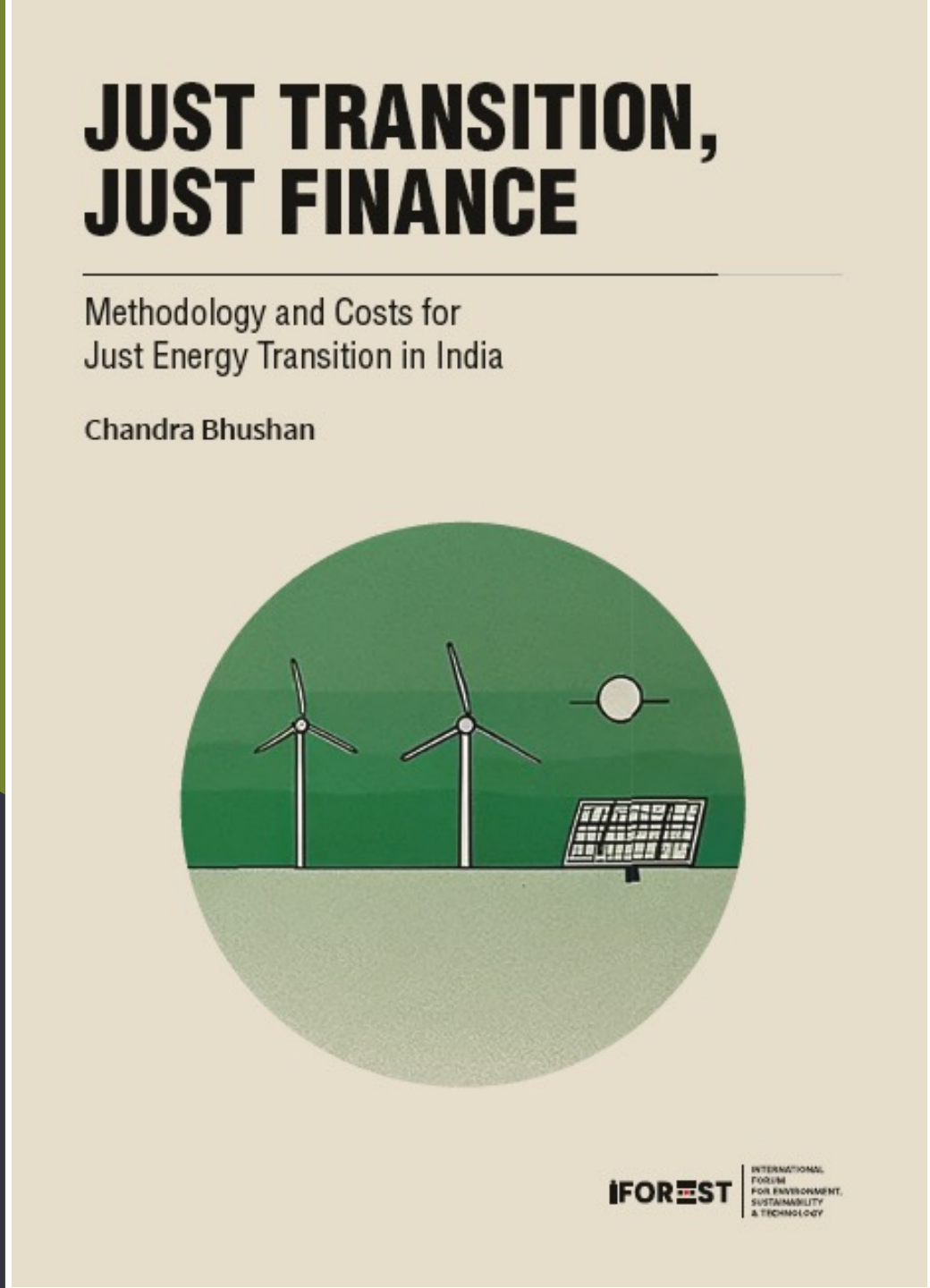


Report Launch & Webinar

9 January, 2024

iFOREST
INTERNATIONAL FORUM FOR ENVIRONMENT, SUSTAINABILITY & TECHNOLOGY

Just Transition Context of India's Coal-Dependent Districts

India's Realities

1. Mono-industry districts

District	Share of mining in district's GDP (%)	Share of mining + manufacturing in district's GDP (%)
Dhanbad	38	51
Ramgarh	21	40
Hazaribagh	25	42
Bokaro	20	50
Korba	50	61
Angul	20	53
Jharsuguda	36	49
Singrauli	41	47
Shahdol	31	42

Source: District economic surveys

* *Year not same for all districts*

India's Realities

2. Informal economy and workforce – *informal workforce at least 4-times the formal*

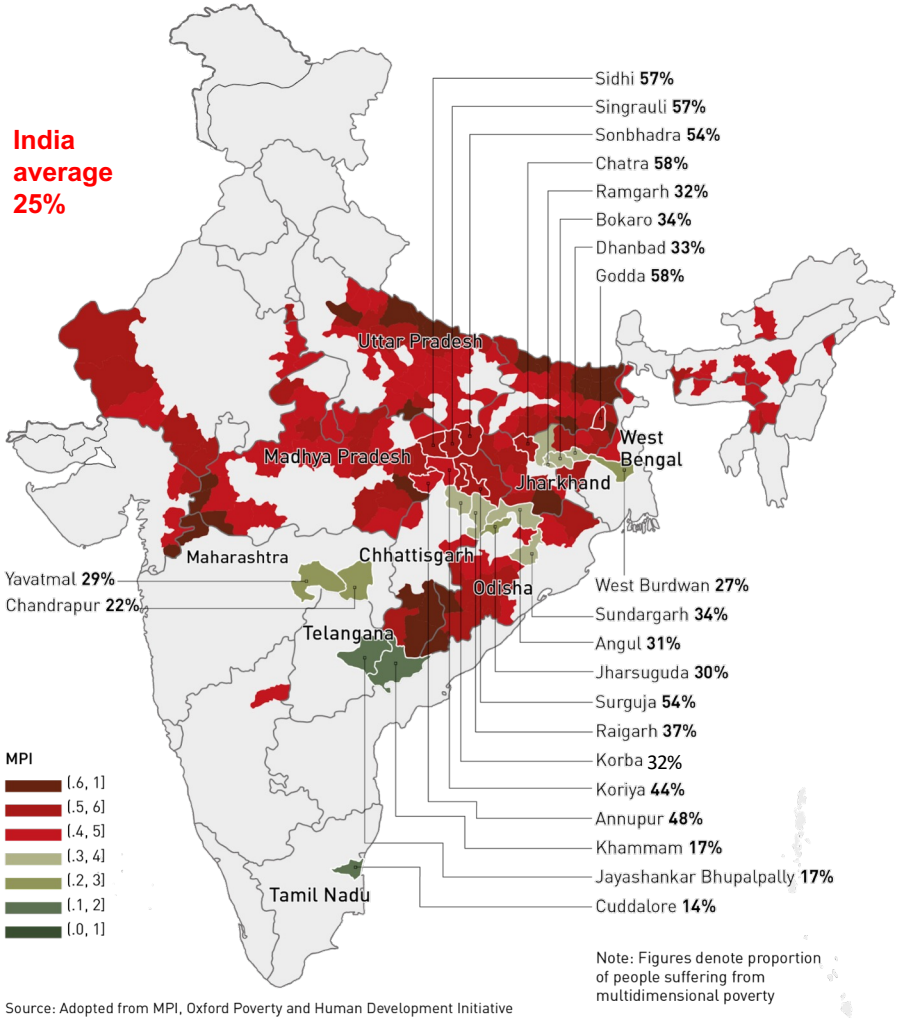
Sectors	Informal Employment	Formal Employment	Total Employment
Coal mining	1.8	0.8	2.6
Coal-based power	0.05	0.13	0.18
Iron and Steel	2.6	0.3	2.9
Cement	1.2	0.2	1.4
Oil and Gas (barring refineries)	NA	0.12	0.12
Refineries	0.08	0.04	0.12
Fuel Retail	0.96	0.14	1.10
LPG distribution	0.01	0.09	0.10
Fertiliser	0.2	0.02	0.22
Automobile	NA	NA	12.8
Total	**6.9**	**1.8**	**21.5**

Source: iFOREST

India's Realities

3. Coal districts have low HDI and are economically backward

- 50% population is multidimensionally poor in many coal districts (twice India's average of 25%).
- Suffer from poor health, education and living standards.
- Most are also "critically polluted".



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India’s Realities

4. Unprofitable mines – *Two-thirds mines are loss-making.*

- 75% of CIL’s production and almost all profits come from just **35 large mines**.
- Loss-making mines collectively produce **10%** coal, employ **40-45%** workforce, and incurred a loss of **Rs. 16,000 crores in 2018-19 – same as net profit.**
- CIL plans to reach 1 billion tonnes production from **"50-odd high yielding mining projects"** and close unprofitable mines (80-odd mines by 2030).
- Unplanned closure has major negative implications on environment, land degradation, local economy and social stability. **A Just Transition is a ‘Win-Win’.**

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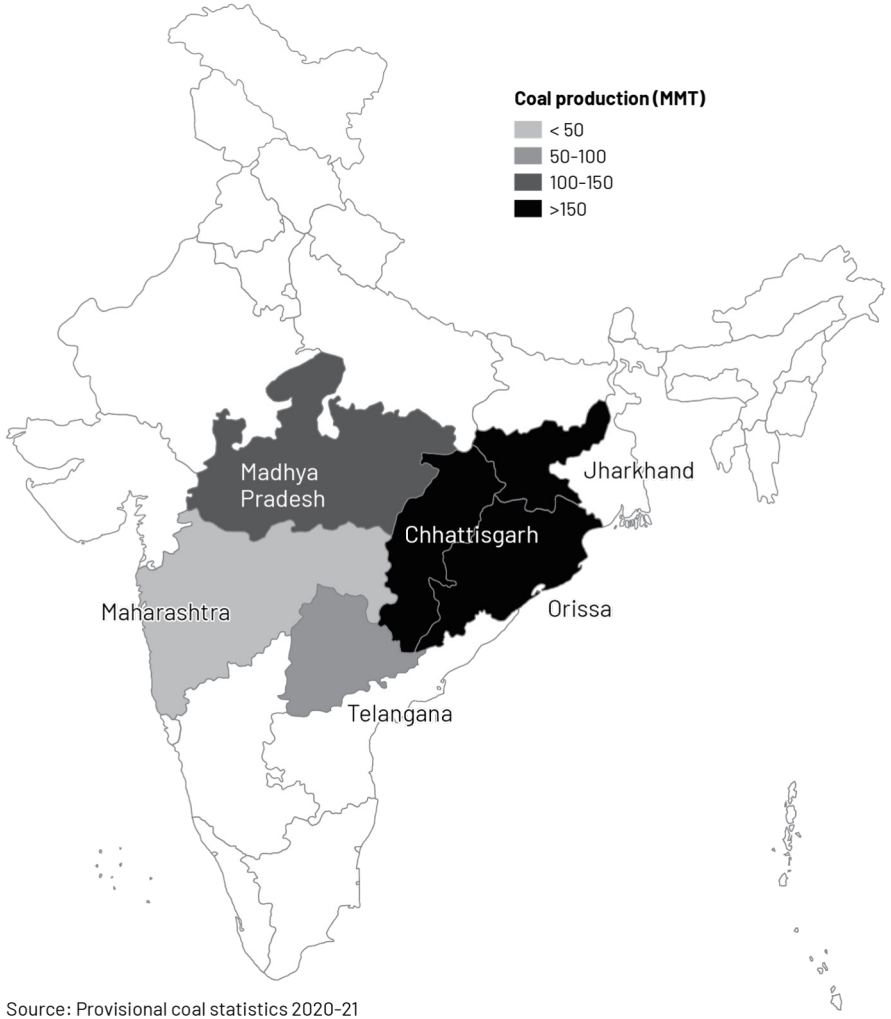
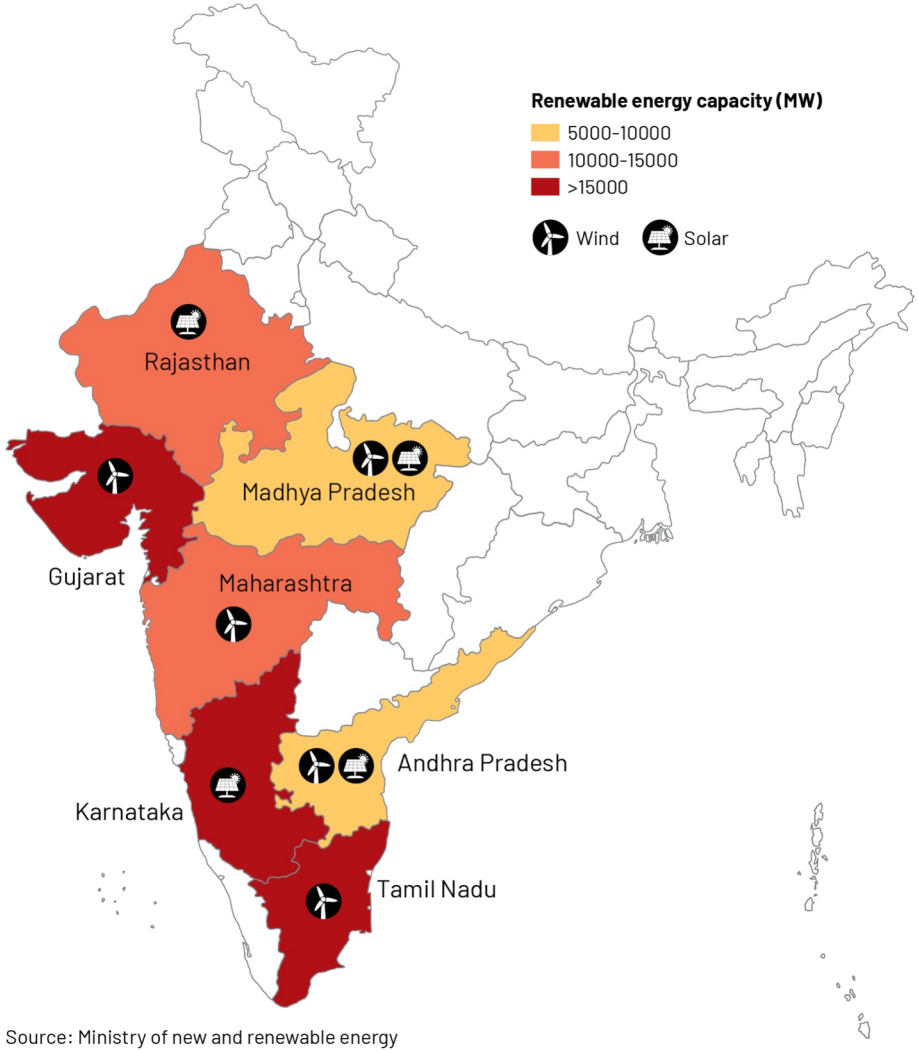
India’s Realities

5. The New Energy Geography of India



Source: Provisional coal statistics 2020-21



Source: Ministry of new and renewable energy

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न्यायसंगत परिवर्तन

ન્યાયમૈન પરિવર્તન

ન્યાય્ય સંક્રમણ

நியாயமான மாற்றம்

Just Transition

ನ್ಯಾಯ್ಯ ಪರಿವರ್ತನ

منصفانہ منتقلی

ন্যায্য হস্তান্তর

ન્યાય્ય પરિવર્તન

ನ್ಯಾಯವಾದ ಪರಿವರ್ತನೆ

What will it entail, and how much will it cost?

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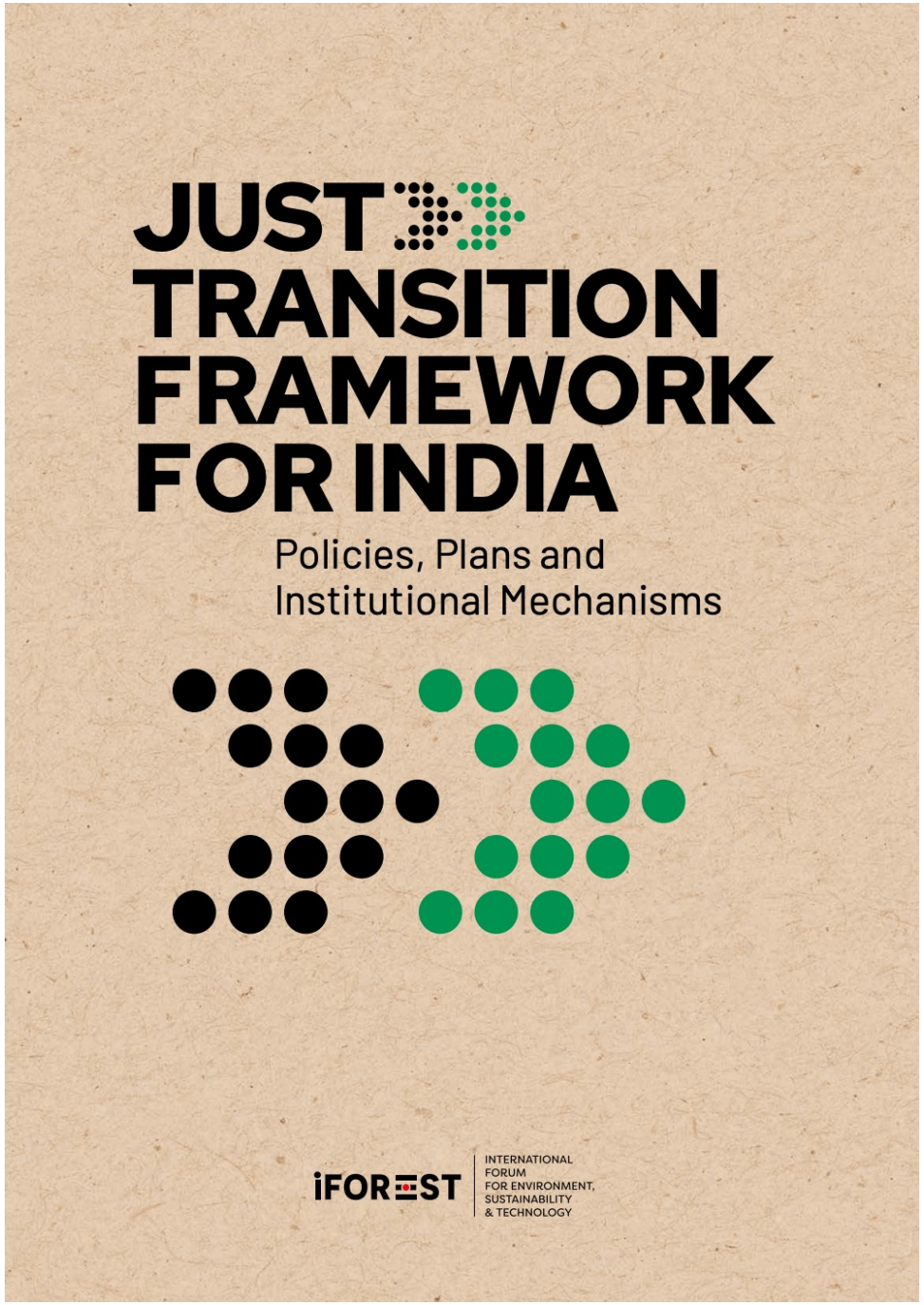
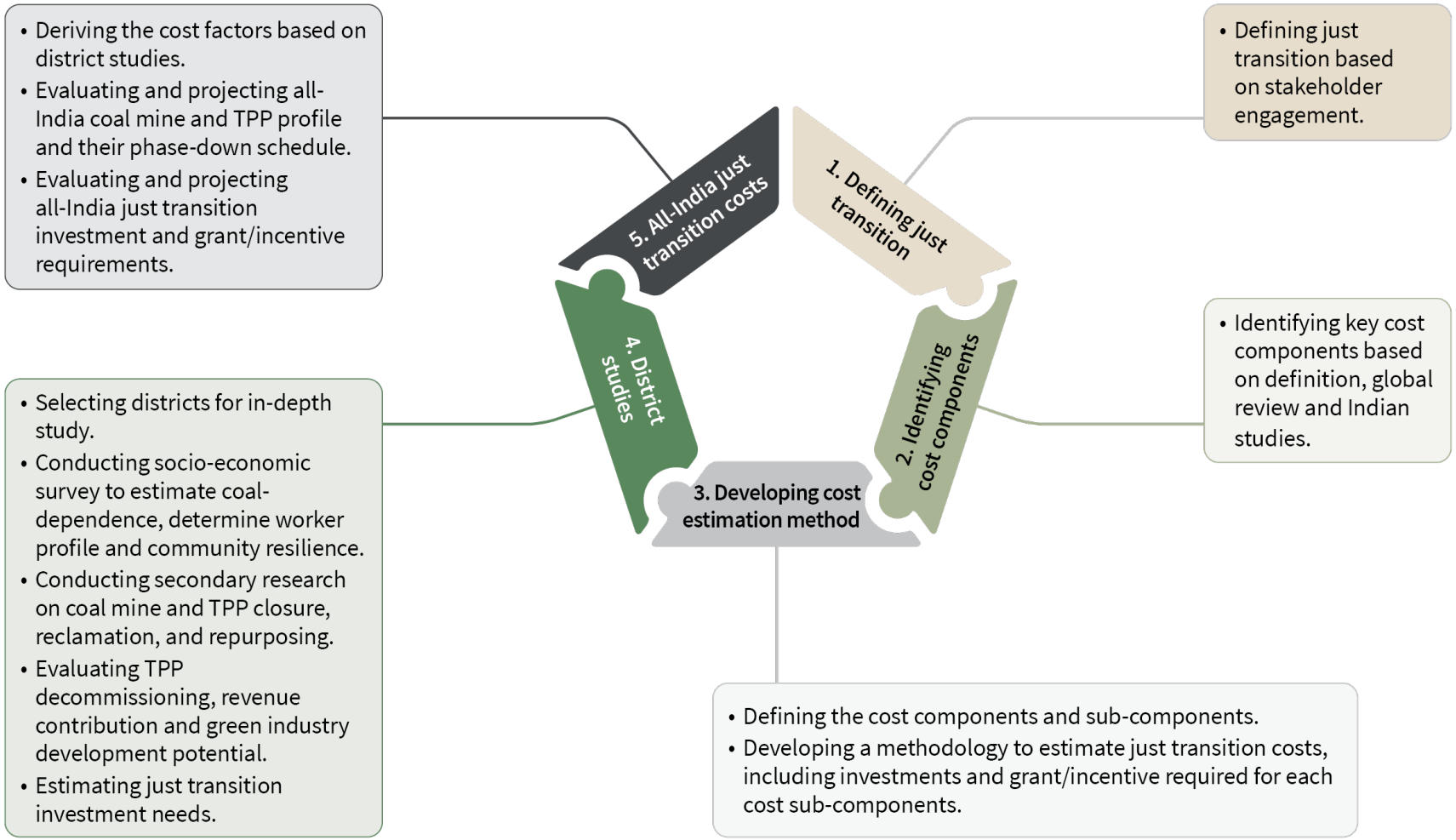


Need for a Methodology for Estimating Just Energy Transition Costs

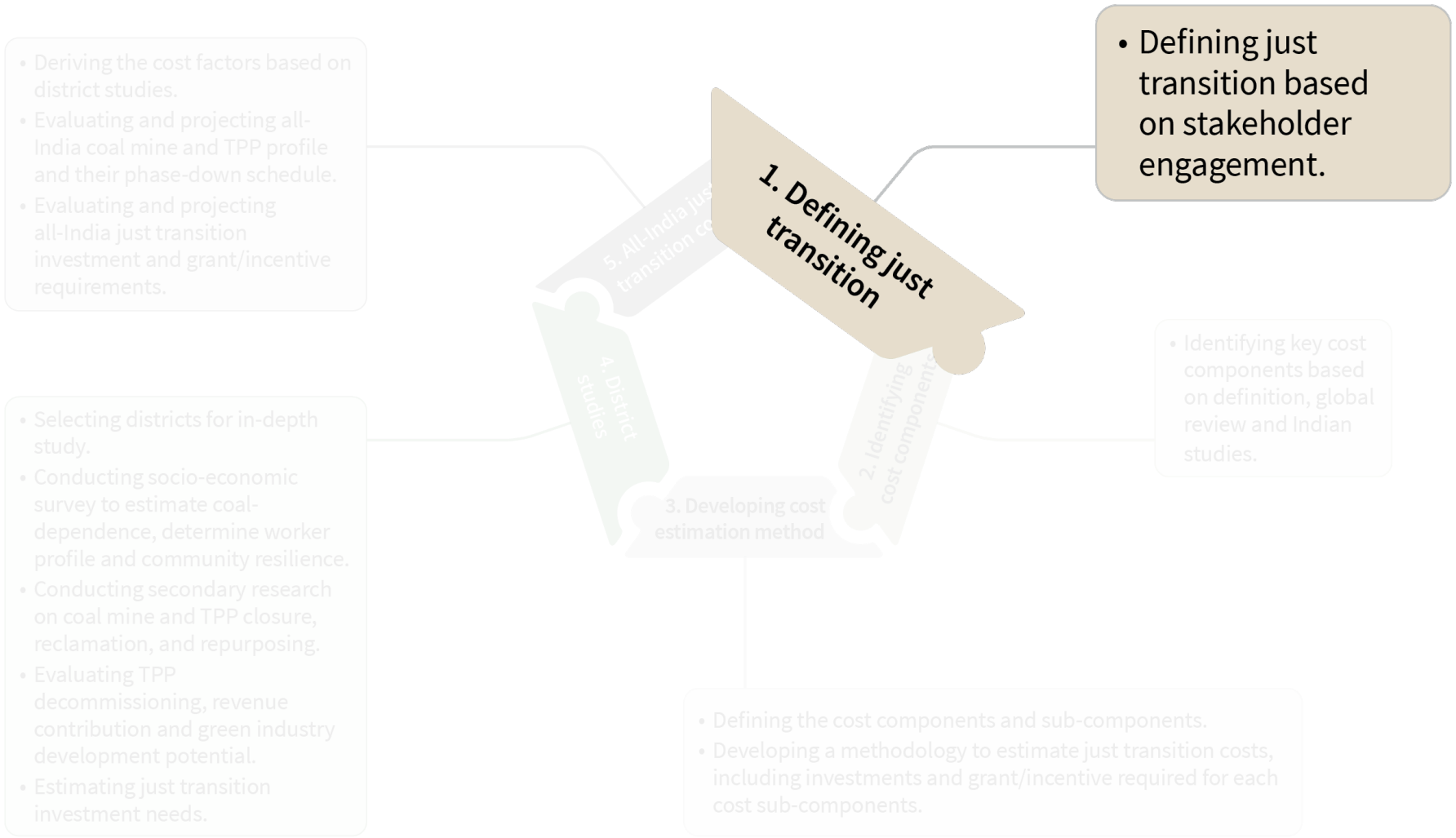
1. No established empirical method to estimate the cost of a just energy transition.
2. Costs are based on broad estimations, thumb rules, and most often a negotiated amount.
3. Absence of a comprehensive empirical approach makes just transition investment plans arbitrary and incomparable.
4. An empirical framework for cost determination will help in **developing realistic just energy transition plans and fostering global partnerships**.

Methodology for Estimating Costs

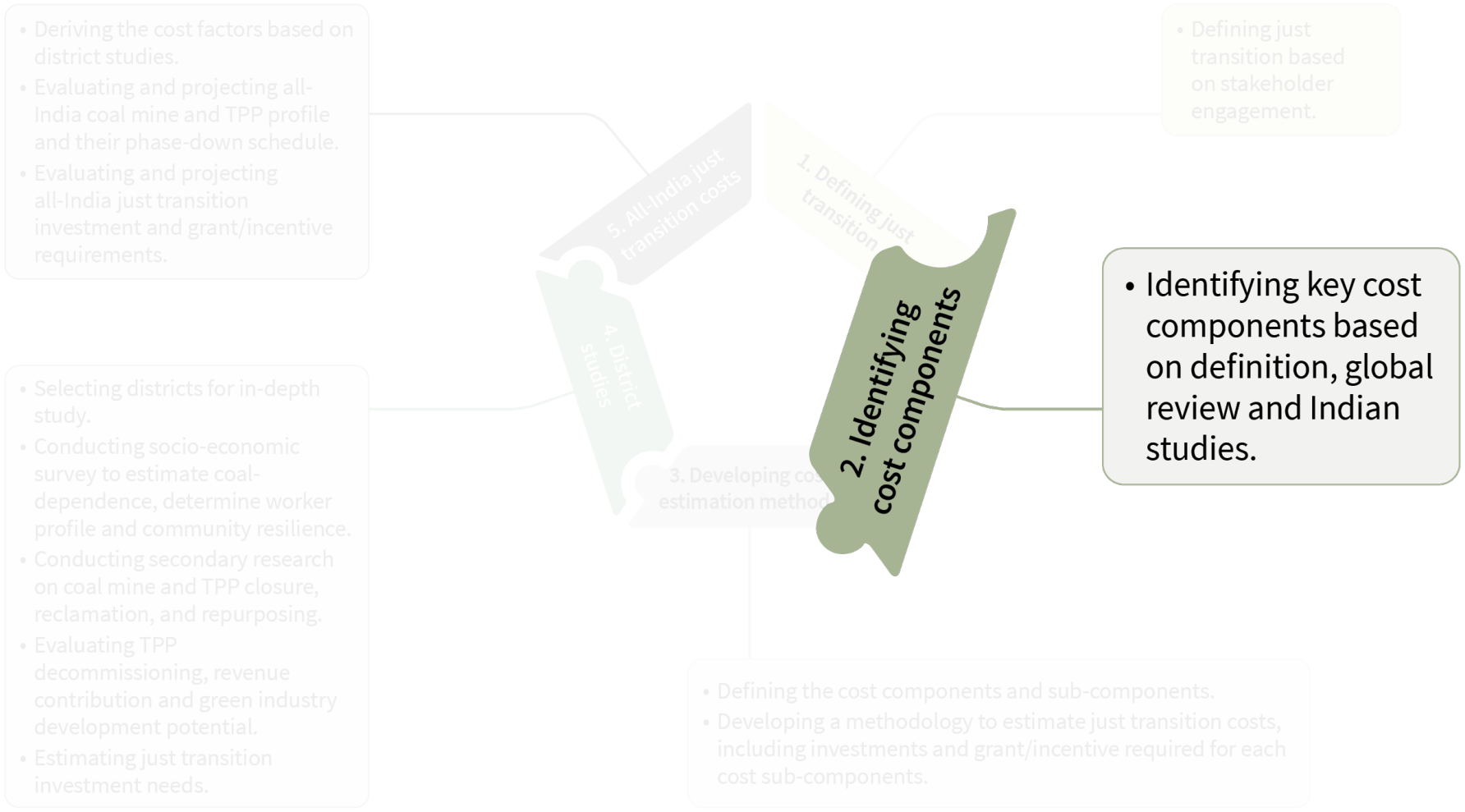
5 Step Approach



5 Step Approach



5 Step Approach



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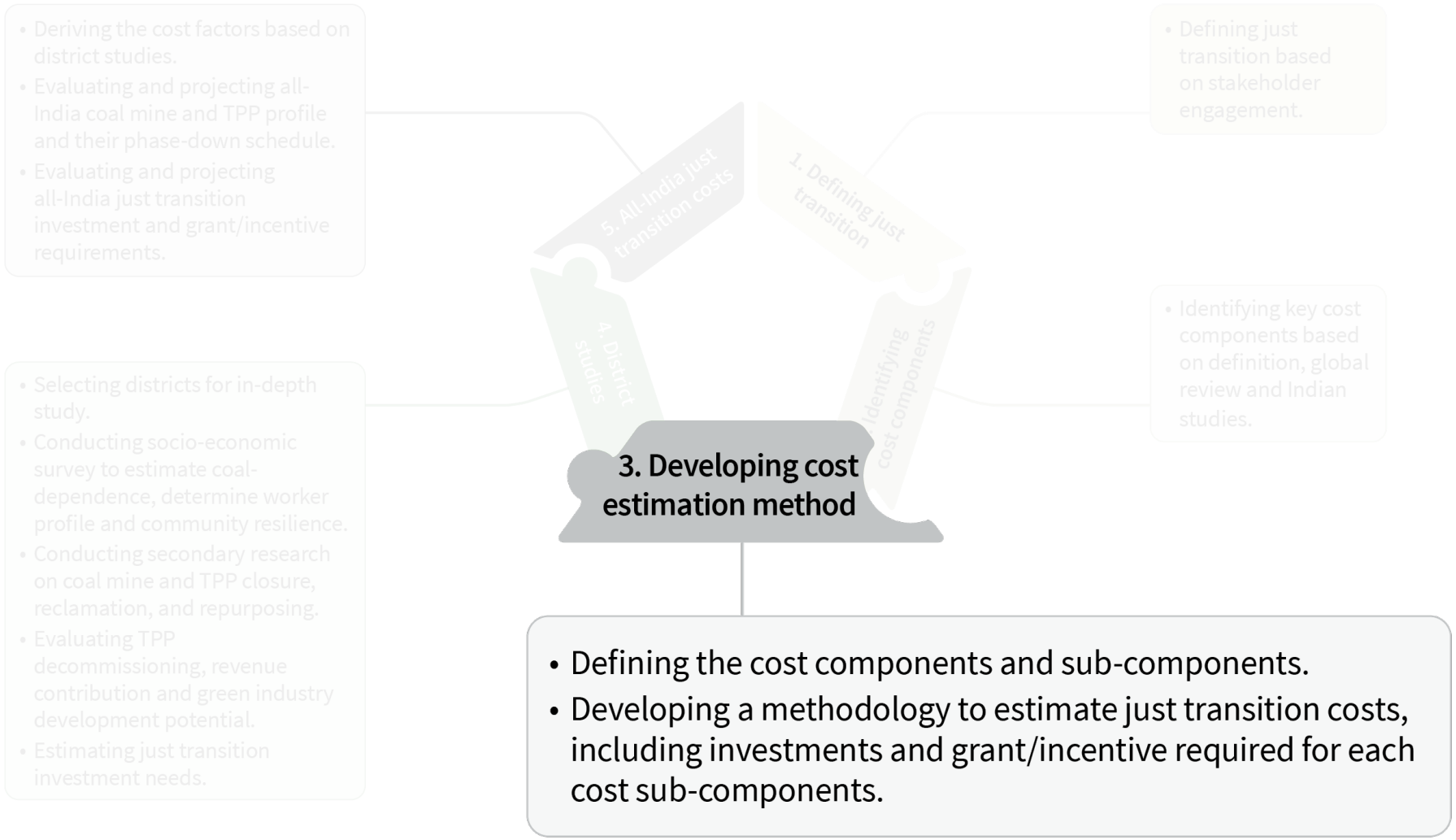
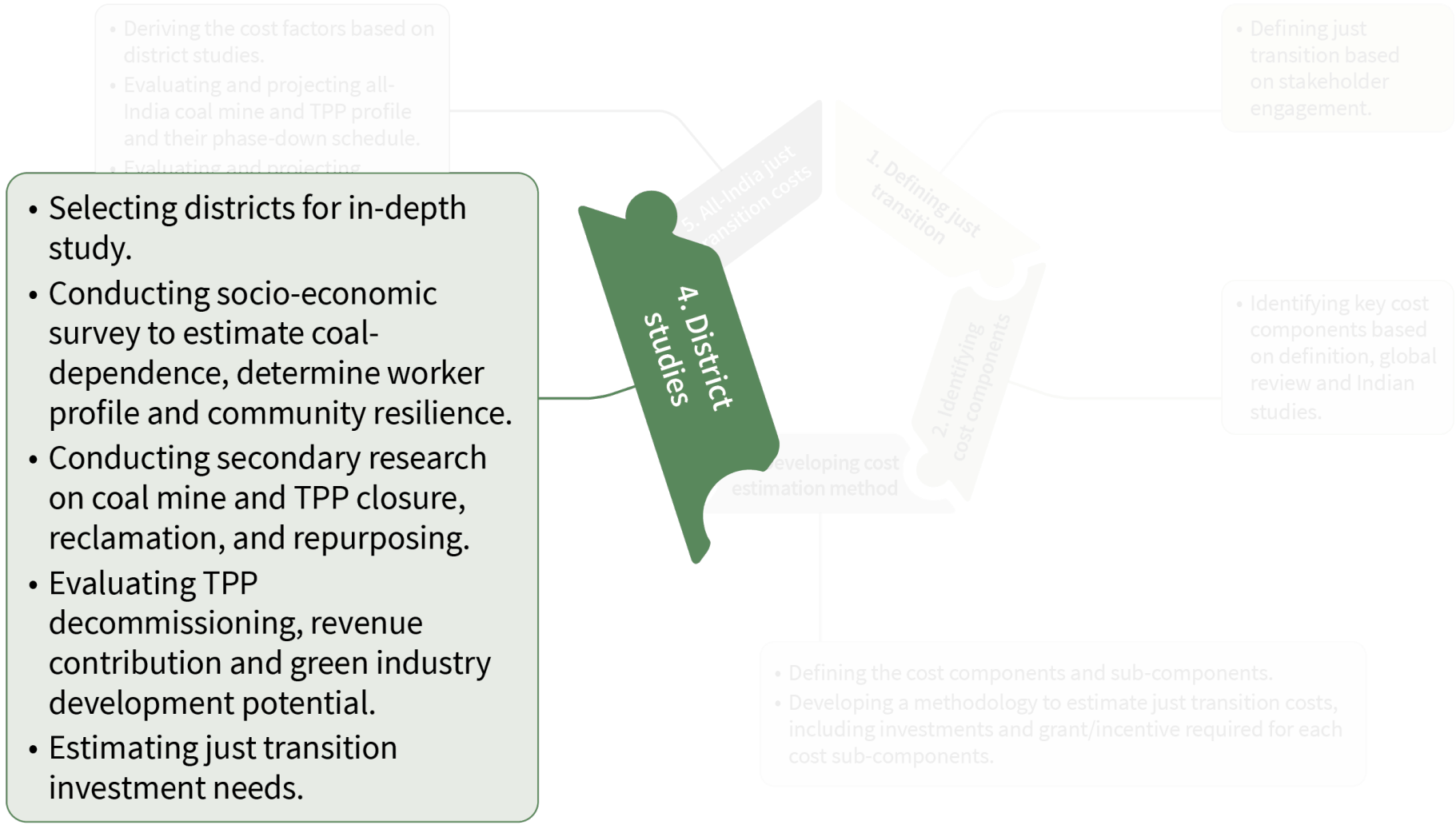


5 Step Approach



5 Step Approach

- Deriving the cost factors based on district studies.
- Evaluating and projecting all-India coal mine and TPP profile and their phase-down schedule.
- Evaluating and projecting all-India just transition investment and grant/incentive requirements.

- Defining just transition based on stakeholder engagement.
- Identifying key cost components based on definition, global review and Indian studies.
- Selecting districts for in-depth study.
- Conducting socio-economic survey to estimate coal-dependence, determine worker profile and community resilience.
- Conducting secondary research on coal mine and TPP closure, reclamation, and repurposing.
- Evaluating TPP decommissioning, revenue contribution and green industry development potential.
- Estimating just transition investment needs.
- Defining the cost components and sub-components.
- Developing a methodology to estimate just transition costs, including investments and grant/incentive required for each cost sub-components.

1. Defining Just Transition

Suited to national/regional circumstances and priorities

Key Outcomes for India

1. Builds a resilient green economy to meet net zero target by **developing new green businesses** and by **supporting fossil fuel-dependent businesses to shift to green energy and industry**

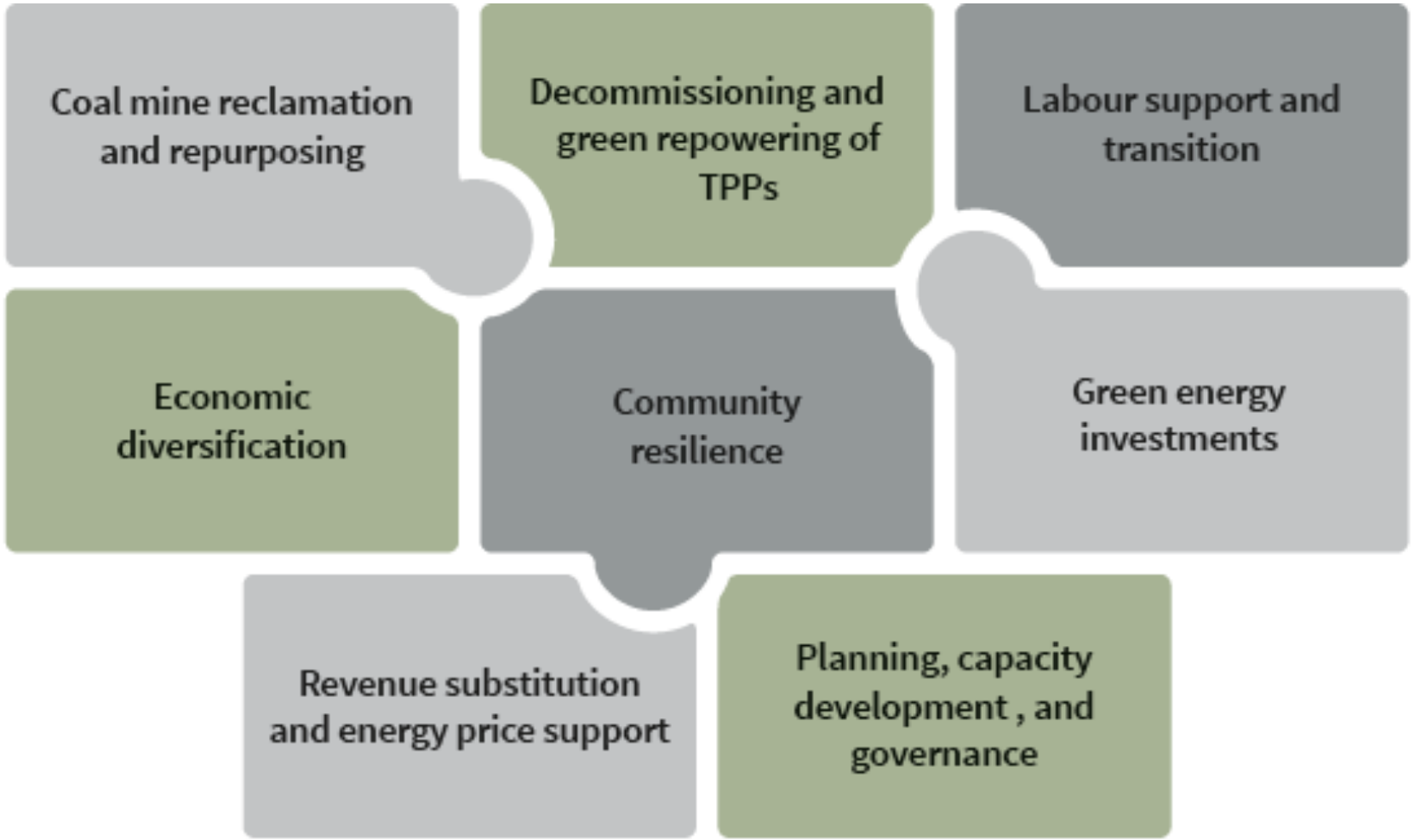
2. **Improves the social, economic, and environmental resilience of coal-dependent regions**, including from climate change impacts

3. **Supports workers and communities** affected by the fossil-fuel phase-down in a manner that they are better off than before

4. **Enhances energy security** and access by at least substituting the existing fossil fuel-dependent energy generation systems with equivalent green energy

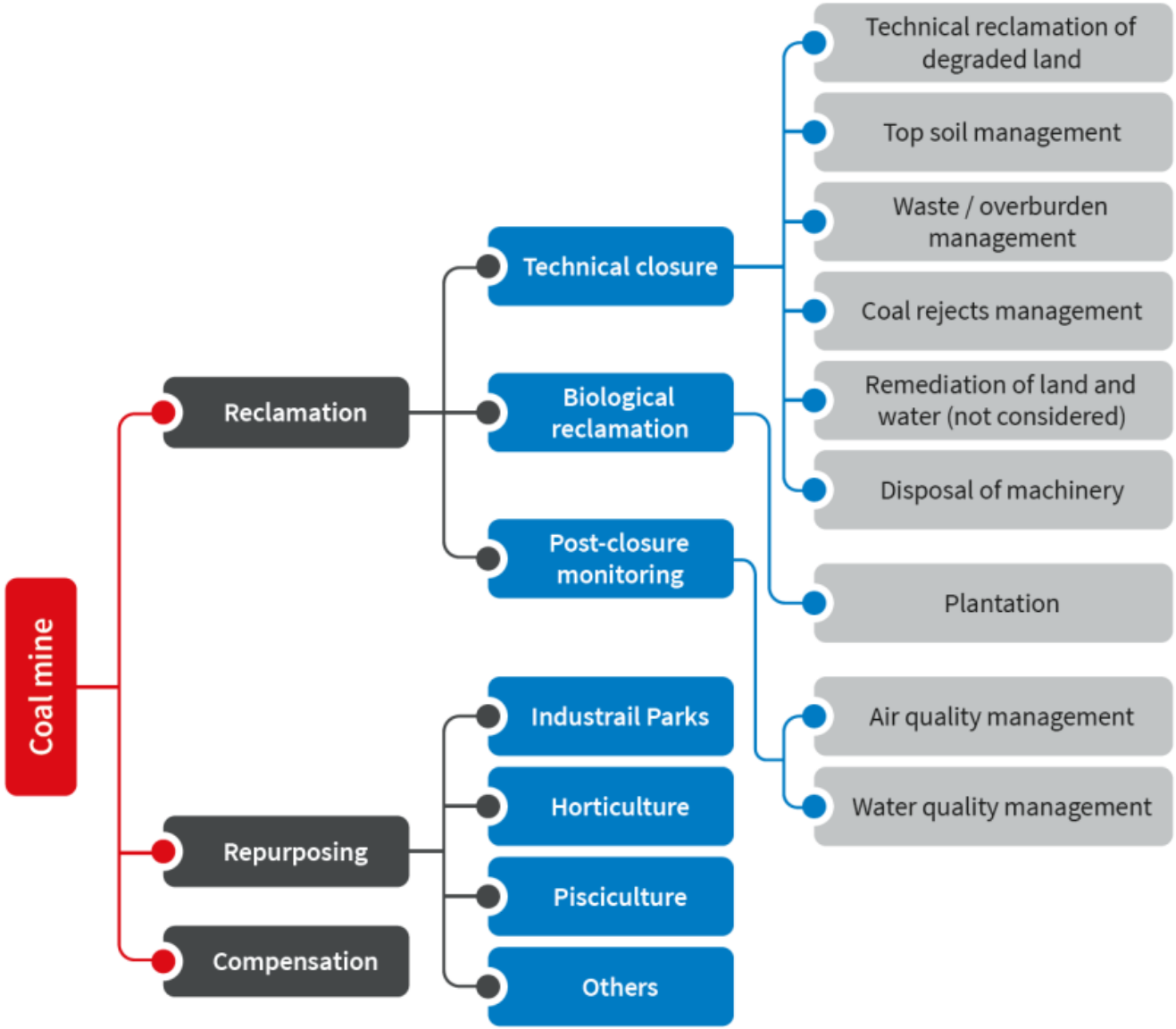
5. **Ensures an inclusive process** by including all stakeholders in decision-making

2. Identifying Cost Components



3. Cost components & cost estimation method

Coal mine reclamation and repurposing



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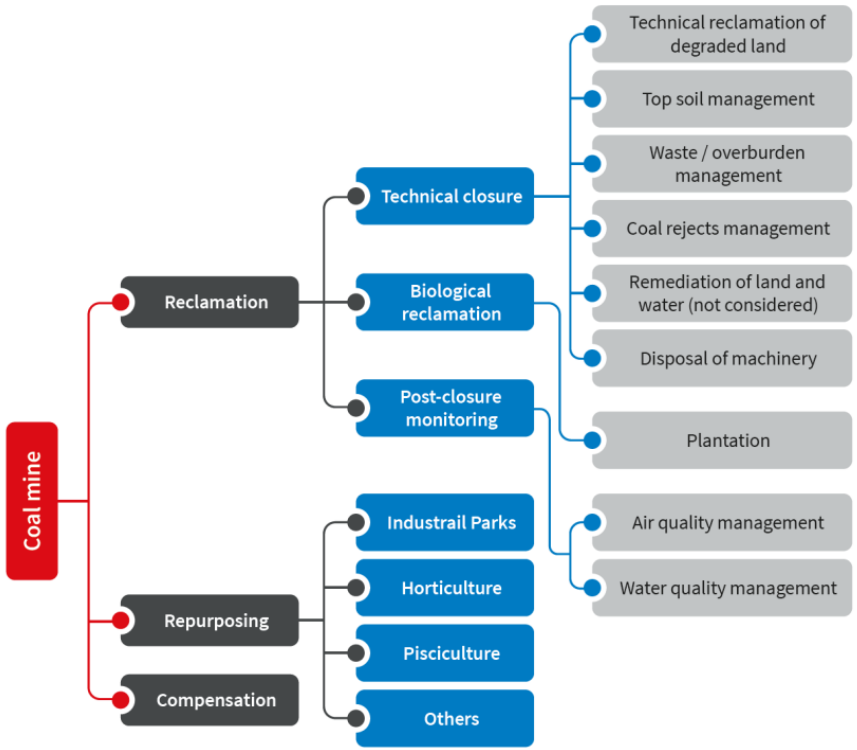
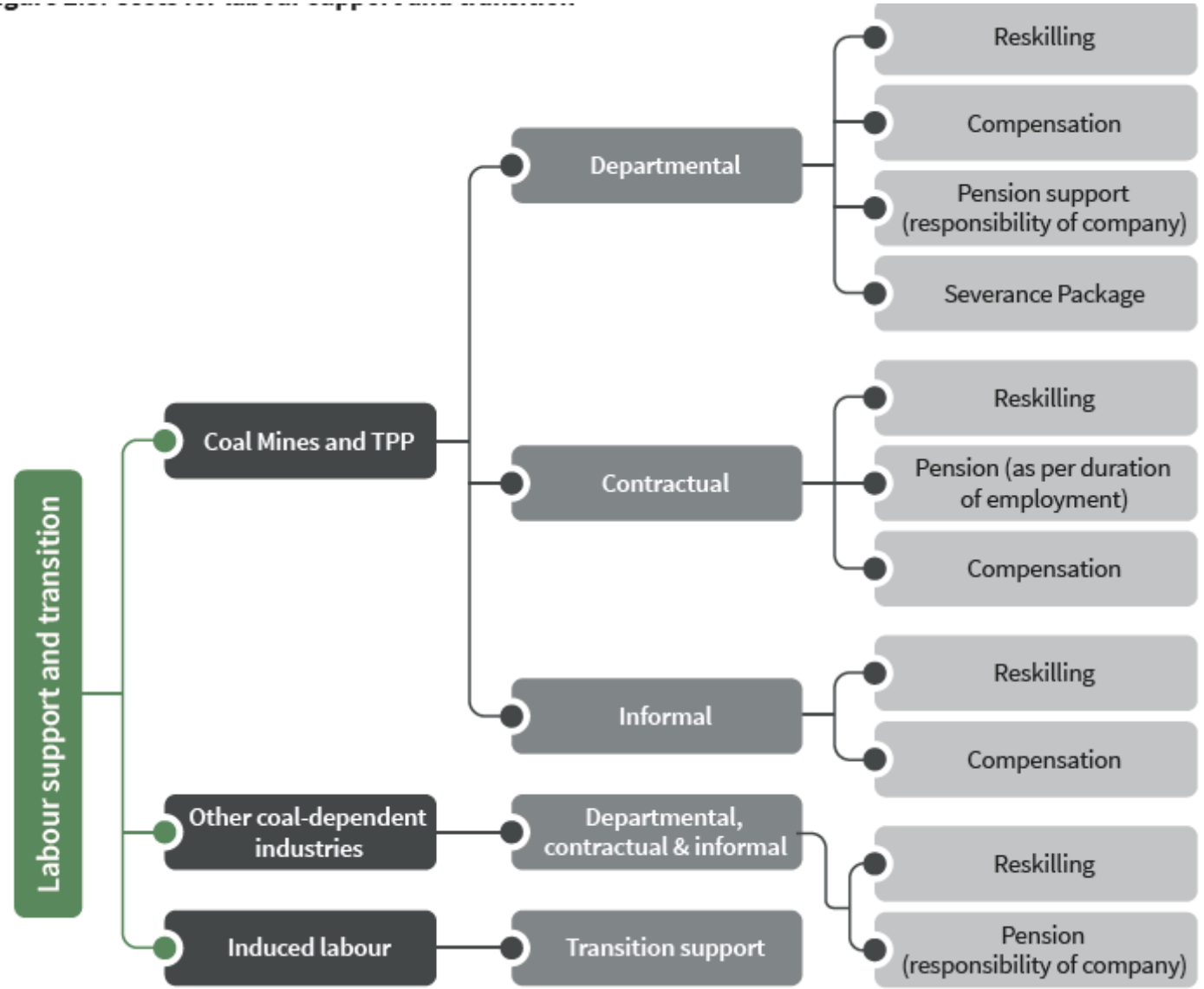


Reclamation costs	**Categorizing all OC coal mines in 6 categories.**
	50 OC mines (minimum 5 mines in each category) analyzed for determining reclamation cost factors; 15 UG mines analyzed
	Average cost rates for each reclamation activity OC and UG mines determined through review of mine closure plans, progressive mine closure audit, and expert consultations
Repurposing costs including incentives	**Estimated for activities such as solar plants, development of industrial parks, horticulture, and pisciculture in reclaimed mine land**
	Total mine lease area considered as the post-mining land to be available for repurposing
	Cost factors for repurposing activities derived from government records/estimated, similar project reports.
	Incentive required for mine reclamation is the actual reclamation cost vs. escrow amount
	Incentive for business based on current industry and energy policies.
Compensation	**Cost factor based on per tonne of coal**
	Total compensation is for the amount of coal that will be left unmined in the existing and upcoming coal mines in 2050

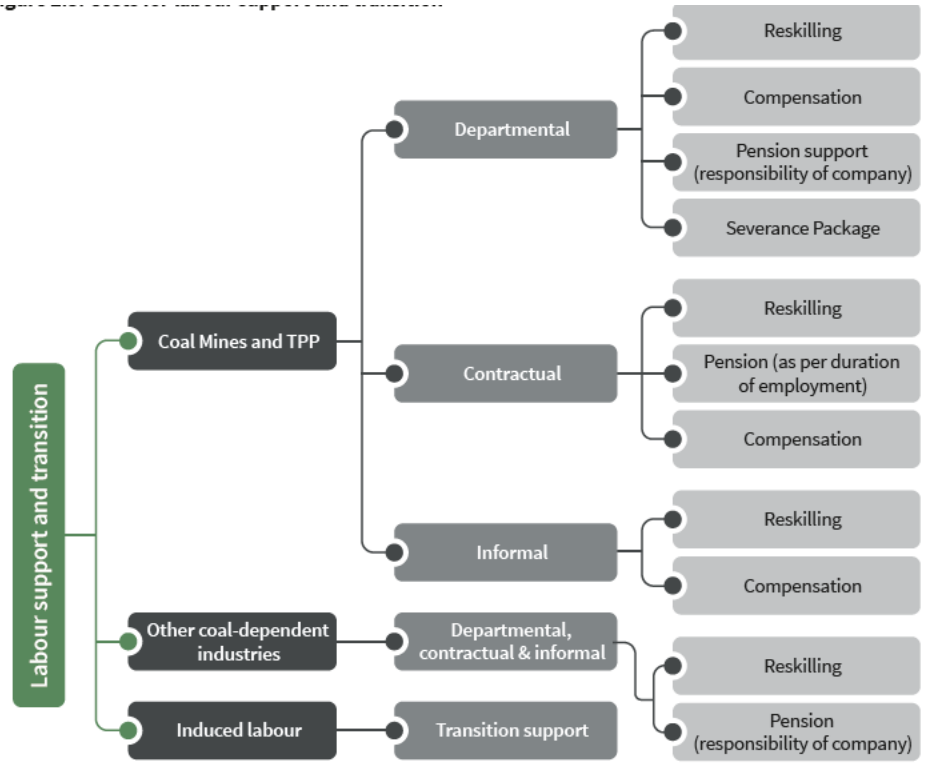
3. Cost components & cost estimation method

Labour support and transition



3. Cost components & cost estimation method

Labour support and transition



Reskilling costs	All departmental (permanent) and contractual coal mining and TPP workers <40 yrs,, and 50% of the workers between 50-60 yrs at time of closure; all informal workers; departmental workers of other coal based industries
	6-12 month training period
	Training cost- For departmental and contractual workers based on unit costs of private coal companies/MDOs; for informal workers rate prescribed by the Ministry of Skill Development and Entrepreneurship
Severance pay	50% of executives and workers who are 50 yrs plus at time of closure
	One time package; amount equivalent to 3 yr salary based on the last drawn salary of executives and non-executives
Compensation	For all contractual and informal workers
	12-month period, including wage loss, 6 months of training, and 6 months job search
	As per rate of Join Committee of CIL and workers unions
Transition support for induced workers	9 month support
	Based on the national minimum wage rate as applies to the administrative units of the coal states/districts

4. Pilot Study (District Studies)

District Studies

District	Key characteristic	Reflecting transition timeframe
Ramgarh	Old coal region, mines facing financial viability and resource exhaustion issues. Out of 25 mines, 70% are non-operational. 50% of operational mines are unprofitable.	**Immediate**
Bokaro	Old coal mines and TPP; Out of 18 mines 38% are non-operational; 35% of operational mines are unprofitable TPPs are old and inefficient; Units are being retired and dismantled	**Immediate**
Korba	While the second largest coal-producing district, production is plateauing and is expected to peak by 2030. Presence of grid and captive TPPs	**Mid-term; 2030 onwards**
Angul	Third largest coal-producing district and rapidly expanding. If the current trend continues, 300 MT will be produced by 2033. No significant reduction in coal production is expected even by 2040. Presence of grid and captive TPPs	**Long-term; post 2040**

4. Pilot Study (District Studies)

Coal-dependence assessment

- **Coal dependence** for income and services by companies
- **Worker profiles-** direct, indirect, and induced workforce
- **Community resilience-** status of social and physical infrastructure, potential for economic growth and jobs in other economic sectors, and related aspects

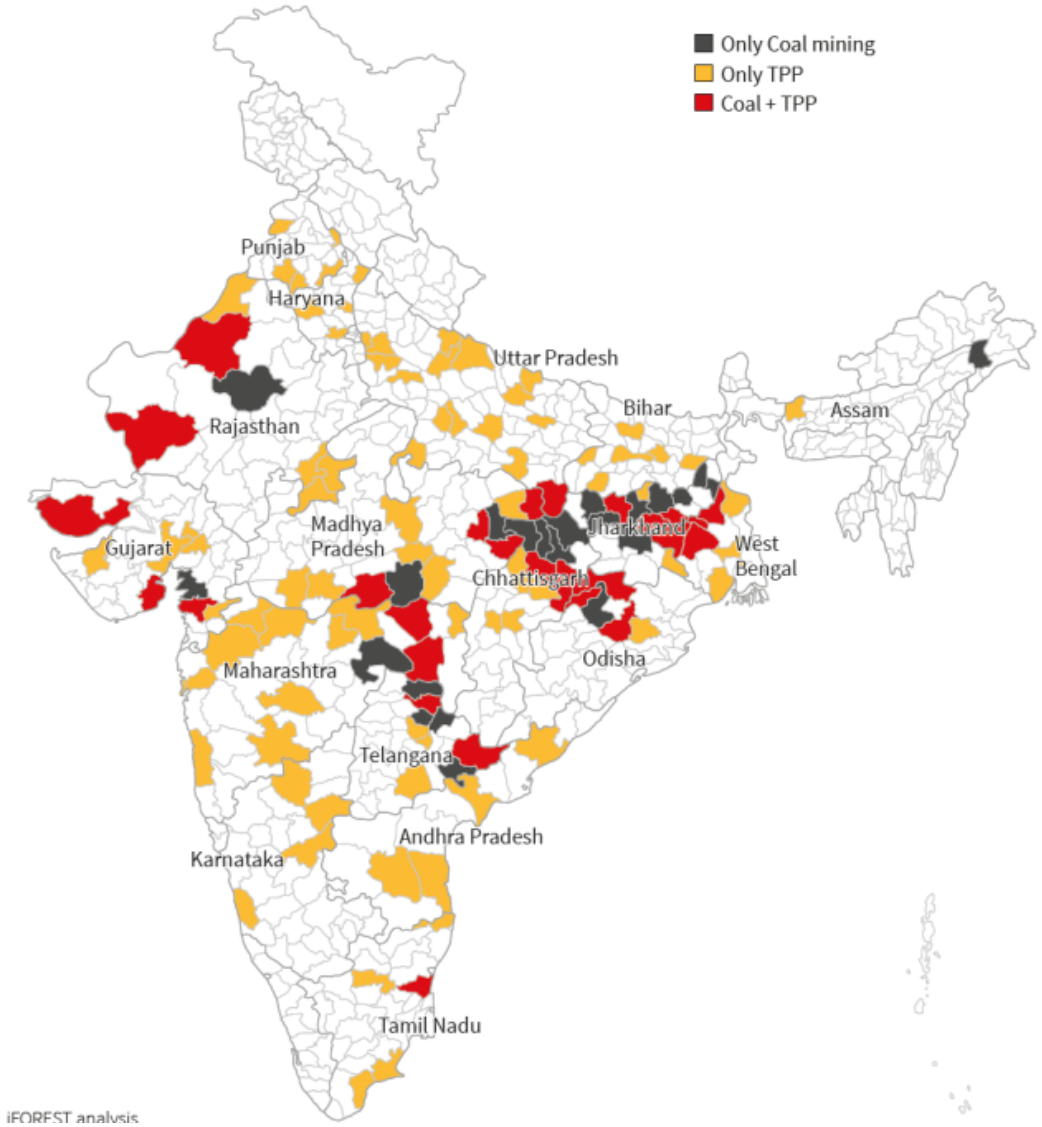
Techno-economic assessment

- **Coal mine and TPP phase-down timeframe**
- **Potential for land reclamation, repurposing, repowering and green industry**

District JT cost estimation & Cost Factors

- **Worker training and reskilling costs, income support for affected workers and their families**
- **Investments in infrastructure and public services**
- **Decommissioning and repurposing coal mines and TPPs**

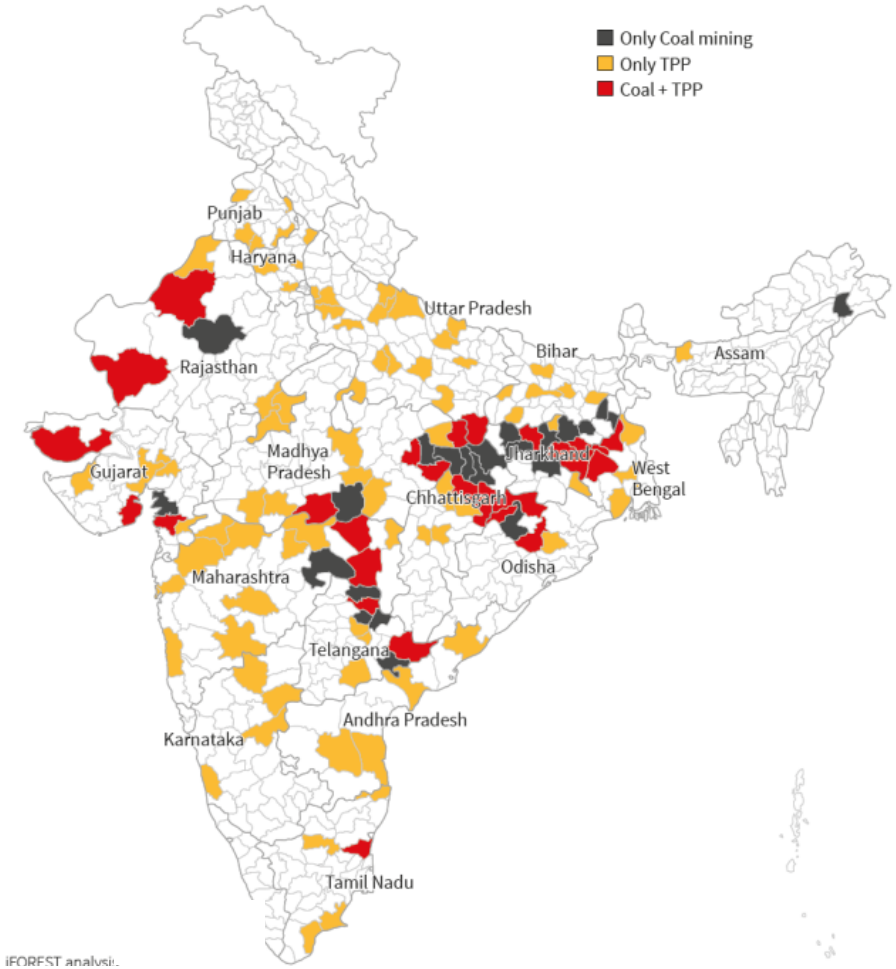
5. Determining Just Energy Transition Costs



Transition geography includes 137 districts

- 28 districts with both coal mines and TPPs
- 23 with only coal mines
- 86 districts with only TPPs

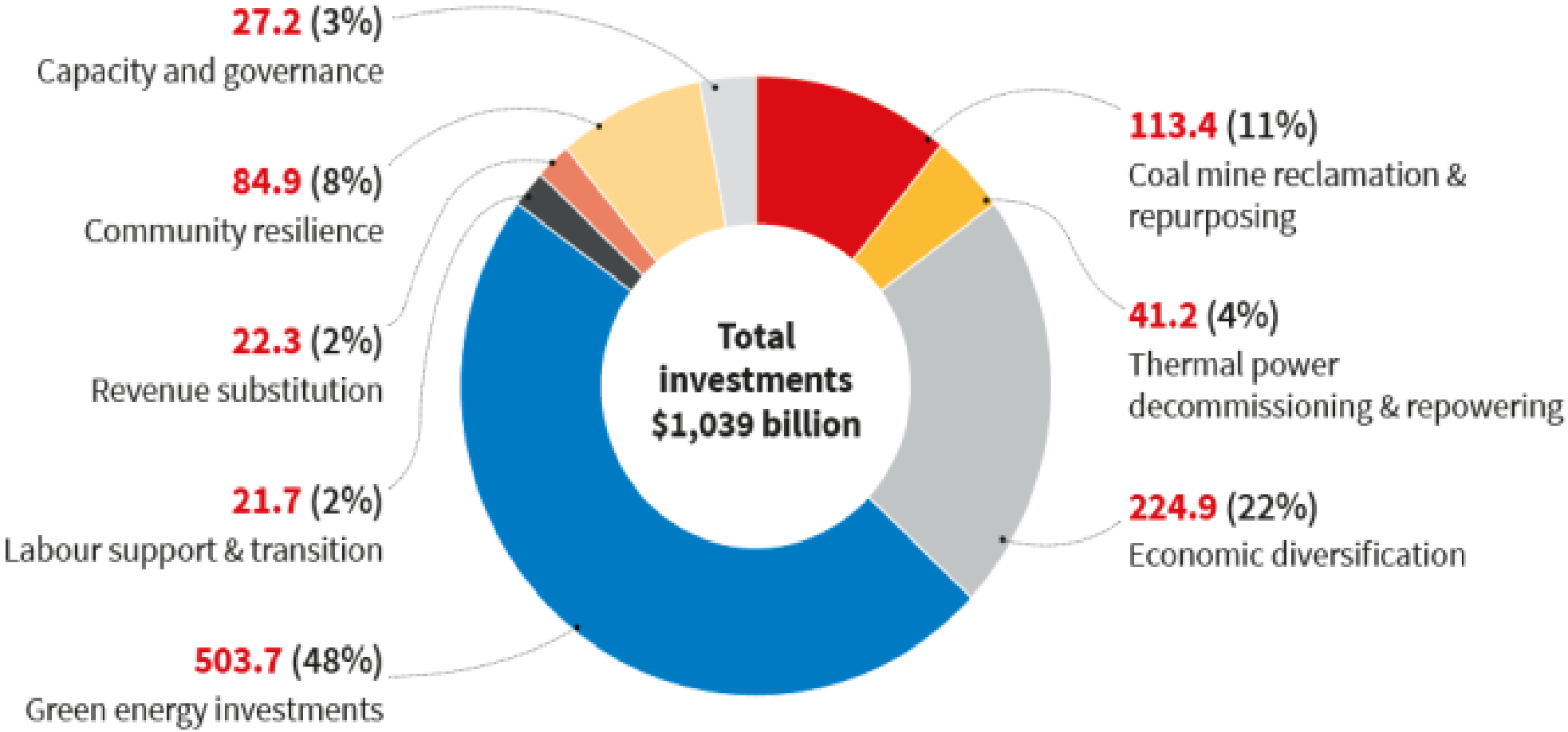
5. Determining Just Energy Transition Costs



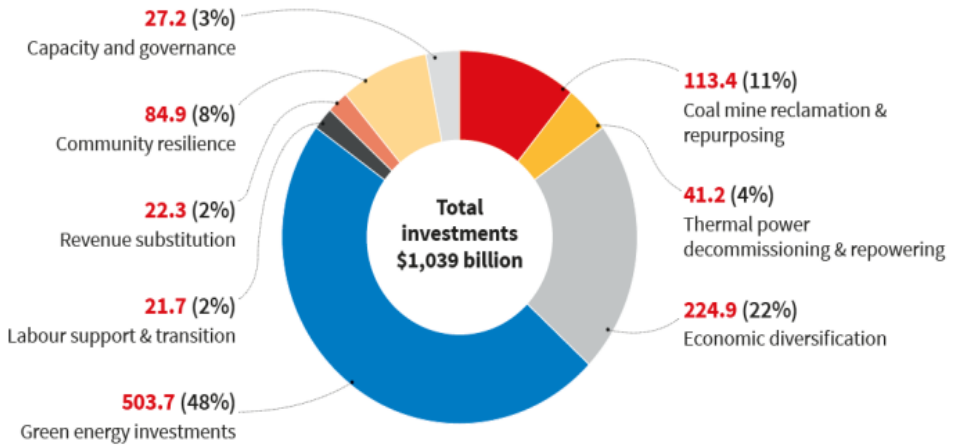
1. Overall costs assumes coal transition by 2050.
2. Considers the transition costs of closing coal mines with a **1,315 MTPA cumulative production capacity** and phasing out **237.2 GW of coal-based power capacity**.
3. Costs of include rehabilitation and repurposing of **343,504 hectares of coal mining land**, green repowering of **124,789 ha of land available at TPP sites**, and transition support for about **5.9 million workers**.
4. Costs exclude:

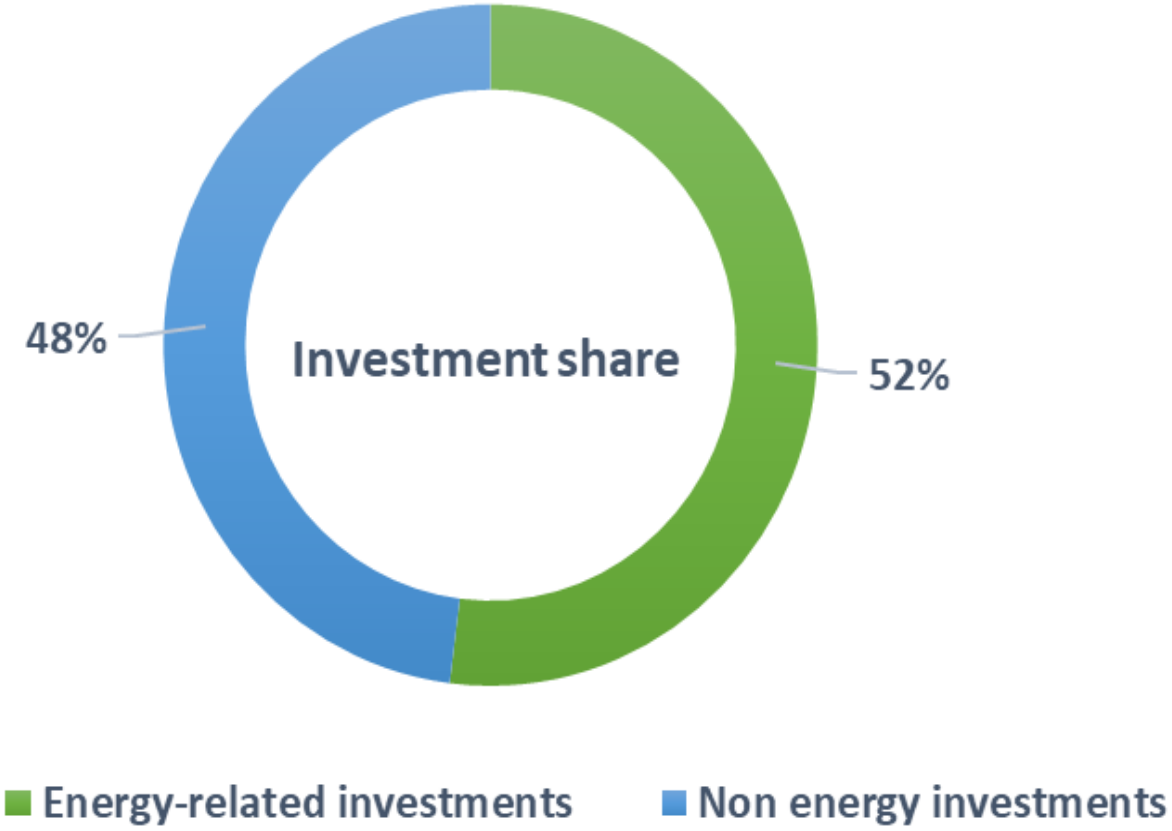
- New green energy plants to meet the country's future energy demand.
- Transitioning industries like steel and cement.
- Transition of mines and TPPs installed between 2024-2030.

Just Transition Costs for Coal and Thermal Power in India

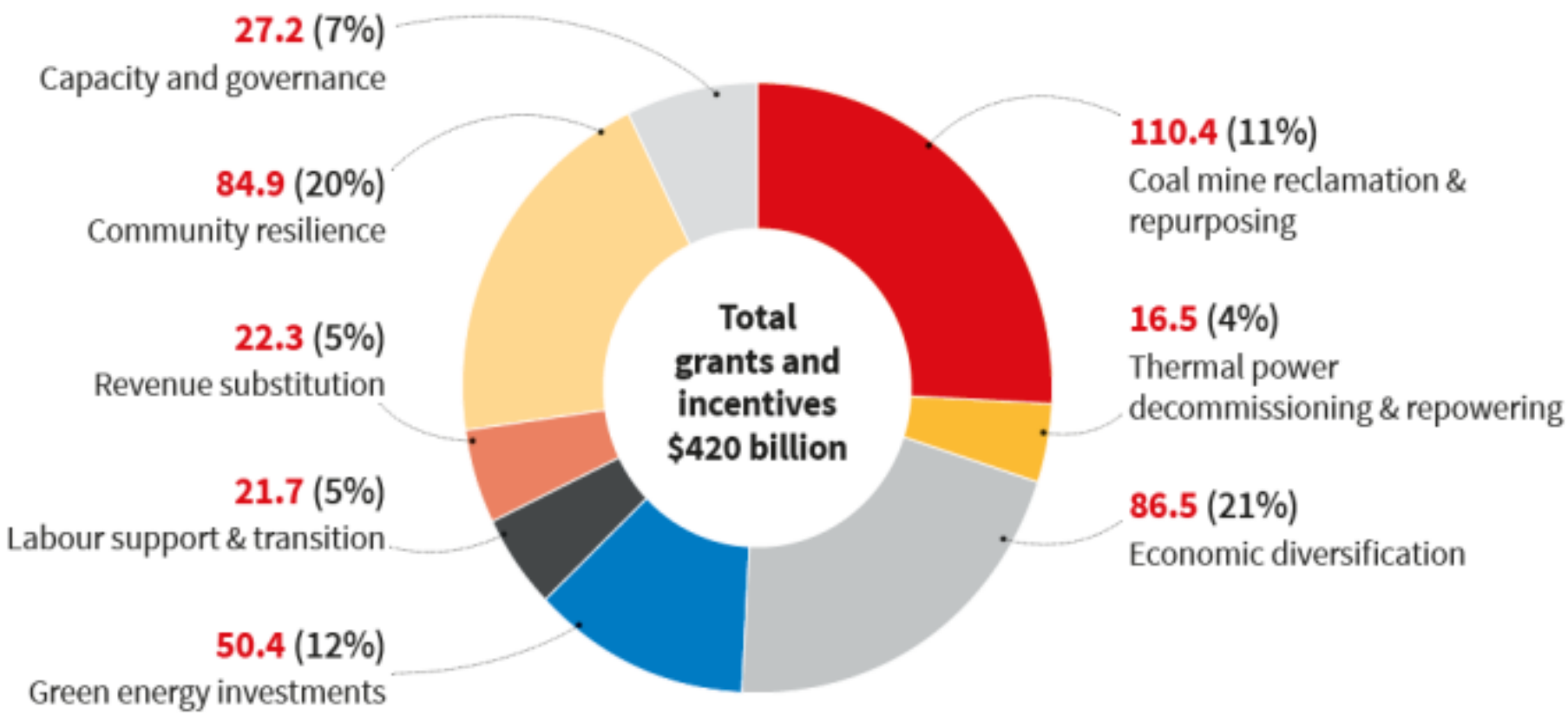


Just Transition Costs for Coal and Thermal Power in India





Support through Grants & Subsidies



Key messages

1. Methodology is robust enough to capture JET cost at facility, region and national-level.
2. Achieving Net Zero through JET will require trillions of dollars over the next three decades – JET of existing coal mines and TPPs will need a trillion dollar.
3. Grants and subsidies, through domestic and international support, will be determining for implementing non-energy component of just transition measures.
4. Domestic resources available to start investing in just transition – DMF, CSR and Coal Cess.
    - ***a. Rs. 30,000 crore ($3.7 billion) with DMFs in various coal districts.***
    - ***b. Coal Cess of Rs. 40,000 crore ($5.0 billion) every year.***
5. International support of hundreds of billions required for JET.
6. International financing will need to be more ambitious, increase the scope of grants and concessional loans, create enabling environments for private investments.