

A Factsheet

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

2022



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Year of Publication: January 2022

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

About Factsheet: The factsheet highlights Bihar state's current efforts for financing climate change mitigation actions in various sectors such as; power, agriculture, transport and urban development. It identifies policy measures for long-term transformation towards green economic recovery.

This factsheet is prepared under the Project:

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



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The Context

Public Policy design is critical as a poorly designed recovery process will be ineffective in delivering desired social, economic and climate outcomes. It is important to take an economic recovery pathway that is in sync with sustainable development objectives and make the economy strong enough to withstand any sudden shocks (pandemic or climatic). There is a need to bring into public discourse evidence-based research on how to mainstream climate concerns in designing developmental actions and follow low-carbon developmental pathways. There is also a need to look at how to align climate policy and its financing for socio-economic development and bring in equity and inclusion. A lot of rethinking is happening -nationally and internationally – on avoiding economic practices that are detrimental to the environment and on keeping climate change in focus during an economic recovery.

The current coronavirus (COVID-19)-induced crisis offers governments, especially state governments, a critical opportunity to develop a new growth strategy that transforms the economy into one that is resilient, protective of nature, low-carbon, and resource-efficient. Any strategies to green the economic recovery will have different starting points due to prevailing social, economic and environmental contexts that vary in the federal structure of governance in India. In order to have deeper insights and pointers for policymakers and other stakeholders for climate financing and delivery reform at the subnational level, a baseline assessment of state budgets is made to assess their responsiveness to climate mitigation actions and how their public policies prioritise concerns over equity and inclusion while implementing climate mitigation interventions or policies.

This particular factsheet presents an assessment of public financing in the state of Bihar, in eastern India,

for a clean energy transition as a transition is critical in greening the economic recovery. It presents public finance data (budget expenditure) and incentives offered under various state policies on Low Carbon Development (LCD) to various sectors of the economy in Bihar. These include interventions such as addition of Renewable Energy (RE) capacity, Energy Efficiency, increasing the share of electric vehicles in the transport system, as well as low-carbon urban development and infrastructure in Bihar. In particular, the factsheet looks at the clean energy transition in the power sector since energy is the main driver for socio-economic development of any state as most industrial activity, agriculture productivity, domestic consumption and dwellings depend on energy and power supply. However, fossil fuel-based energy is the largest contributor to GHG emissions from Bihar. A detailed methodology note has been prepared to assess the responsiveness of Bihar's power sector budget to climate change mitigation. This holds significance for future assessments against other states' priorities for climate mitigation actions and highlights immediate actions needed by governments for the sector.

We have also studied the temporary reduction, if any, in Bihar's total budget expenditure (TBE) and allocations for the energy sector due to the economic downturn caused by the COVID-19 pandemic. There is a lack of disaggregated budget data and provisioning (in terms of budget allocations for programmes and schemes) for clean energy, clean fuel utilisation, and energy efficiency-related initiatives in sectors other than electricity generation (such as, transport, urban development and agriculture), and so, we have made an attempt to analyse the priorities of existing policies/ strategies/ programmes and schemes by the Bihar government through surveys of secondary literature.



clean fuel utilisation, and energy efficiency-related initiatives in sectors other than electricity generation (such as, transport, urban development and agriculture), and so, we have made an attempt to analyse the priorities of existing policies/ strategies/ programmes and schemes by the Bihar government through surveys of secondary literature.

The factsheet also covers public policy priorities in skilling youth for climate mitigation interventions as part of a strategy to build a cohesive environment for climate investors. Various suggestions have been made for integration of equity and inclusivity concerns for the Bihar climate change mitigation

policy landscape. It presents an analysis of skilling efforts by the Bihar government in various sectors and how these efforts can be aligned to harness the green jobs opportunity, particularly by renewable energy sector workers such as solar plant operators, maintenance technicians etc. It also looks at the creation of clean energy-based livelihoods (such as the establishment of small shops on domestic or off-grid-based solar technologies) and other green businesses led by vulnerable sections of the population etc. We have made an attempt to present the public financing priorities in skilling for green jobs and the creation of green business-based livelihoods.





Section I

Goals and Objectives

Given the above context, the goal of this factsheet is to present the on-going efforts of the Bihar Government for a clean energy transition, and to identify issues in the transition towards a Green Economic Recovery (GER). The objectives are:

- 1 To track the financial resources available with Bihar from various sources, for expenditure on clean energy initiatives
- 2 To understand the responsiveness of State Budgetary Expenditure towards a clean energy transition in order to lay down progressive budgetary provisions aimed at greening the economic recovery

- 3 To understand starting points for a long-term transformation towards a clean energy-based economy, and to assess the impact of the COVID-19 pandemic on the state's overall spending priorities on various sectors, including energy

- 4 To present a policy and institutional landscape assessment of climate mitigation policies in the energy, transport and urban development sectors in Bihar and also to assess the state's participation in various national climate change mitigation programmes





Section II

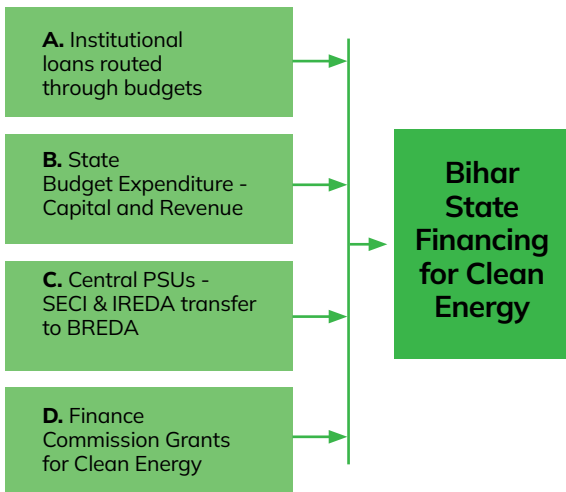
Scope and Methodology

2.1 Methodology to track the financial resources available with Bihar from various sources, for expenditure on clean energy initiatives (Objective 1)

Bihar’s Financial Resource Envelope for Power sector financing was assessed and a plausible estimate on finances was arrived at across the following aspects and channels;

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

Figure 1: Different channels of energy financing



Key sources of information:

- Budget Documents of various State Departments
- International loans Routed through Departmental Budgets
- Annual Reports pertaining to Energy of Central PSUs such as Solar Energy Corporation of India (SECI) and Indian Renewable Energy Development Agency (IREDA) for reimbursements to Bihar’s State Owned Enterprises, such as BREDA, as IEBR support
- Recommendations of the Fourteenth and Fifteenth Finance Commission and sections pertaining to Renewable Energy (if any), as well as Budget transfers to the Bihar Government appearing in State or Union Budget Documents for renewable energy (if any)

Limitations: There is a possibility of double counting due to there being various channels of financing such as IREDA reimbursement transfers and MNRE grants to the state for promotion of renewable energy. It was difficult to assess and distinguish the conditional and unconditional grants-in-aid being provided by the Union Government to the State solely through State budget expenditure data.

2.2 Methodology to understand the responsiveness of State Budgetary Expenditure towards a clean energy transition. (Objective 2)

An assessment is carried out on the conduciveness of the State Energy Sector’s Expenditure Budget towards promotion of renewable energy by classifying expenditure. Expenditure budget lines



with five tiers of budget information were analysed for their coherence with national targets for Clean Energy and the financial support provided for a clean energy transition. The subsequent section provides the methodological steps followed, definitions and rationale for assignment of categories to budgetary expenditure. Several steps were involved in assessing the climate responsiveness of budgets. Of these, three major steps were:

1) Identification of the scope of expenditure in terms of identifying the department mandated with power sector development. At the scoping stage, it identifies expenditure items (pertaining to nodal departments) that are to be included and filters those that are out of scope. Only the expenditure budget is kept within the scope of analysis and in the case of Bihar, it is the Energy Department that delivers power sector-related interventions

2) Identification of Budget lines that is, neutral or “with climate responsiveness” in terms of identifying the budget lines which ‘with climate responsiveness’ and expenditure items that are described as ‘neutral’. Then, expenditure items ‘with climate responsiveness’ are analysed in depth, most often by analysing supplementary information in addition to budgetary or financial data. There are five tiers of information in Budget accounts: Major heads, Sub-major heads, Minor Heads, Detailed Heads and Object Heads. Segregation of budget lines into the “with climate responsiveness” or “neutral” category is carried out by unifying the information lying in these five tiers of information (by concatenating them). The criteria used to identify the budget lines as “neutral” or “with climate responsiveness” are as follows:

1. Neutral: This expenditure does not have a significant responsiveness towards emissions or in capturing greenhouse gases. It therefore does not actively contribute to climate change, nor does it help reduce GHG emissions. Examples: social benefits to employees, salaries, administration travel,

recoveries and food allowances.

2. With climate responsiveness: This expenditure is compatible with a national ambition for climate change mitigation, particularly for Renewable Energy. It leads to a significant reduction in emissions compared to existing alternatives. For example, Addition of Renewable Energy, Transmission and distribution network, Electrification using off-grid technologies etc.

3) Analysis of Priorities for expenditure “with climate responsiveness”: The aim of this third stage of analysis is to identify the climate responsiveness of all the expenditure included in the budget of the Power Department of State Governments. It consists of an analysis of the budget line by line, based on rationale-based categorisation of actions. The actions are then rated as Highly favourable, Quite favourable, Unfavourable or Undefined for climate. The results provide a better understanding of the coherence of expenditure in achieving a clean energy transition, and thereby help in making progressive budget decisions for a green economic recovery. Expenditure items are classified into three categories according to their responsiveness on climate needs:

- i. Highly Favourable:** This expenditure is in line with the national ambition for climate change mitigation. Expenditure on this activity leads to a significant reduction in emissions compared to existing alternatives. For example: Installation of Renewable Energy Capacity
- ii. Quite Favourable:** This expenditure reduces emissions in the short term, but the reduction is insufficient to put the area on the path to low-carbon development. This category notably includes equipment and infrastructure that present a risk of carbon lock-in the long term. For example: Transmission and distribution networks

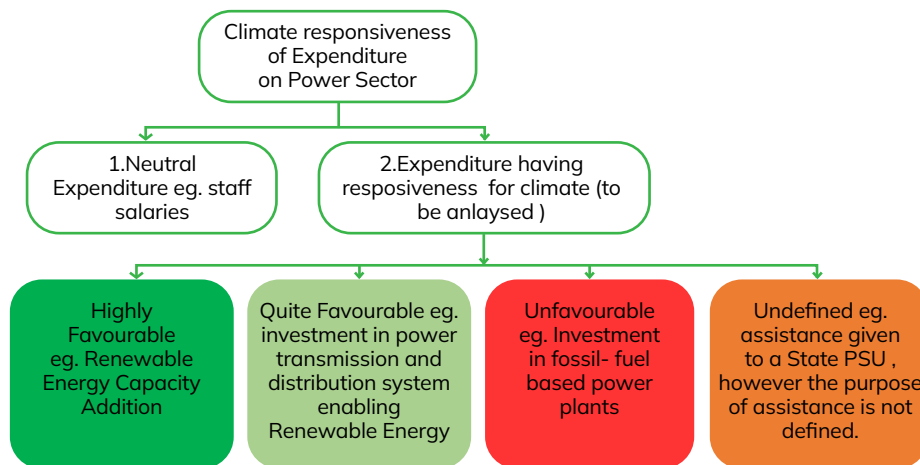


Figure 2: Climate Responsiveness Categorization

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)



iii. Unfavourable: This expenditure is not in line with India’s commitment to mitigate climate change because it makes a significant contribution to greenhouse gas emissions. For example: Subsidies for diesel-based pumps or fossil fuel-based power generation

iv. Undefined: This expenditure does not fit into any of the above three categories, as it requires extra-budgetary supplementary information and needs to be discussed with the State Government.

Users can see the application of the above methodology in the appended EXCEL file as Annexure A.

2.3 Methodology to understand the impact of the COVID-19 pandemic on the state's overall expenditure, and the starting points for a long-term transformation towards a clean energy-based economy (objective 3)

A trend analysis has been carried out of Bihar’s Total Budget Expenditure (TBE) covering the post-and pre-COVID years for various departments. The state’s overall physical progress on targets such as Renewable Energy and other outcome indicators through implementation of various policies in and

regulation of the power sector is also collated.

Key sources of information:

- Bihar State Economic Survey
- An online portal-GHG-platform India, for information on Green House Gas Inventory for various Sectors of Bihar’s Economy
- State Budget Documents and Detailed Demand for Grants (DDGs) for the Energy Department from financial years 2017-18 to 2021-22
- MNRE data on state-wise physical progress on state-wise targets pertaining to Renewable Energy
- Status of Bihar’s Renewable Energy Purchase Obligation
- Annual Transmission and Distribution Losses

Limitations: Data available for Bihar on GHG inventory is till 2015 only and a mere time series analysis projection till 2021 does not factor in the COVID-19 pandemic’s impact, such as a temporary decline in GHG emissions that might have taken place during the lockdown.



It is difficult to firmly say whether the decline in the share of Energy Department spending is due to stress in the state's finances or a shift in priorities towards social welfare without a sectoral analysis and clear bifurcation of Total Budget Expenditure across sectors.

2.4 Approach followed to present the policy and institutional landscape of climate mitigation policies in the energy, transport and urban development sector, and to assess Bihar's participation in national programmes with climate mitigation objectives (Objective 4)

Bihar's overall progress on targets such as renewable energy and other outcome indicators through the implementation of the Renewable Energy policy were collated. The state-level institutional and policy assessment for the promotion of renewable energy is presented. Interventions and policies were assessed in terms of their ability to augment strategies for low-carbon development in sectors such as energy, transport and urban development. In the transport sector, state policies, programmes and schemes for the promotion of public transit systems and electric mobility (if any) were collated. State spending under specific programmes and schemes, with the specific possibility of mainstreaming climate mitigation interventions in urban development sector, was also studied. In the energy sector, the key attributes of the Bihar Renewable Energy Policy were highlighted as a ready reckoner for policy makers. The state participation status in central schemes meant for the promotion of electric vehicles, energy efficiency and solar pumps was also assessed. The budgeted schemes of the Bihar Skill Development and Social Welfare Department were studied for an understanding of the up-skilling efforts (if any) for jobs in renewable energy and other climate mitigation sectors such as electric mobility.

The key sources of information are: Bihar State Renewable Energy Policy

- Bihar Electric Vehicle Policy

- Disaggregated budgeted information on programmes and schemes with climate relevance as available
- Union government guidelines for mainstreaming climate concern in SMART Cities Mission
- Central government guidelines under specific programmes to promote electric vehicles and solar pumps, such as the FAME-II scheme and PM KUSUM
- Central scheme-specific portals providing information on state-wise performances. This is available for FAME-II, KUSUM, and energy efficiency-related schemes.
- The Budget document of the Bihar Skill Development and Social Welfare Department
- The Bihar State Skill Development Mission strategic document
- Bihar government orders
- News media articles

Limitations: There is a lack of disaggregated budget data and data on provisions (in terms of programmes and schemes' budget allocations) for clean energy, clean fuel utilisation, and energy efficiency-related initiatives in other sectors such as transport, urban development and agriculture. Hence, we attempted to analyse the priorities of the existing policies, strategies, programmes and schemes through secondary literature surveys. While assessing the state performance under central schemes, it is not known if cross-sectional subsidies were given by the state for achieving the same targets as the national targets. The year of start of participation of the states with central schemes is not known and information is not available in the public domain. The cumulative information is provided till date on most of the national portals. The annual information on state-wise performances in central schemes is not available. There are certain schemes and programmes which are reported by the news media. However, it is difficult to assess the disaggregated budgeted information in various core schemes and programmes appearing in the departmental budget documents.



Section III

Results and findings

The following section presents the findings and results with the application of the above described methodologies against the four objectives of this factsheet.

Section I Tracking of Financial resource envelope with Bihar through various sources to fund a clean energy transition (Objective 1)

Section II Understanding the responsiveness of State Budgetary Expenditure towards clean energy transition (Objective 2)

Section III Assessment of the impact of the COVID-19 pandemic on the state's overall spending priorities on various sectors, including energy (Objective 3)

Section IV The institutional landscape of climate mitigation policies in the energy, transport and urban development sectors and assessment of state participation in key Union government schemes and programmes of climate relevance (Objective 4)

Section I: Tracking of Financial resource envelope with Bihar through various sources to fund a clean energy transition (Objective 1)

3.1.1: The state's budget resources for power sector financing

The Bihar Energy Department's budget is estimated as Rs 8,650 crore for FY 2021-22 (BE) for energy-related expenditure. Of this, Rs 83 crore is from loans and advances received from various institutions such

Figure 3A: Loans and advances from central institutions such as NABARD and Rural Electrification Company routed through the Bihar budget (Rs crore)

Major Head: 6801- Loans for power projects

	2017-18 A	2018-19 A	2019-20 A	2020-21 RE	2021-22 BE
0015- South Bihar Power Distribution Company Ltd. (Repayment of loan taken from Rural E. Co.)	6.6	13.8	14.9	14.0	15.0
0016- North Bihar Power Distribution Company Ltd. (Repayment of loan taken from Rural E. Co.)	7.9	27.3	25.0	26.4	25.0
0017- South Bihar Power Distribution Company Ltd. (Repayment of loan taken from Rural E. Co./ principal amount)	0.0	0.0	0.0	13.0	13.0
0018- North Bihar Power Distribution Company Ltd. (Repayment of loan taken from Rural E. Co./ principal amount)	0.0	0.0	0.0	25.5	10.0
0101- Loan to Bihar State Hydroelectric Corporation	0.0	15.3	11.7	10.0	20.0
0105- Loan to Bihar State Hydroelectric Corporation (NABARD)	0.0	0.0	0.0	10.0	0.0
0508- Transmission of Bihar State Power (holding) Company Ltd. and Distribution Project	209.9	100.0	0.0	0.0	0.0
Sub- Total	224.4	156.4	51.6	98.9	83.0

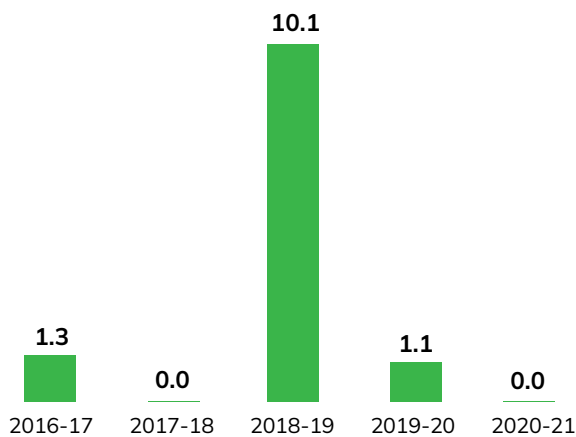
Source: Detailed Demand for Grants for Bihar State Energy Department (Energy Department, Bihar Government 2021)



Results and findings

as NABARD and Rural Electrification Company. In addition, the Bihar government received Rs 2.4 crore per annum on an average from central PSUs such as Indian Renewable Energy Development Agency (IREDA) between the years 2017-18 and 2020-21. There were no grants recommended for the

Figure 3B: Disbursement through central PSUs such as Indian Renewable Energy Development Agency (IREDA) to Bihar (Rs crore)

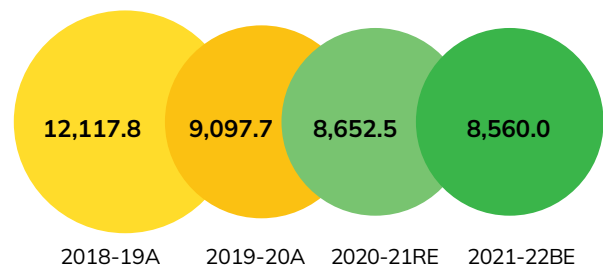


Source: IREDA Annual Report 2020-21

renewable energy sector for any of the states in the periods of the 14th and 15th Finance Commissions. Below are the approximate estimates from different channels of finances contributing to the state budget resources for expenditure on clean energy transition as presented in Figure 3A to Figure 3E.

Figure 3C: Budgetary allocation by the Bihar energy department (Rs crore)

Energy Department Budget



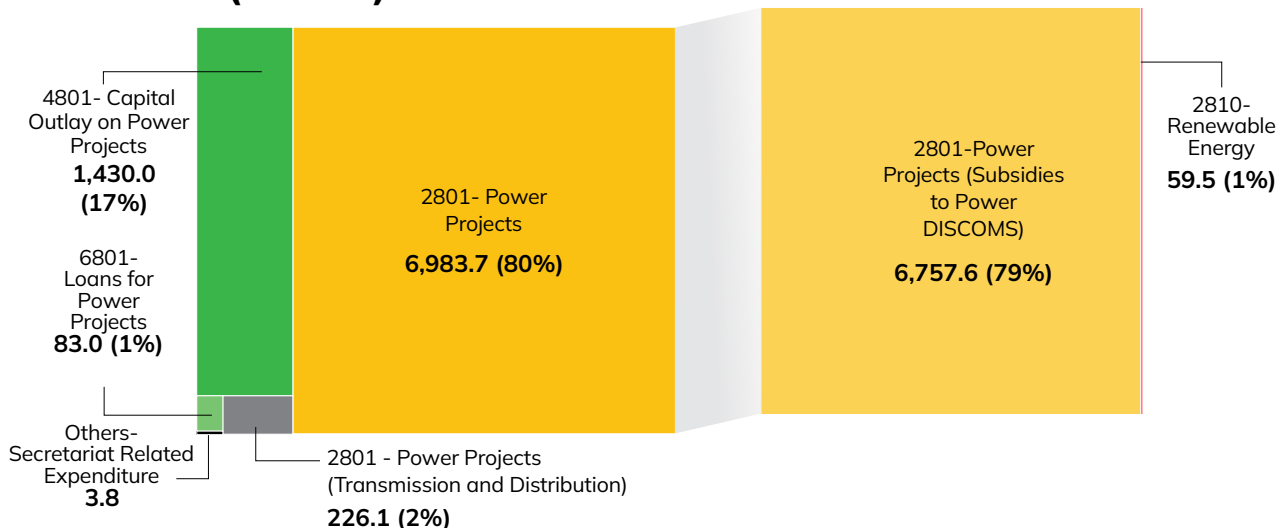
Source: Detailed Demand for Grants for Bihar State Energy Department (Energy Department, Bihar Government 2021)

Note: Above figures includes loan and advances as depicted in Figure 4.

Figure 3D: Finance Commission grants

There are no grants recommended for the renewable energy sector for any state in the reports of the 14th and 15th Finance Commissions.

Figure 3E: Bifurcation of budget of state power department for 2021-22 (Rs crore)





The bifurcation of budget of the state power department for 2021-22 shows that approximately 17 per cent of it is capital expenditure, 1 per cent of it is loan expenditure and 82 per cent of it is revenue expenditure. The department is spending a large share on subsidies to power distribution companies that is, Rs 6,984 crore as a part of its revenue expenditure.

Section II: Understanding the responsiveness or favourability of state budgetary expenditure towards clean energy transition (Objective 2)

3.2.1 Understanding the climate change (mitigation) responsiveness of the state power sector budget

It is important to understand the existing priorities of

public financing in Bihar in terms of climate change mitigation. An attempt is made to assess the responsiveness of the state budget for the power sector towards climate change mitigation using methodology coined by CBGA. We found through summation of category-wise expenditure that the expenditure towards the promotion of renewable energy is quite minuscule compared to the overall power sector budget of the state government, and hence the state needs to increase its focus on it. Below is the information on the category-wise budget expenditure (sub-total and percentage share) for climate change mitigation by the Bihar Energy Department.

There is an increase in the Bihar government's spending in the 'highly favourable' category from 2017-18 to 2021-22. This is largely due to an

Figure 4A and 4B: Bihar power sector budget expenditure responsiveness towards climate change mitigation

Figure 4A: Amount under various categories (Rs crore)

	Highly Favourable	Quite Favourable	Neutral	Unfavourable	Undefined	Total
2017-18 A	0.0	6,402.6	-64.8	1,292.5	3,832.5	11,462.8
2018-19 A	28.6	6,123.8	2.9	0.0	5,962.5	12,117.8
2019-20 A	46.6	3,107.2	-6.3	0.0	5,950.2	9,097.7
2020-21 RE	54.5	1,075.9	4.5	0.0	7,517.6	8,652.5
2021-22 BE	79.5	1,719.1	3.8	0.0	6,757.6	8,560.0

Source: Methodological Guidance Note

Note: Bifurcation of the negative value in some of the above categories like neutral can be seen in the annexure. The General Framework for Categorization of Expenditure for climate change mitigation responsiveness can be seen in Annexure 1 and the Excel file on the application of the methodology for categorisation of budget expenditure is available on the CBGA website

Figure 4B: Various categories' share in total expenditure (%)

	Highly Favourable	Quite Favourable	Neutral	Unfavourable	Undefined	Total
2017-18 A	0.0	55.9	-0.6	11.3	33.4	100.0
2018-19 A	0.2	50.5	0.0	0.0	49.2	100.0
2019-20 A	0.5	34.2	-0.1	0.0	65.4	100.0
2020-21 RE	0.6	12.4	0.1	0.0	86.9	100.0
2021-22 BE	0.9	20.1	0.0	0.0	78.9	100.0

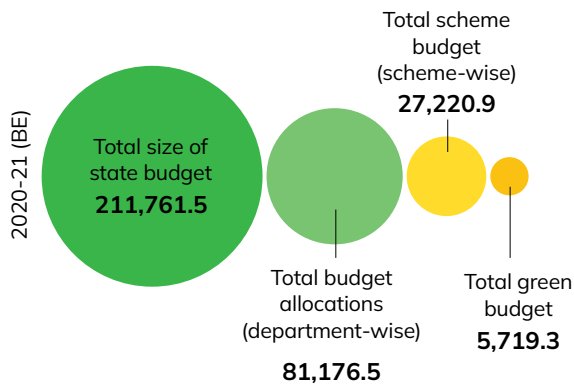
Source: CBGA-derived methodology

Note: The General Framework for Categorization of Expenditure for climate change mitigation responsiveness can be seen in Annexure 1. The Excel file on the application of the methodology for the categorisation of budget expenditure is available on the CBGA website. Please refer to the EXCEL file for (-) values



Figure 5: Green budget statement of Bihar, 2020-21 (Rs crore)

Outlay for green budget as % of total scheme budget: **7.05%**



Source: Bihar Green Budget, 2020-21

increase in subsidies for renewable energy-related programmes in 2021-22. Among the five categories, the 'undefined' category takes the largest share of budget expenditure. This is due to the non-availability of supplementary information from the power department to confirm any spending for grant-in-aid to state PSUs for the promotion of renewable energy. Transmission and distribution related projects are categorised in quite favourable category.

It is worth mentioning that the Bihar Green Budget 2020-21 has earmarked 7.05 per cent of the total

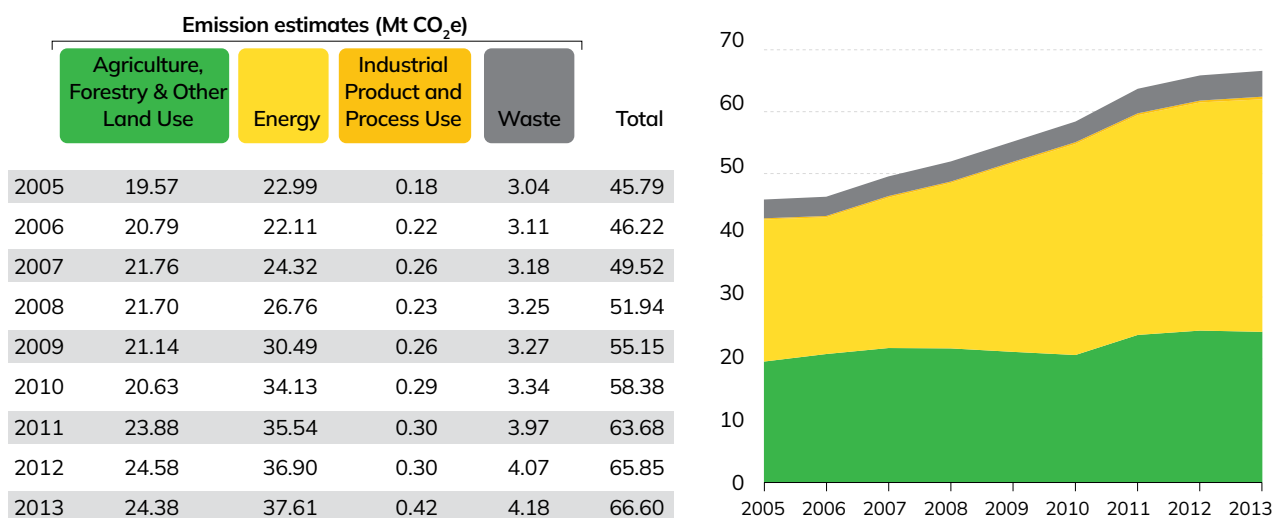
scheme budget for the implementation of several "green" objectives including clean energy transition. The Green Budget statement considered several objectives such as climate change adaptation, waste management, sustainable land use, pollution abatement, circular economy, biodiversity conservation and natural resource management besides the promotion of clean energy in Bihar. However, there are gaps in financing a road map for green economy recovery (Finance Department, Government of Bihar, 2021).

Section III: Understanding the impact of the pandemic on the state's overall spending and baseline indicators for a long-term transformation towards a clean energy-based economy (Objective 3)

3.3.1. Contribution of various sectors of economy towards GHG emissions in Bihar

GHG emissions in Bihar grew from 45.8 MtCO₂e to 66.6 MtCO₂e at an estimated compound annual growth rate of 4.79 per cent from 2005 to 2013, as depicted below. In 2013, the energy sector contributed 56 per cent of the total emissions in Bihar (GHG Platform India, 2019). A trend analysis on GHG emissions over these years suggests that the total GHG emissions might be 92.1 MtCO₂e in

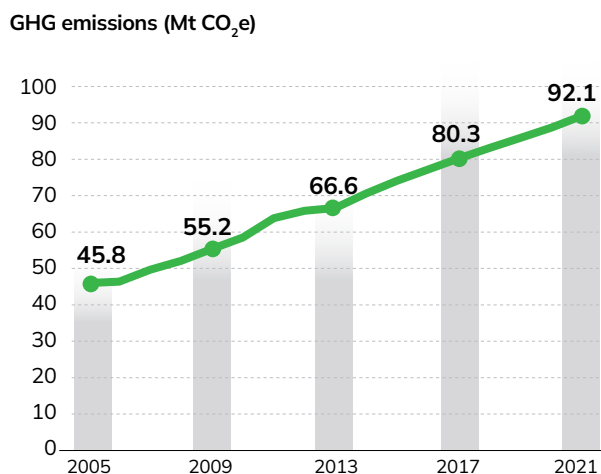
Figure 6A: Emission estimates for various sectors in Bihar



Source: GHG Platform India (2019)



Figure 6B: Trend analysis of Total GHG emissions from Bihar from 2005 to 2021 (MtCO₂e)



Source: GHG Platform India (2019)

2021. Hence, for greening the economic recovery of Bihar, a transition towards clean energy should be a major area of intervention, considering that the highest contribution to GHG emission is from the energy sector.

3.3.2 COVID -19 impact on budget expenditure for the power sector and other sectors

Figure 7: Trends in Bihar's total budget expenditure (TBE) for the energy sector

	Total state budget expenditure (Rs crore)	Power department budget (Rs crore)*	Power budget expenditure share in total state budget expenditure (%)
2018-19			
BE	1,76,990.3	10,257.7	5.80
A	1,54,655.4	12,117.8	7.84
2019-20			
BE	2,00,501.0	8,894.3	4.44
A	1,43,613.7	9,097.7	6.33
2020-21			
BE	2,11,761.5	5,560.2	2.63
RE	2,25,458.1	8,652.5	3.84
2021-22			
BE	2,18,302.7	8,560.0	3.92

Source: CBGA's analysis of Bihar State Budget Documents;* Detailed Demand for Grants for Bihar State Energy Department (Energy Department, Bihar Government 2021)

Notes: Abbreviations Used; BE= Budget Estimates, A= Actuals, RE= Revised Estimates

With the outbreak of COVID-19, Bihar recorded a negative growth (-18.2 per cent) in the first quarter of fiscal year 2020-21(Bihar Government, 2020). In absolute terms, the negative impact is substantial for a state like Bihar. The percentage share of power sector spending in the state's total budget expenditure (TBE) considerably reduced to 3.84 per cent in 2020-21 (RE) from 7.84 per cent in the actual estimates of 2018-19 (Bihar Government, 2021 and Energy Department, Bihar Government, 2021). This decline may have long-term consequences for the power sector and further derail financing for clean energy transition.

The total budget expenditure of different departments and their percentage share in the state's total budget expenditure (TBE) from 2018-19 (BE) to 2021-22(BE) is studied. It reveals that the allocations for various departments follow a set pattern with very few changes. The only exception is the Energy Department, where the percentage share has actually decreased in 2021-22 (BE) from the pre-COVID year of 2018-19 (BE). The reduced percentage share post-COVID for the energy sector might be due to a shift in priorities for immediate pandemic relief measures.



Figure 8: Trends in total budget expenditure of different departments and their percentages

	Amount (Rs Crore)			Share in State's total budget expenditure (%)	
	Bihar total budget expenditure	Urban Development and Housing Department	Water Resources Department	Urban Development and Housing Department	Water Resources Department
2018-19					
BE	1,76,990.3	4,413.6	3,497.4	2.49	1.98
A	1,54,655.4	3,247.8	2,829.9	2.10	1.83
2019-20					
BE	2,00,501.0	5,158.8	3,652.3	2.57	1.82
A	1,43,613.7	3,144.5	948.4	2.19	0.66
2020-21					
BE	2,11,761.5	7,213.7	4,053.6	3.41	1.91
RE	2,25,458.1	7,213.7	4,509.6	3.20	2.00
2021-22					
BE	2,18,302.7	7,767.1	4,074.4	3.56	1.87

Source: Detailed Demand for Grants for various departments in Bihar

3.3.3 Progress achievement in renewable energy capacity addition

Bihar unveiled a new and renewable energy policy in 2017, but the targets envisaged under it are far from being achieved. The policy aimed to boost the clean energy sector and reduce dependency on coal power. It set a target of 3,433 megawatts (MW) of renewable energy by the end of 2022, including 2,969 MW from biomass and 220 MW from small

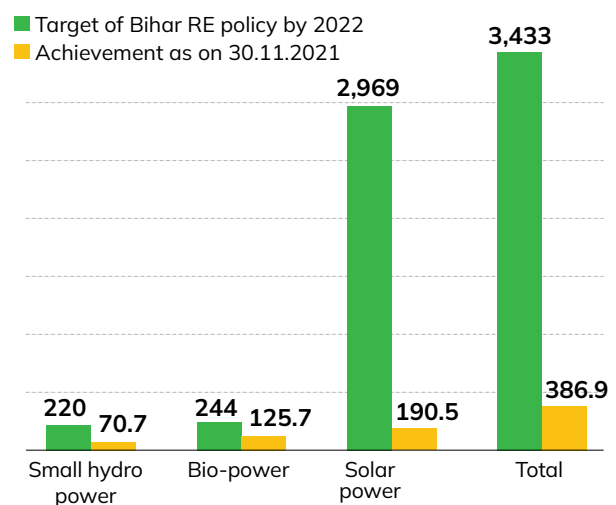
hydropower projects (MNRE, 2021). However, Bihar is far behind its target under the Renewable Energy Policy. The state has been able to achieve installation of only 386 MW of total renewable energy, which is just around 11 per cent of the target. Unlike other states, Bihar has not seen much in the way of private investments from big renewable energy players for large-scale clean energy projects and this could be the reason for the low achievement of RE targets.

Figure 9A: Bihar's installed capacity of renewable energy as on 30.11.2021, in MW

Total capacity	386.93
Small hydro power	70.70
Bio-power	125.70
BM Power/Bagasse Cogeneration	112.50
BM Cogeneration (Non-Bagasse)	12.20
Waste to energy (Off-grid)	1.00
Waste to energy	—
Solar power	190.53
Ground mounted	138.93
Roof top	30.55
Off-grid/ Distributed	21.05

Source: MNRE progress achievement data (2021)

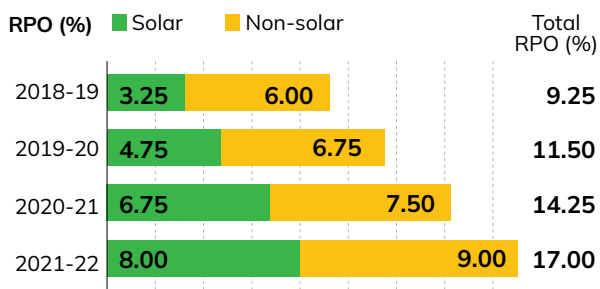
Figure 9B: Bihar's target versus installed capacity of renewable energy, in MW



Source: MNRE progress achievement data (2021)



Figure 10: Electricity to be purchased from renewable energy sources by obligated entity as a percentage of total consumption in Bihar



Source: BERC orders available at <https://berc.co.in/images/pdf/Other-Order/ord-6of19.pdf> and Mercom India report available at: <https://mercomindia.com/bihar-commission-discoms-rpo-shortfall/>

3.3.4 Status of accomplishment of renewable energy purchase obligation by Bihar

Bihar is obligated for essential purchase of renewable energy as a percentage of its total consumption under the Renewable Purchase Obligation (RPO) Regulation, 2010. Its power distribution companies (DISCOMs) have not been able to purchase the desired share of RPO in 2019-20 to 2020-21. This is due to the sudden shortfall in trading of renewable energy certificates during the pandemic. The Bihar Electricity Regulatory Commission (BERC) approved the request of the Bihar State Power Holding Company Limited (BSPHCL) to carry forward the shortfall in its RPO for 2019-20 to FY 2020-21. It further set the RPO target for financial year 2021-

22 at 17 per cent, which includes 8 per cent of solar RPO and 9 per cent of non-solar RPO.

3.3.5 Annual distribution losses

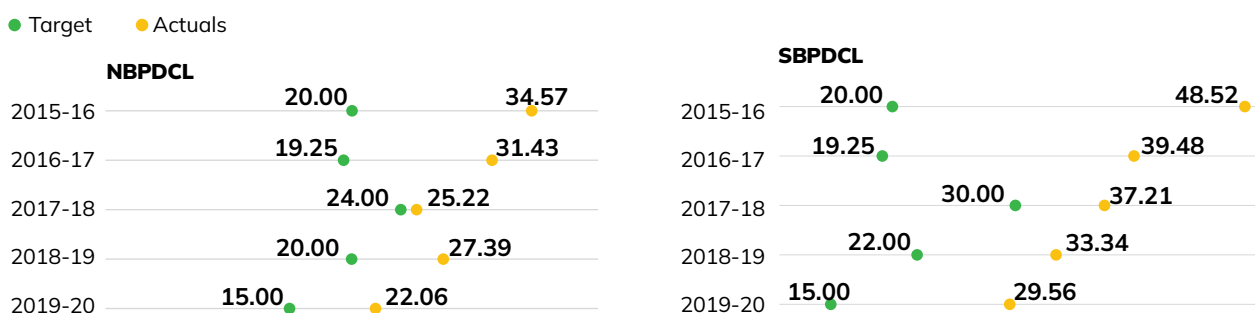
The actual distribution losses of North Bihar Power Distribution Company Limited and South Bihar Power Distribution Company Limited have reduced from 34.57% and 48.52% in 2015-16, respectively, to 22.06% and 29.56%, respectively in 2019-20. Despite this reduction in distribution losses, the DISCOMs have failed to achieve the distribution loss targets stipulated by the Bihar Electricity Regulation Commission for all the years.

Section IV: Policy and institutional landscape of climate change mitigation policies in the energy, transport and urban development sectors, and assessment of state participation in Union government schemes (Objective 4)

3.4.1 Bihar policy landscape for promotion of renewable energy

The Bihar Renewable Energy Development Agency (BREDA) is the state's nodal agency to undertake renewable energy projects and formulate policy to support the growth of clean energy. Bihar State Hydropower Corporation Private Limited (BSHPCL) is responsible for the implementation of mini/micro and large scale renewable energy projects. The state's Energy Department is the primary agency

Figure 11: Actual distribution losses of NBPDC and SBPDCL vis-a-vis target distribution losses from FY 2015-16 to 2019-20 (%)



Source: BERC, Patna, Tariff Order for FY 2021-22



Figure 12: Objectives and vision of Bihar's RE policy

Objectives and targets of Bihar RE policy



1. To set a target installed capacity of 2,969 MW solar, 244 MW biomass & bagasse cogeneration and 220 MW small hydro- power by 2022 in a sustainable manner.
2. To attract private sector participation.
3. To provide decentralised renewable energy for the agriculture, industry, commercial and household sectors, particularly in rural areas.
4. To support R&D, in the sector.
5. To promote local manufacturing.
6. To impart skills and facilitate capacity-building to establish an RE ecosystem.

Nodal agency



Bihar Renewable Energy Development Agency and Bihar State Hydro Power Corporation Limited (BSHPCL) for small/micro/mini hydro power projects

Source: Bihar Renewable Energy Policy, 2017

for decisions recognising nodal agencies / partners/ project developers for the implementation of various policies.

The policy offers several incentives for the generation of solar energy for commercial purposes, tax benefits, exemptions from electricity duty and concessions on cost of transmission system for the evacuation of renewable energy power to the nearest sub-station. It also envisages constitution of a dedicated fund to develop cohesive infrastructure for project developers. The specifics are as follows:

- All units engaged in the generation of solar and/ or renewable energy for commercial purpose will be given tax benefits for an additional 30% of the approved project cost
- For power plants of up to 15 MW, which are based on non-hazardous municipal waste and use auxiliary fuels such as coal/ lignite/ petroleum products, up to 15% is exempted
- All new micro and small units will be given tax benefits for an additional 30% of the approved project cost
- Manufacturing units shall also be offered exemption from electricity duty for five years
- The capital cost of the transmission system to evacuate renewable energy power to the nearest sub-station, including all metering and

protective instruments, shall be borne by the state government

- Projects with an individual capacity of more than 1 MW shall contribute a one-time payment as facilitation fee of Rs 1,00,000/MW, payable at the time of application, towards the Bihar State Renewable Energy Development Fund. This fund will be utilised to build cohesive infrastructure for project developers.

Several programmes of the Union Ministry of New and Renewable Energy (MNRE) are operational in Bihar. The Bihar Renewable Energy Development Agency (BREDA) is working on various schemes. One of the components of the Jal Jeevan Hariyali Mission is focussing on the universal solarisation of all government-owned setups such as hospitals, panchayat institutions, jails and schools in a phased manner. It is fully funding the installation of solar projects in government set-ups in all the districts. With another initiatives such as the Neeche Matsya Upar Bijli ('fish below and energy above'), the state government also plans to install floating solar projects, roping in the fishing community to ensure benefits for them as well while facilitating the smooth installation of clean energy projects.

3.4.2: Bihar initiatives for up-skilling youth and women for job opportunities in climate change mitigation

A few experts believe that renewable energy



technologies tend to be more labour-intensive than conventional energy technologies. At the same time, distributed renewables such as small-scale hydro, rooftop solar, and biomass create vast employment opportunities. According to a study led by think-tanks- CEEW and TERI, rooftop solar employs 24.72 persons, small hydro employs 13.84 persons, and biomass employs 16.24 persons for constructing and running a 1 MW plant.

Figure 13: Renewable energy-specific courses offered under the Bihar Skill Development Mission



Domain skilling courses

- Solar PV Surya Mitras
- National Institute of Electronics & Information Technology (NIELIT) - Solar LED Lighting Product (Design & Manufacturing)
- Solar Power Installation, Operation and Maintenance



State institution / mission

- Bihar Skill Development Mission

Source: Skill Development Mission of Bihar

Per these projections, around 4 lakhs people will get jobs in Bihar if the state meets its target of creating 3,433 MW of RE capacities. BSDM is also implementing various skilling schemes to offer domain-specific training courses that include solar technologies. The Surya Mitra Scheme and Solar LED Lighting Scheme are among courses designed to up-skill the youth for the operation, maintenance and manufacturing of solar PV and solar LED equipment. These skilling programmes are important to make the state future-ready for transitioning towards a green economy. However, it is not known whether the targets of these RE-specific skilling courses will be commensurate with the skilling requirements for clean energy transition. Per BSDM data, there are 16 training centres for the Surya Mitra Course, but the number of enrolled beneficiary trainees or candidates per centre is rather low. There is a need to set the targets for skilling in these fields.

A review of the policies and programmes of the Bihar government reveals it is paving the way for inclusive growth. It has a dedicated policy - Bihar Skill Development Policy, 2016 – and the Bihar Skill Development Mission that aim to link skill

Figure 14: Schemes for Bihar Skill Development

Department	Scheme
Bihar Skill Development Mission	<i>Kushal Yuva Programme</i> (state scheme) under Mukhya Mantri Seven Nishchayee Yuva programme
Rural Development Department through Bihar Rural Livelihood Promotion Society	<i>Deen Dayal Upadhyaya Grameen Kaushalya Yojana</i> (DDU-GKY) (Central scheme) Rural Self Employment Training Institutes (RSETIs)
SC/ST Welfare	<i>Dashrath Manjhi Kaushal Vikas Yojna</i> (DMKVY)
Science & Technology	Skill development scheme
Social Welfare (Social Welfare Directorate)	<i>Mukhyamantri Nari Shakti Yojana</i> (MNSY)- Service Sector Training
Social Welfare (Women Development Corporation)	<i>Mukhyamantri Nari Shakti Yojana</i> (MNSY)- Service Sector Training
Social Welfare (State Society for Ultra Poor and Social Welfare-SAKSHAM)	<i>Mukhyamantri Bichhabritt Nivaran Yojna</i>
Village and Small Industry Division under Industry	Skill development programme
Industry (Directorate of Technical development)	Skill development short-term training programme
Industry (Directorate of Technical development)	Employment-oriented training programme

Source: Bihar Skill Development Mission Programmes and Initiatives



development with improved employability and productivity. The Mukhya Mantri Seven Nishchayee Yuva programme and its key scheme, the Kushal Yuva Programme, provide an objective framework to carry out skill development in the state. There are many skilling schemes being implemented by various departments of the Bihar government, mandated for the welfare of vulnerable segments of the population, such as the those focussed on women, farmers, SC/ST, rural youth, etc. Some of the schemes run by these departments are mentioned below. These schemes are enabling inclusiveness in the state government's skilling programme. Currently, there is a lack of disaggregated information on how these programmes are integrating skilling with job opportunities in the climate change mitigation sector. Also, there is a need to create an interface between the existing skilling programmes from various departments and the up-skilling requirements for job opportunities in the climate change mitigation sector.

3.4.3 Bihar policy landscape for promotion of low carbon development of transport sector, and its financing

Bihar's draft Electric Vehicle Policy, 2019 aimed at the creation of a manufacturing ecosystem for e-vehicles in the state, accomplishing SDG targets in this field, and making Bihar the preferred destination for investments. Its mission, as mentioned in the draft policy, is to support the Centre in its proposal to bring 100 per cent e-mobility by 2030, ending manual paddling in the state, setting up fast-charging stations every 50 km on state highways, attracting on-ground investment of Rs 2,500 crore, and creating empowerment opportunities for 10,000 persons in the state. Under the policy, priority is being given to remove paddle-rickshaws and upgrade to 100 per cent electric mobility by 2022. Bihar State Road Transport Corporation (BSRTC) and Transport Department are the agencies for the implementation of the EV policy.

Other initiatives taken by the Bihar government

include the augmentation of its bus fleet, participating in the Central scheme for electric vehicles (FAME-II) and a clean fuel scheme for the promotion of CNG-based three-wheelers. Bihar State Road Transport Corporation Limited (BSRTC) is the nodal agency for the purchase of buses and implementation of other clean fuel-related initiatives. The state government is providing grant-in-aid and subsidies to BSRTC (Rs 80 crore in Budget Estimates 2020-21). It is also taking steps to phase out diesel-run busses from the capital city (Faryal Rumi, The Times of India, 2021). This is an important intervention for a modal shift towards a clean fuel-based (CNG-based) public transport system in Bihar. However, investments in a CNG-based bus transport system present the risk of carbon lock-in in the long term and may not be sufficient for a reduction in GHG emissions for the carbon neutrality trajectory and for greening the economic recovery (Renewable and Sustainable Energy Reviews, 2021).

The Bihar government has also started participating in the Central scheme of Faster Adoption and Manufacturing of Hybrid and Electric Vehicles Phase -II (FAME-II), which provides demand-based incentives to all states (including Bihar) for augmenting transport systems with electric-based fleets. Bihar seems to be focussed on adding vehicles at the low-end segments. Of the 5,725 e-vehicles it has added using incentives under FAME-II (National Automotive Board, 2021), 5,250 are electric two-wheelers and e-rickshaws.

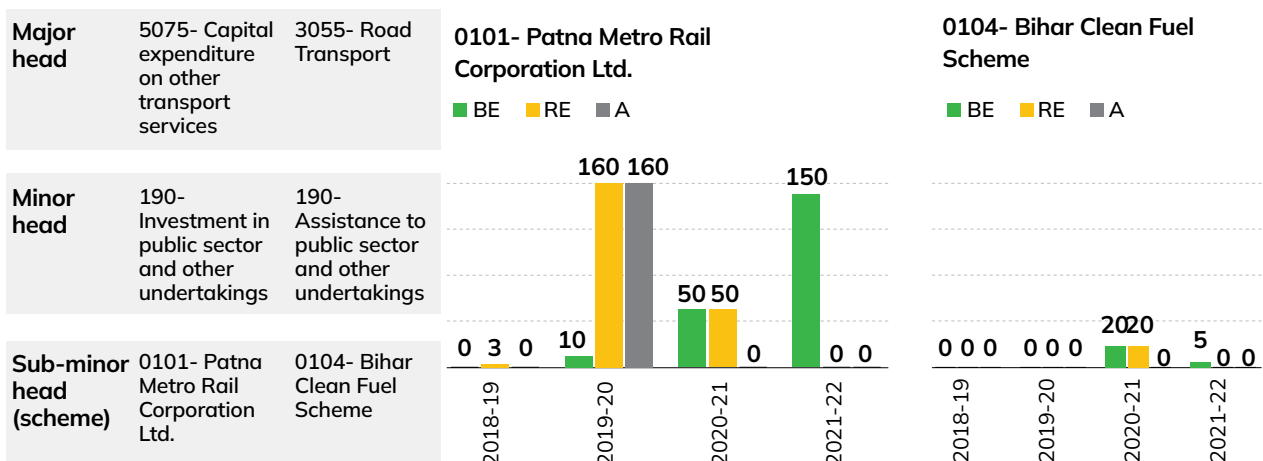
The state government also launched the Clean Fuel Scheme in 2019 to encourage three-wheeler owners to retrofit petrol/diesel-based vehicles with CNG or battery-operated kits (Transport Department, Bihar Government, 2019). The Bihar Clean Fuel Scheme's objective is to encourage the operation of clean fuel-powered vehicles (CNG and battery-powered vehicles) with the aim of establishing alternative and low-carbon transport arrangements with an expected improvement in the ambient air quality. The budget estimate for the scheme is Rs 5 crore in 2020-21. Apart from giving a thrust to augment



Figure 15: Various interventions of Bihar government for low-carbon development of the transport sector and their financing

Objectives and targets	Incentive provisions under the policy	Implementing agencies
<p>The mission of the state policy is to support the Centre in its proposal to bring in 100 per cent e-mobility by 2030, end manual paddling in the state, set up fast-charging stations every 50 km on state highways, attract on-ground investments of Rs 2,500 crore and create empowerment opportunities for 10,000 persons. Priority is given to the removal of paddle rickshaws and upgradation to 100 per cent electric mobility by 2022. Bihar State Road Transport Corporation (BSRTC) and Transport Department are the implementing agencies for the EV policy.</p>	<ol style="list-style-type: none"> The first 10,000 EVs in different segments to get end-user subsidy of 15 per cent on the base price with caps in each segment Special incentive of Rs 10,000 shall be given to electric rickshaws on using lithium-ion battery as a replacement for lead acid battery Exemption from road tax and registration fees for electric vehicles Top-up subsidy of Rs 8,000 if the end-user is below the poverty line or belongs to the SC/ST community The first 250 commercial public EV charging stations will be eligible for 25 per cent capital subsidy on equipment/machinery (limited at Rs 10 lakh per station) Other incentives offered under Industrial Investment Promotion Policy, 2016 	<p>Bihar State Road Transport Corporation (BSRTC) and Transport Department</p>
<p>National Mission for Enhanced Electric Mobility Mission Vision</p> <p>The objective is to encourage the operation of clean fuel-powered vehicles (CNG and battery-powered vehicles) with the aim of alternative and low-carbon transport arrangements and expected improvement in ambient air quality.</p>	<p>Demand-based incentives offered by the Centre</p> <p>An incentive is offered if the owner replaces old diesel-powered three-wheelers with CNG- or battery-powered vehicles. Also, the owners of petrol-powered three-wheelers for replacement of new CNG driven or battery driven three wheelers or for the retro fitment of CNG kits in petrol driven three wheelers, maxi cabs and motor cabs will be paid incentive.</p>	<p>Bihar State Road Transport Corporation (BSRTC)</p> <p>Municipal corporations and Road Transport Department</p>

Figure 16: Budget allocations for a few low-carbon modes of transport (Rs crore)



Source: Detailed Demand for Grants for Various Years, Road Transport Department in Bihar



its electric vehicle fleet, the Bihar government has invested in public transport systems such as Metro Rail in the capital city, Patna. The allocation for the clean fuel scheme and Patna Metro Rail Corporation Limited was Rs 5 crore and Rs 150 crore, respectively, in the Budget Estimates for 2020-21.

3.4.4: Various interventions of Bihar government for clean energy initiatives in agriculture sector – solar agricultural pumps

In the agriculture sector, Bihar launched the Saur Kranti Sinchai Yojana in 2012 as a solution for the lack of adequate electricity for irrigation. It is aimed at increasing the irrigated area by providing highly subsidised (90 per cent capital subsidy) small solar pumps (2 kWp) to farmers with 1-5 acres of land, a functional bore well and a willingness to contribute 10 per cent of the capital cost: R .28,000, for alternating current (AC) pumps and Rs 29,700 for direct current (DC) pumps. Another important initiative from Bihar is the policy for the Promotion of New and Renewable Energy, 2017. It targets the deployment of 10,000 solar pumps by 2022. A report found that under the Saur Kranti Sinchai Yojana, solar pumps were not powerful enough (2 kWp) to irrigate all the lands of farmers operating with non-contiguous landholdings. It was also found that there was not enough water in the shallow aquifer for the pumps to be operable throughout the winter and summer seasons. Besides these ground challenges, the delay in the launch of the solar irrigation pump scheme, which the Centre announced in 2019-20, left the Bihar government with no option but to increase the diesel subsidy for farmers. The Bihar government provides a subsidy of Rs 50 a litre and a farmer with an acre of land gets subsidy for 10 litres of diesel for each round of irrigation. According to a news report, as many as 22.93 lakh farmers applied for diesel subsidy during the 2019 rabi season, while the number of applications received during the kharif season was 19.38 lakh. Out of these, around 15.64 lakh farmers got diesel subsidy worth Rs 195 crore in the kharif season alone (TV Jayan et.al. The Hindu, 2019).

Figure 17: Objectives, targets and incentives offered under Solar Pump Scheme



Climate change mitigation related policy/ state scheme

Scheme related to decentralised renewable energy applications, such as agricultural solar pumps for irrigation - *Bihar Saur Kranti Sinchai Yojana* (Solar Energy Irrigation Scheme)



Objectives and targets

Bihar Renewable Energy Policy targets deployment of 10,000 solar pumps by 2022. Bihar has a dedicated scheme to meet this target – Bihar Saur Kranti Sinchai Yojana. Under this scheme, farmers will get solar pumps for irrigation purposes.



Nodal agency

Bihar Renewable Energy Development Agency and Agriculture Department



Incentive provisions under the policy

Under the scheme, 90 per cent subsidy grant is offered to the farmers by the government and the remaining 10 per cent will be deposited by the farmers. Farmers with land holdings of 1-5 acres will be eligible for this scheme. Also, farmers who have a bore of 4 inches or more will be selected.

3.4.5: Bihar Policy landscape for promotion of low-carbon development of urban sector

The Centre launched the Climate Smart Cities Assessment Framework, 2019 to provide a clear roadmap to combat climate change through mitigation and adaptation measures in urban development (MoH & UA, 2021). This framework will be part of the National Mission of Sustainable Habitat (NMSH). And, this will be implemented through three programmes: Atal Mission on Rejuvenation and Urban Transformation (AMRUT), Swachh Bharat Mission, and Smart Cities Mission. Along with these programmes, the implementation of the Energy Conservation and Buildings Codes (ECBC) is mandated under the National Mission of Sustainable Habitat. In this context, this section provides a summary of Bihar's initiatives for urban development and its efforts for low-carbon development of the urban sector.



In the urban development sector, Bihar has adopted schemes from the Central government — Smart City Mission, Housing for All Mission and AMRUT Mission — and a state scheme for multi-storey housing for the urban poor under CM's Saat Nischay-2. Bihar is also rolling out schemes for integrated development of small and medium towns and for the development of its capital city. However, there are no specific guidelines for a strategy relevant to climate change mitigation under these schemes. The schemes are financed through SMART City Mission and other Central missions for urban development. There is a gap in the adoption of low-carbon strategies among some city-level government agencies; mainstreaming low-carbon development in city-level planning and inclusion in budgetary outlays is still an uphill effort. Bihar is also set to become the country's first state to have two green energy efficient towns, in Rajgir and Bodh Gaya, which will be supplied with renewable energy by 2023 (Ruchir Kumar, The Hindustan Times, 2020). This pilot holds significant potential to dovetail the objectives of developing climate-resilient and low-carbon cities and towns with low-carbon urban infrastructure.,

As a green measure, the Bihar government is committed to use 100 per cent fly ash-based bricks for construction. However, buyers need to be increased (outside Bihar) for fly ash bricks. This is possible if quality standards and quality assurance processes are followed in the manufacture of bricks, attractive financial incentives are provided, and a marketing strategy is brought in by the Bihar government (Development Alternatives, 2019).

The Applicable Energy Conservation Act, 2001 is an important strategy for low-carbon development of urban infrastructure. The Adoption of Energy Conservation and Building Code under the EC Act, 2001, as notified by the Bureau of Energy Efficiency (BEE), Ministry of Power in 2017 and amended in 2020, for new commercial building construction in India, targets a 50% reduction in energy use by 2030 in the country. This would translate into energy

Figure 18: Landscape of Public Policy for Low Carbon Development of the Urban Sector



Climate change mitigation related policy/ state scheme

Low carbon development of urban infrastructure, implementation of important acts such as the Energy Conservation Act, 2001

Schemes such as Smart city, AMRUT, *Swachh Bharat*



Nodal agency

Urban Development Department, BREDA for EE measures in association with Municipal authority, Bihar Urban Infrastructure Development Corporation Ltd (BUIDCO) for Energy efficient public street lighting, sewerage infrastructure



Incentive provisions under the policy

Incentives are designed-based EE schemes from BEE, Ministry of Power

Source: CBGA compilation from review of several climate mitigation policies

savings of about 300 billion units and peak demand reduction of over 15 GW in a year. This will be equivalent to expenditure savings of Rs 35,000 crore and 250 million tonnes of CO₂ emission reduction for the country. As on March 31, 2020, the BEE had processed approvals for the implementation of ECBC in Bihar (BEE, 2020). BREDA will be the nodal agency for the implementation of energy conservation building codes in Bihar. The adoption of ECBC codes by Bihar will offer an opportunity for the low-carbon development of urban infrastructure through energy conservation. This could be an enabling strategy for greening the economic recovery of Bihar.

The table below depicts the schemes from the Urban Development Department, which can be improved upon for inclusion of climate actions. (For a detailed breakdown on the distribution of funds, kindly refer to Annexure 2)



Section IV

Key observations and inputs for policy measures

While Bihar has laid down strategies to make various sectors of the economy responsive to the needs of climate change mitigation, most of the existing strategies are executed in a sporadic manner without a long-term vision for a green economic recovery. To instigate a framework for a green economic recovery and leverage climate financing, each sectoral policy needs to mainstream concerns about climate change, environmental sustainability and inclusivity. While doing so, the Government can consider the following action points;

- Pilot projects being implemented in Bihar for clean energy usage in towns and cities are a step in the right direction. These pilot projects by the Bihar Government hold significant potential to dovetail the objectives of developing climate resilient and low-carbon cities and towns with low-carbon urban infrastructure. However, Bihar should roll out a dedicated strategy for holistic planning instead of moving in a sporadic manner on this objective.
- Bihar has been able to achieve installation of only 386 MW of renewable energy, which is only around 11 per cent of the stipulated target by 2022. Unlike other states, Bihar has not seen much private investment from big renewable energy players for large-scale clean energy projects. This could be the reason for low achievement of RE targets as on date. Expert believe that the non – availability of land, high transmission and distribution losses to the tune of 22 per cent and 29 per cent, respectively, with two State DISCOMS, NBPDC and SBPDCL, respectively, are other reasons for the lack of interest from RE investors.
- There is a need to include unskilled women and local communities in skilling for the supply chain side of distributed off-grid RE Technologies. Designing a skilling programme for interstate replenishment of the requirement of the workforce in the RE industry and ensuring quality standards while skilling for climate change mitigation should be a priority for the government. Specialised Up-killing courses for jobs in industries related to climate mitigation technologies should be encouraged and can be launched through Rural Self Employment Training Institutes (RSETIs).
- There is a need to make climate change mitigation concerns an integral part of Urban Development programmes and schemes as it brings in local co-benefits by reducing air pollution, improving the longevity of created capital assets
- There is a need for continued investment by the Bihar government in a CNG based bus transport system. However, it presents a risk of carbon lock- in investment in long term and may not be sufficient for reduction in GHG emissions for carbon neutrality trajectory and greening the economic recovery. In futuristic scenario, Bihar government can design and invest in interventions for building cohesive environment for electric mobility.
- There is a need to design climate change mitigation schemes and programmes for the benefit of the poor such as broadening the scope



of solar pump schemes to small landholding farmers as eligible beneficiaries, reducing the upfront cost of two-wheelers/ e- rickshaws for the low-income population etc.

- There is need to reduce the public finance outlays for environmentally harmful practices such as diesel subsidy and substitute these with investments in clean technologies like solar based irrigation pumps.
- There is a need for inclusion of local un-skilled workers such as women, rural youths, and the SC-ST population in skilling for installation and after sales services like operation and maintenance of Renewable Energy-based equipment. A customized programme can be designed involving unskilled labour in supply chain mechanisms such as after-sales service coordination, instructing consumers on plug-in steps, information on offered subsidies benefits, as household distributors for off-grid and distributive RE equipment and technologies etc. This will improve economies of scale and the local market for clean energy technologies.

Instead of reinventing the skilling policy, some of the existing schemes being operated by the social welfare department, like *Mukhyamantri Nari Shakti Yojana (MNSY)*, *Dashrath Manjhi Kaushal Vikas Yojna (DMKVY)* etc. for service sector training of women, the SC-ST population and other vulnerable groups of society can include such training. Another measure that Bihar can take is improving training course quality standards to international levels so that candidates skilled in Bihar can easily be absorbed in other states with high potential for harnessing RE .

- Training needs can be based on local resources and requirements. For example, Bihar has the highest demand for e-Rickshaws, and so training programmes can be devised for manufacturing, operation, and maintenance services in this segment. Being an agriculture-based economy, the state also has rich biomass potential for energy production. Training programmes on maintenance of biomass-based energy technologies should also be included in the Bihar Skill Development Programme.





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Annexure 1

A Methodological Guidance Note on Assessing the Climate Responsiveness of Bihar States' Power Sector Financing

1. Scope of Methodology

The onus of implementing the national ambition for a clean energy transition largely lies with state governments and their climate policy. Financing of states' climate policy is demonstrated through their budgets' responsiveness. Thermal Power Generation is the biggest contributor to GHG emissions among all the sectors in India and a similar situation exists at the state level. Broadly, budget expenditure can have a positive impact on the climate if it represents measures for the mitigation or a negative role if it directly or indirectly supports the use of fossil fuel based power generation. However, assessing the climate responsiveness of budgets requires a methodological process as it is not always easy to determine this and for policymakers to have conclusive insights. It therefore seems necessary to develop this methodological guidance note, which offers a framework to assess the responsiveness of States' power sector budget in financing of climate change mitigation (reducing GHG emissions) interventions. The objective is to improve the responsiveness of the budget towards climate mitigation by ensuring that actions and investments progressively eliminate expenditure with a negative impact on the climate, wherever possible, and increase expenditure that supports a clean energy transition. This will assist in designing well-thought-out proposals for a greening of the economic recovery of states by identifying climate relevant expenditure for investors, meeting demands for transparency in climate financing and promoting information on cross-sectional issues.

The ultimate outcome of applying this methodological guidance is to provide a better understanding of the coherence of states' public expenditure in reaching climate mitigation targets with respect to the power sector. This will provide inputs, to frame a progressive public climate finance policy that enables a Green Economic Recovery following the shock of the pandemic.

2. Steps involved in Assessing Climate Responsiveness of State Budgets

Several steps are involved in assessing the climate responsiveness of budgets. The three major steps are:

- 1) Identification of scope of expenditure** in terms of identifying the department (s) mandated with functions of Power sector development. At the scoping stage, it sets out the expenditure items (pertaining to nodal Departments) that are to be included and those that are out of scope. The Receipt budget expenditure is kept in the scope of analysis.
- 2) Identification of Budget lines that is, neutral or "with climate impact"** in terms of identifying the budget lines which 'with climate responsiveness' and expenditure items that are described as 'neutral'. Then, the expenditure items 'with climate impact' are to be analysed in depth, most often by



analysing supplementary information in addition to budgetary or financial data. There are five tiers of information in Budget accounts: Major heads, Sub-major heads, Minor Heads, Detailed Heads, and Object Heads. Identification of the budget lines into three categories is carried out by unifying the information lying in these five tiers of information (by concatenating them). The criteria to identify budget lines with neutral or “with climate impact” are as follows:

Neutral: This expenditure does not have a significant impact on emissions or on capturing greenhouse gases. It therefore does not actively contribute to climate change, nor does it help reduce GHG emissions. Examples: social benefits to employees, salaries, and administration travel, recoveries and food allowances.

With climate responsiveness: This expenditure is compatible with a national ambition for climate change mitigation particularly for Renewable Energy. It provides a significant reduction in emissions compared to existing alternatives. For example, Addition of Renewable Energy, Transmission and distribution network, Electrification using off-grid technologies etc.

3) Analysis on Priorities of expenditure “with

climate impact”: The aim of this third stage of analysis is to identify the climate responsiveness of all expenditure included in the budget of the Power Departments of State Governments. It consists of a line by line analysis of the budget on a rationale-based categorisation of actions. Actions are then rated as highly favourable, quite favourable, unfavourable or undefined for the climate. The results provide a better understanding of the coherence of the expenditure towards making progressive budget decisions for a green economic recovery. Expenditure items are classified into three categories according to their impact on the climate:

Highly Favourable: This expenditure is coherent with the national ambition for climate change mitigation. Expenditure on this activity provides a significant reduction in emissions compared to existing alternatives. For example: Installation of Renewable Energy Capacities

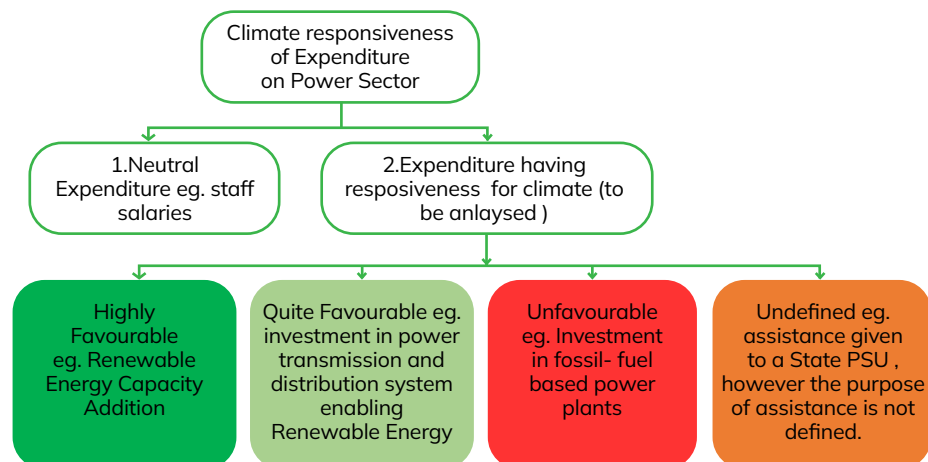
Quite Favourable: This expenditure reduces emissions in the short term, but the reduction is insufficient to put the area on the path to low-carbon development. This category notably includes equipment and infrastructure that present a risk of carbon lock-in the long term. For example: a transmission and distribution network

Figure 2: Depiction of 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)





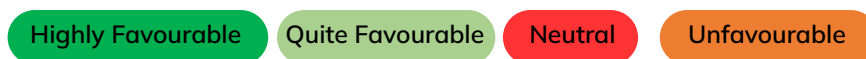
Unfavourable: This expenditure is non-coherent with the Indian commitment for climate change because it makes a significant contribution to greenhouse gas emissions. For example, Subsidies for diesel based pumps or fossil fuel based power generation

Undefined: This expenditure cannot be categorised in the above three ratings, as these require extra-budgetary supplementary information and need to be discussed with the State Government.

3. Rationale used for Categorisation of expenditure for Climate Change Mitigation

We unified the five tiers of budget information to rate the responsiveness of budget expenditure on climate change mitigation, particularly for a clean energy transition. Broadly, the rationale used for categorisation of budget expenditure of states is as follows;

Categories of Budget Responsiveness



Nature of Budget Expenditure	Rationale for Categorisation
New and Renewable Energy Related Expenditure (major Head 2810)	● This expenditure, under major Head 2810, supports a transition to low-carbon development (LCD) of the power sector with promotion of renewable energy.
Expenditure related to Hydroelectric Power Generation	● Budget lines related to “hydropower generation” are categorised as highly favourable as the government, under the New Hydroelectricity Policy, has approved ‘renewable energy status’ for large hydel projects. Earlier, only smaller projects of less than 25 Megawatt (MW) in capacity were categorised as renewable energy. In addition, large-scale hydro projects are considered as a separate source of energy.
Expenditure related to Energy Efficiency Initiatives	● Improving energy efficiency is the key tool in reducing GHG emissions besides addition of Renewable Energy and Energy Conservation. for example, Scheme for Domestic Energy efficient -LED lighting“Amma Ghar LED lighting”
Expenditure related to Transmission and distribution networks	● Expenditure on Transmission and Distribution infrastructure supports the integration of renewable energy into the power grid. It supports parallel development of low carbon power generation capacity using renewables along with a transition away from fossil fuel-based energy e.g.. Investments in SMART grids.
Expenditure related to intra-state (within the state) distribution networks	● Expenditure on Intra state Distribution infrastructure supports the integration of renewable energy by improving the robustness of the power system with a reduction in Average Transmission, Distribution & Commercial (AT&D) losses shown by the power utilities in states and indirectly supports state in promotion of net-metered based off-grid RE technologies installation.

Continue next page...



Categories of Budget Responsiveness

Highly Favourable

Quite Favourable

Neutral

Unfavourable

Nature of Budget Expenditure	Rationale for Categorisation
Expenditure with respect to Rural Electrification Programmes by States	<p>● Most of the expenditure with respect to Rural electrification falls under Central Sponsored Schemes such as SAUBHAGYA-Pradhan Mantri Sahaj Bijli Har Ghar Yojana, Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY) or the State's own initiatives for rural electrification. The scope of work of the DDUGJY and most of the rural electrification programmes includes agriculture feeder separation, laying down low-tension electric lines, as well as strengthening and augmentation of sub-transmission and distribution network in rural areas for electrification. This is leading to parallel development of low-carbon power generation capacity using renewables in the end.</p>
Expenditure related to salaries, pay allowances and secretariat-related work	<p>● This expenditure does not have a significant impact on emissions. It therefore does not actively contribute to climate change, nor does it help reduce GHG emissions. Expenditure is for administrative or secretariat purpose, salaries, allowances etc. However, expenditure related to salaries of employees specified under the Renewable Energy Department is categorised under the Highly Favourable Category.</p>
Expenditure related to thermal Power Generation (largely fossil-fuel based)	<p>● This expenditure is non-coherent with the Indian commitment for climate change mitigation and a clean energy transition because it is an enabled activity that makes a significant contribution to greenhouse gas emissions through thermal power generation. There could be an argument that Thermal power generation equipped with Ultra Mega Power Plant (UMPP) technologies could be considered under the Quite Favourable Category. However, with respect to this version of the Methodology, we have kept such expenditure in the Unfavourable Category and it is subject to future refinement in the methodology.</p>
Expenditure on Free Power (Largely Fossil Fuel based) Supply to Farmers	<p>● This expenditure is causing a huge burden on the state government and at the same time derailing the transition towards clean energy adoption and thus, is categorised as unfavourable. There is a need for states to develop a roadmap on phasing down free subsidies of fossil fuel-based power supply as it reduces market scalability of off-grid RE technologies and locks in state expenditure on technologies. This is also unfavourable in reducing GHG emission. It is also inconsistent with the goal of promoting solar based agriculture pumps / other off-grid RE technological solutions. Few governments have recognized the burden of free power subsidies and started planning for solar-based free electricity supply subsidies to farmers. However, since such initiatives of the government are still in planning stage, so this version of methodology is categorizing this expenditure into unfavourable category and subject to future refinements.</p>
Expenditure is meant for providing Grant-in-aid Assistance in Public sector and other undertakings such as the State Power holding company etc.	<p>● This expenditure is categorised as undefined as it requires supplementary information from the power department to confirm whether there was any spending of grants-in-aid on the State PSU for promotion of Renewable Energy.</p>



4. Application of the above Methodology Steps in Select Project State(s) – Bihar

We had followed the above described rationale for categorisation of budget line expenditure to assess the climate responsiveness of the power sector. We found through a summation of category wise expenditure that expenditure towards promotion of renewable energy is quite miniscule in the overall power sector budget of the Bihar government and

hence the state needs to set forth its priorities on this front. Table 1 and 2 provide category-wise budget expenditure (sub-total) for climate change mitigation by the power department of the Government of Bihar. The largest share in the budget expenditure is categorised as an “undefined” category. This is due to the non-availability of supplementary information with the power department to confirm whether there was any spending from grants-in-aid on the State PSU for promotion of Renewable Energy.

Figure 4A and 4B: Bihar power sector budget expenditure responsiveness towards climate change mitigation

Figure 4A: Amount under various categories (Rs crore)

	Highly Favourable	Quite Favourable	Neutral	Unfavourable	Undefined	Total
2017-18 A	0.0	6,402.6	-64.8	1,292.5	3,832.5	11,462.8
2018-19 A	28.6	6,123.8	2.9	0.0	5,962.5	12,117.8
2019-20 A	46.6	3,107.2	-6.3	0.0	5,950.2	9,097.7
2020-21 RE	54.5	1,075.9	4.5	0.0	7,517.6	8,652.5
2021-22 BE	79.5	1,719.1	3.8	0.0	6,757.6	8,560.0

Source: Methodological Guidance Note

Note: Bifurcation of the negative value in some of the above categories like neutral can be seen in the annexure. The General Framework for Categorization of Expenditure for climate change mitigation responsiveness can be seen in Annexure 1 and the Excel file on the application of the methodology for categorisation of budget expenditure is available on the CBGA website

Figure 4B: Various categories' share in total expenditure (%)

	Highly Favourable	Quite Favourable	Neutral	Unfavourable	Undefined	Total
2017-18 A	0.0	55.9	-0.6	11.3	33.4	100.0
2018-19 A	0.2	50.5	0.0	0.0	49.2	100.0
2019-20 A	0.5	34.2	-0.1	0.0	65.4	100.0
2020-21 RE	0.6	12.4	0.1	0.0	86.9	100.0
2021-22 BE	0.9	20.1	0.0	0.0	78.9	100.0

Source: CBGA-derived methodology

Note: The General Framework for Categorization of Expenditure for climate change mitigation responsiveness can be seen in Annexure 1. The Excel file on the application of the methodology for the categorisation of budget expenditure is available on the CBGA website. Please refer to the EXCEL file for (-) values



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

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Designed by: How India Lives (www.howindialives.com)

Published by Centre for Budget and Governance Accountability

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

The project- Building Knowledge and Capacity for Green Economic Recovery of the States in India 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.



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