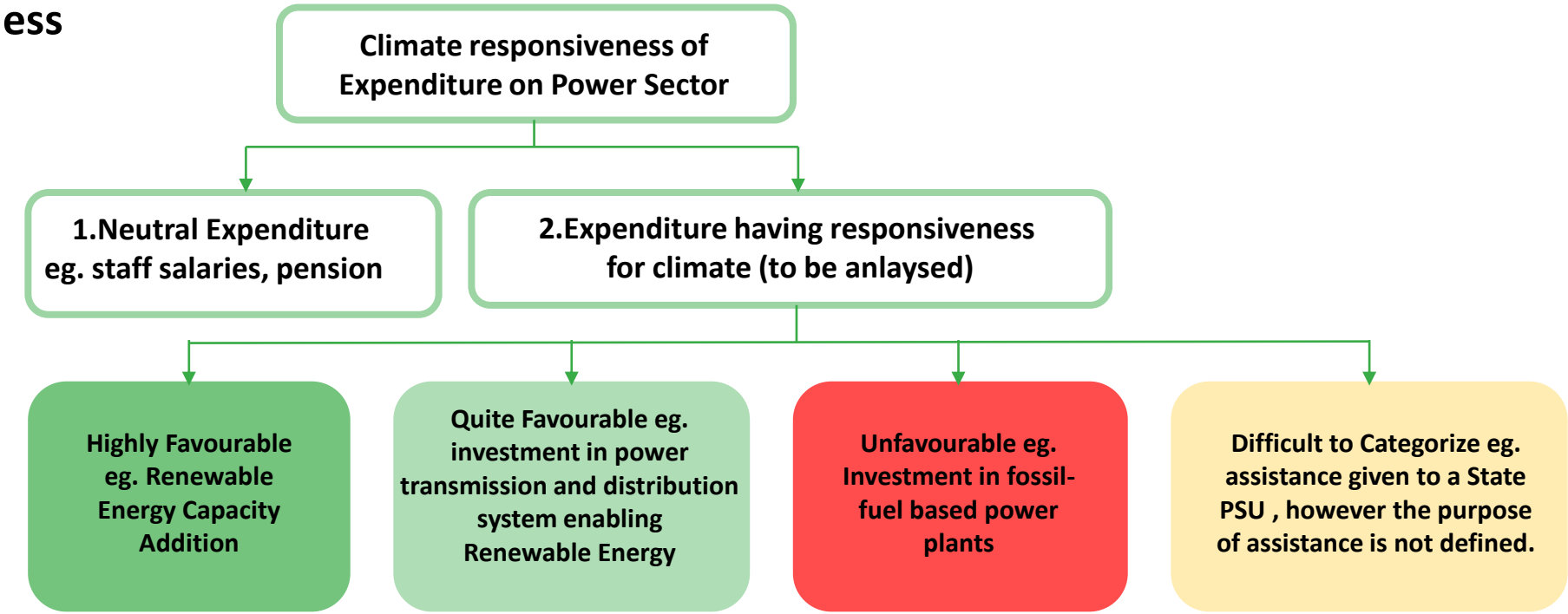
Understanding the coherence of State Budgetary Expenditure in reaching a clean energy transition to make progressive budget decisions to leverage climate financing: categorisation framework

Climate Responsiveness Categorization

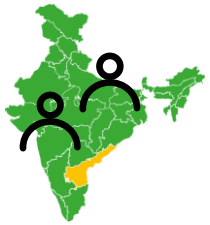
Step 1: Identification of key department(s) for power sector

Step 2: Identification of Budget lines that is, neutral or "with climate mitigation responsiveness"

Step 3: Rating the responsiveness of budget expenditure for Climate Change Mitigation (clean energy transition)



Andhra Pradesh at a Glance (2018)



Population and Area share

3.94% of India's population
4.96% of India's area

Population Density (Persons/km2)

Andhra Pradesh 318.7 | India 401.48

Forest Area

18.08% of Andhra Pradesh's Total Area
4.13% of India's Forest Area

GDP

4.49% of India's GDP

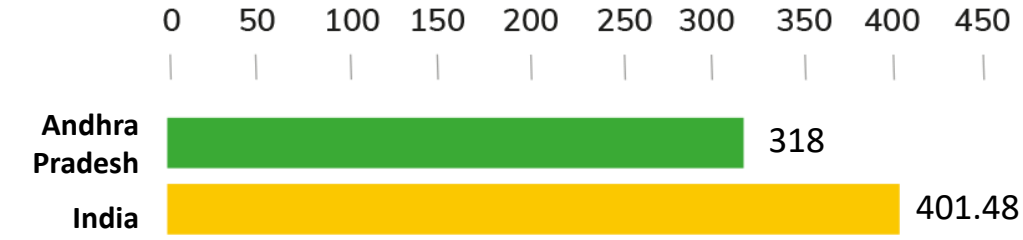
Net GHG Emissions

Andhra Pradesh

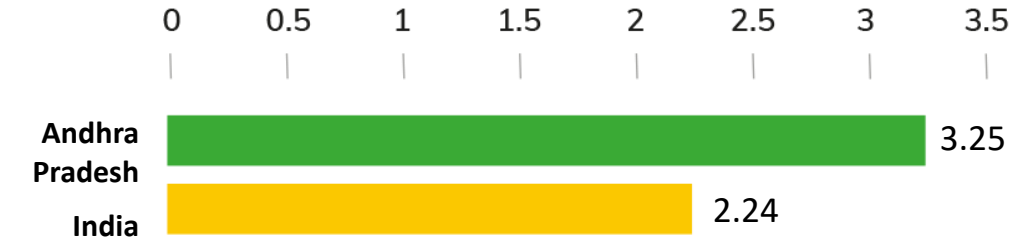
168.80 Mt CO2e
5.72% of India's emissions

Mt CO2e: Million tonnes of carbon dioxide equivalent

Population Density (Persons/km2)



Per Capita emissions (t CO2e/capita)

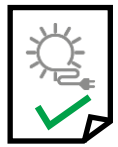


Issues for implementing GER in Andhra Pradesh

- Clean energy addition in the state is inadequate
- State budgetary provisions for clean energy
- Program planning for clean energy addition
- Cohesiveness of clean energy policies
- Financing of clean energy to state through other channels
- Social sector improvement through job creation

Major Issues

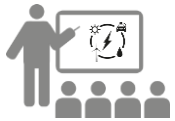
Landscape of efforts, budgets and policies for GER of Andhra Pradesh



Solar polices need to be exclusively implemented in the state. So far, state is following central scheme like Kusum Scheme.

No designed programmes for low carbon development of Urban Development sector.

Planning for Green Budget of Andhra Pradesh is ex-post only and not adjusted to immediate requirement for clean energy transition.



Skilling programs not focusing on green jobs.

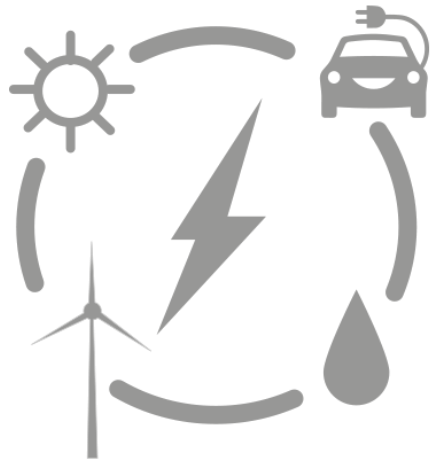
Current Energy Mix in Andhra Pradesh

Installed Capacity (MW)

	Renewable Energy	Hydro Power	Nuclear Power	Thermal Power	Total
2019	8,074	1,674	127	14,644	**24,518**
2021	9,191	1,674	127	14,714	**25,706**
2022	11,005	1,674	127	14,714	**27,520**

Share of Installed Capacity (%)

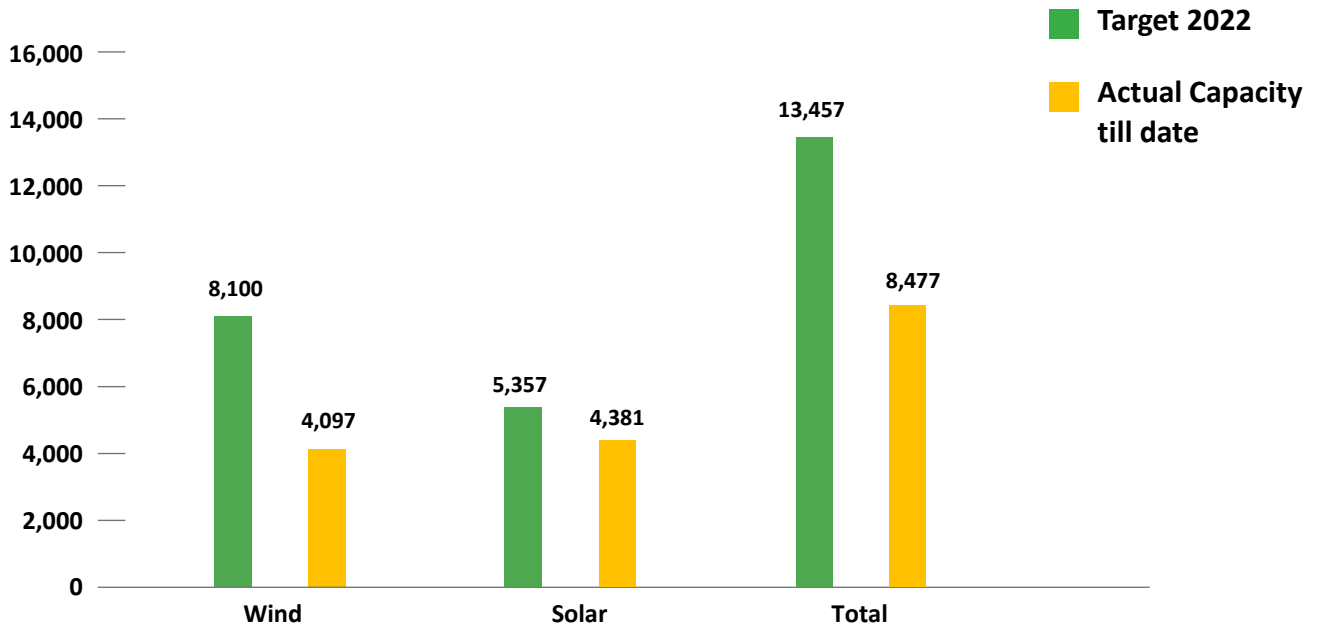
	Renewable Energy	Hydro Power	Nuclear Power	Thermal Power
2019	32.9	6.8	0.5	59.7
2021	35.8	6.5	0.5	57.2
2022	40.0	6.1	0.5	53.5



Source: CEA data, 2019, 2021, 2022

Issue: State unable to meet its RE targets

Target vs Actual Capacity in the renewable energy sector MW (Wind and Solar)



A 2022 NITI Aayog study suggests that Andhra Pradesh has only reached 4% of its total renewable energy potential. Solar and wind energy sectors in Andhra Pradesh have very high potential - 38.5 GW and 44 GW respectively, according to the MNRE. The figure shows the target vs actual capacity where Andhra Pradesh is still 4,978 MW short.

Source: NITI Aayog, CEA 2022

Issue: State is heavily dependent on loans for its transmission and distribution network

The Budget of Andhra Pradesh's Energy department is estimated to be Rs. 10,281 crores for FY 2022-23 (BE), out of which 700 crores (7%) has been used as loans.

Major Head: 6801-LOANS FOR POWER PROJECTS

Sub-Minor Head	2018-19 A	2019-20 A	2020-21 A	2021-22 BE	2021-22 RE	2022-23 BE
05- Loans to APTRANSCO for Servicing loans taken by the DISCOMS	0.0	4689.7	0.0	0.0	0.0	0.0
07- Loans to APTRANSCO for High Voltage Distribution System (HVDS)	0.0	0.0	0.0	0.0	0.0	0.0
07- Loans to APTRANSCO for High Voltage Distribution System (HVDS)	0.0	0.0	0.0	0.0	0.0	0.0
11- WB & AIIB (World Bank & Asian Infrastructure Investment Bank) - Loans for APTRANSCO for 24X7 Power for all Project	184.6	100.2	95.9	300.0	680.5	543.1
11- WB & AIIB (World Bank & Asian Infrastructure Investment Bank) - Loans for APTRANSCO for 24X7 Power for all Project	40.7	10.1	0.0	18.4	0.0	119.6
11- WB & AIIB (World Bank & Asian Infrastructure Investment Bank) - Loans for APTRANSCO for 24X7 Power for all Project	12.7	13.1	0.0	57.6	8.3	37.3
13- KFW - Germany - Green Energy Corridors Intra State Transmission System in Andhra Pradesh	62.4	0.0	0.0	22.1	197.6	0.0
13- KFW - Germany - Green Energy Corridors Intra State Transmission System in Andhra Pradesh	0.0	0.0	0.0	4.5	4.5	0.0
13- KFW - Germany - Green Energy Corridors Intra State Transmission System in Andhra Pradesh	0.0	0.0	0.0	1.4	1.4	0.0
Total	300.3	4813.0	95.9	404.1	892.3	700.0

Source: Detailed Demand for Grants for Andhra Pradesh Energy Department (Energy Department, Andhra Pradesh Government 2021)

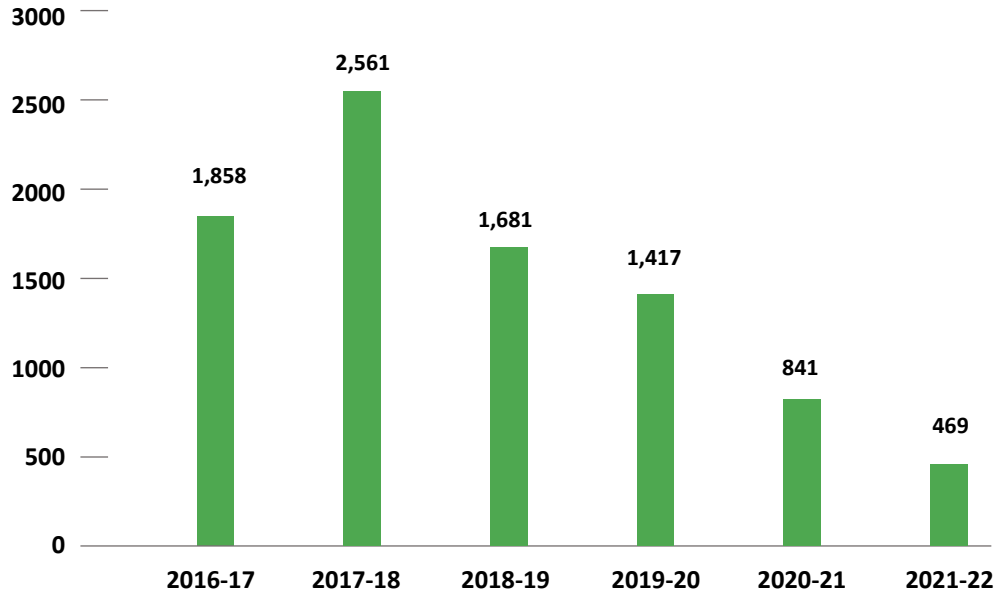
Issue: Support from other financing channels for clean energy transition

Huge dependence on loan component for building Transmission and Distribution infrastructure

Fund transfers from Central PSU- IREDA has been poor in Andhra Pradesh

No grants for renewable energy sector from Finance commission recommendations to any state

Disbursement through central PSUs such as Indian Renewable Energy Development Agency (IREDA) to Andhra Pradesh (Rs crore)

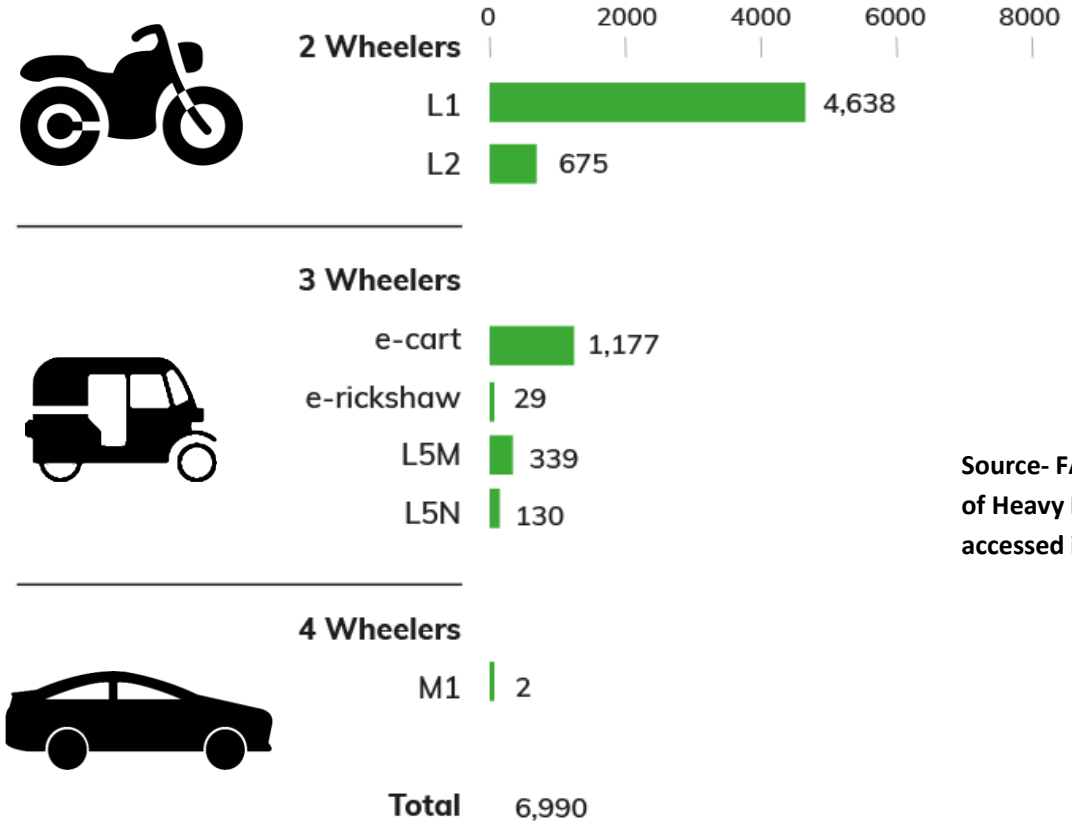


Source: IREDA Annual Report 2020-21

Issue: The EV sector should have a more conducive environment

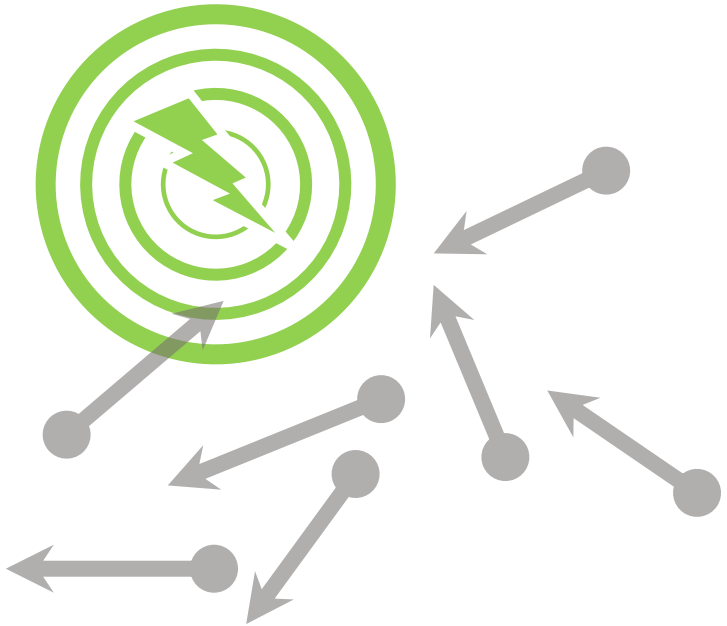
The Andhra Pradesh government passed the Electric Mobility Policy 2018-23 to promote electric vehicles (EVs). According to the policy, by 2024, one lakh EV charging stations will be built, all government buses and commercial vehicles will be made electric and Rs 30,000 crore would be invested by the State. The AP government also targeted to phase out fossil fuel based commercial and logistics vehicle by 2024.

Electric Vehicles in Andhra Pradesh by model



Source- FAME-II Ministry of Heavy Industries portal accessed in January 2022

Issues: Climate Responsive Budgeting landscape and Policies



Andhra Pradesh does not have a separate climate budget or SDG budget. Even the state action plan for climate change has not been updated since 2012. Climate Responsive Budgeting landscape (CRB) has been neglected in states financing.

Most of the existing policies in the Andhra Pradesh are not defining the co-benefits of stipulated climate mitigation actions

Issues: Climate Responsive Budgeting landscape and Policies

RE Export Policy: Andhra Pradesh Renewable Energy Export Policy (2020)

- Power generated from solar and wind projects would be exported outside the State.
- Resource allocation on a “first-come, first-serve” basis by the Nodal Agency by seeking online applications.
- Priority will be given to project developers intending to set up energy export projects along with manufacturing facilities in the State.

Solar: Andhra Pradesh Solar Power Policy-2018

- To achieve a minimum total solar power capacity addition of 5,000 MW in the next five years in the State with a view to meet the growing demand for power in an environmentally sustainable manner.
- To develop solar park(s) with necessary utility infrastructure facilities to encourage developers to set up solar power projects in the State.
- To deploy solar-powered agricultural pump sets to meet power requirements of farmers.
- To promote local manufacturing facilities which will generate employment in the State.

Wind: Andhra Pradesh Wind Power Policy-2018

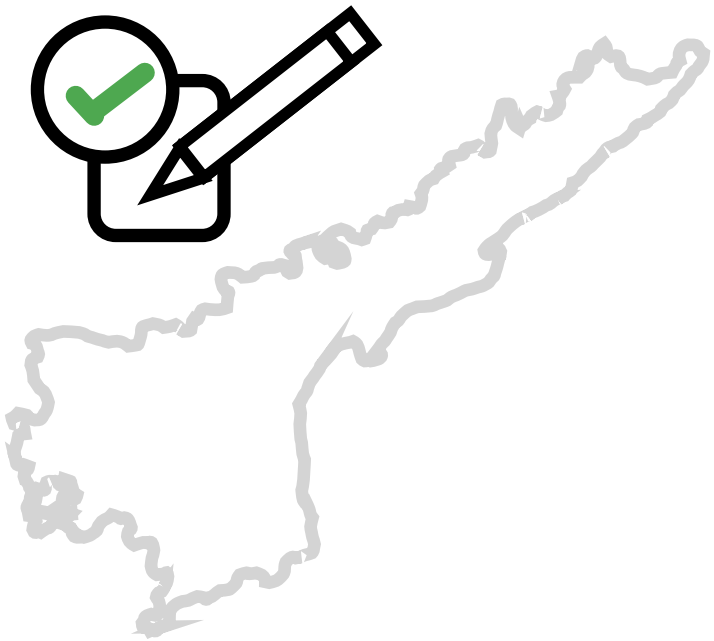
- To encourage, develop and promote wind power generation in the State with a view to meet the growing demand for power in an environmentally and economically sustainable manner.
- To attract private investment to the State for the establishment of large wind power projects.
- To promote investments for setting up manufacturing facilities in the State, which can generate gainful local employment.

Solar-Wind: Andhra Pradesh Wind-Solar Hybrid Policy - 2018

- To achieve renewable energy capacity of 18000 MW by the year 2021-22.
- To provide a framework for the promotion of large grid-connected wind-solar PV systems for optimal and efficient utilisation of transmission infrastructure and land, reducing the variability in renewable power generation and thus achieving better grid stability. Offered incentives are;
- 50% of the cross-subsidy surcharge shall be paid for third party sale provided the source of power is from wind-solar hybrid power projects setup within the State.
- Transmission/distribution charges are exempted up to 50% of the applicable charges for wheeling of generated power.

Policy Suggestions for Green Economic Recovery of Andhra Pradesh

Overview: Policy Suggestions



The COVID-19 pandemic has affected multiple sections of the state. To recover in a sustainable manner, the state has to take a more holistic approach and be more inclusive and transparent in its Green budget finances.

Capital investment and infrastructure in the renewable energy sector would be of no use if the State does not have enough skilled and trained individuals. Hence upskilling is also of great importance.

The Government of Andhra Pradesh funds the majority of off-grid renewable energy projects, such as solar water heating systems, upgraded chullahas, and other solar energy projects, like solar lights and solar pumps.

Policy Suggestions

1. State need to priorities the renewable energy sector spending as highly favourable for GER transition and need for phasing down unfavourable expenditure

Categorisation of Power sector budget according to their favourability

By amount (Rs crore)

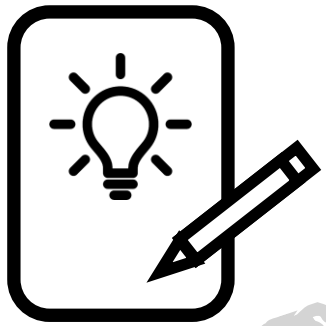
Categories	2017-18 A	2018-19 A	2019-20 A	2020-21 A	2021-22 BE	2021-22 RE	2022-23 BE
Highly Favourable	312.0	65.7	3.6	4,047.9	4,532.5	8,794.9	4,500.0
Quite Favourable	378.9	829.5	6,676.6	1,481.0	1,914.5	1,792.4	3,788.0
Neutral	32.9	42.7	93.6	654.8	190.2	2,181.1	1,993.0
Unfavourable	3,000.0	1,250.0	4,919.8	0.0	0.0	0.0	0.0
Total	**3,723.8**	**2,187.9**	**11,693.7**	**6,183.8**	**6,637.2**	**12,768.3**	**10,281.0**

By share (%)

Categories	2017-18 A	2018-19 A	2019-20 A	2020-21 A	2021-22 BE	2021-22 RE	2022-23 BE
Highly Favourable	8.4	3	0.03	65.5	68.3	68.9	43.8
Quite Favourable	10.2	37.9	57.1	23.9	28.8	14	36.8
Neutral	0.9	2	0.8	10.6	2.9	17.1	19.4
Unfavourable	80.6	57.1	42.1	0	0	0	0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Detailed Demand for Grants for Energy Department, Government of Andhra Pradesh

Policy Suggestions



2. State can develop a framework for creation of livelihood from Decentralised Renewable Energy (DRE) technologies and capacity building of local population for livelihood in clean technologies.

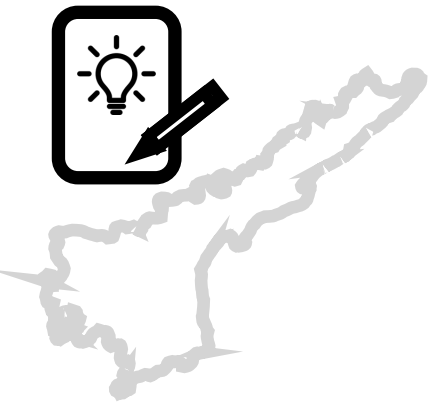
Decentralised/off- grid Renewable Energy (DRE) powered livelihood solutions have the potential to reduce and eventually eliminate the reliance of livelihood on diesel, particularly in rural settings, and can supplement the grid supply. Apart from creating jobs, these applications would help in achieving self-reliant which is important for inclusive and green economic recovery of AP

3. State needs to explore new climate finance mechanisms like green bonds for investing in transmission and distribution network.

Andhra Pradesh is heavily dependent on external loans for transmission and distribution network. Often this increase the burden on state finances due to the requirement of co- financing by the grantee state. Currently, high Transmission and Distribution (T&D) losses are proving debacle for private investment in RE sector. AP should explore new climate finance mechanisms like Green Bonds for leveraging investment in transmission and distribution infrastructure in association with technical assistance from IREDA and MNRE.

Policy Suggestions

4. State can develop a framework for creation of livelihood from Decentralised Renewable Energy (DRE) technologies and capacity building of local population for livelihood in clean technologies



Andhra Pradesh government spending on fuel-based public transport (Rs. crores)

Department: Transport, Roads and Buildings

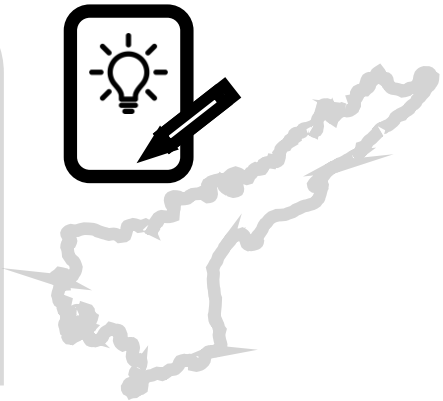
2017-18 BE	2017-18 A	2018-19 BE	2018-19 A	2019-20 BE	2019-20 A	2020-21 BE	2020-21 RE	2021-22 BE
Sub-Minor Head: 43- Assistance to (APSRTC)								
Detailed Head: 310- Grants-in-Aid								
0	0	150	120	50	50	0	0	0
0	0	50	40	0	16.67	0	0	0
0	0	200	160	50	66.67	0	0	0
Sub-Minor Head: 05- Loans to (APSRTC) for purchase of buses								
Detailed Head: 001- Loans to APSRTC for purchase of buses								
230	230	0	0	0	0	0	0	0
0	19	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
239	249	0	0	0	0	0	0	0

Source: Detailed Demand for Grants for Transport, Road and Buildings Department, Government of Andhra Pradesh

Policy Suggestions

5. State should boost its skilling program in order to generate more green jobs.

A boost in the State's skilling program in renewable energy sector is needed and in the initial stages, the Andhra Pradesh government could take help from the centre or follow the models used by states like Bihar, Odisha that have successfully implemented such programs.



Existing skilling programs that can be focused for GER:

Pradhan Mantri Kaushal Vikas Yojana (PMKVY)

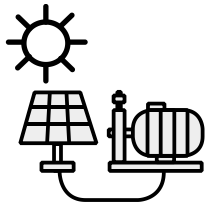
Suryamitra Skill Development Programme (SSDP)

PM Kusum Yojana

Small Hydro Power Programme

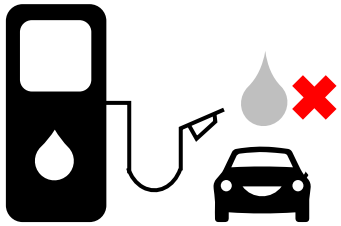
Recommendations

The state also should have a **dedicated climate budget** where clean energy financing could be focused keeping the goal of climate mitigation in mind. A Climate Responsive Budgeting (CRB) landscape will initiate the green economic development of the state and guide the state finances in a coordinated and well-structured manner.



Solar projects are vital to achieving clean energy targets, but there needs to be a holistic approach to involve them in the State's schemes. For example, the State's decision to augment the capacity of solar power by offering it under the YSR Nine-Hour Free Power Supply Programme for farmers.

There could be a **greater transparency in State climate finance data**. It has been seen that clarity on available finances, their specific objectives and conditions increase investor confidence and lead to better utilisation of available finances.



In the initial phases of EV penetration, Government should 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.

Thank You

Work presented is from Policy brief:

Andhra Pradesh's Policy and Budgetary Priorities for Transitioning towards Green Economic Recovery

Authors: Subrata S. Rath and Jyotsna Goel

About Project:

Building Knowledge and Capacity for Green Economic Recovery of the States in India

The project is meant to build knowledge and capacity for facilitating the green recovery of the State economies in India, following the sharp economic downturn due to the COVID-19 pandemic. The research will help in developing knowledge resources and recommendations that State Government actors could refer to for incorporating climate mitigation actions under their economic revival measures.

Contact: ssrath@cbgaindia.org and info@cbgaindia.org