Five R's

A cross-sectoral landscape of Just Transition in India

Summary for Stakeholders

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Just Transition approach will be determined by the energy transition pathways

India's trajectory for energy transition will determine the policy and planning approach for the just transition. Two recent modelling studies on net-zero emissions pathways for India provide a glimpse of possible trajectories to reduce fossil fuels over the next three to four decades.

a. India Energy Outlook (IEA, 2021): This India-specific report projects India's energy systems development till 2040. One of the scenarios considered in the report is the Sustainable Development Scenario (SDS). The SDS essentially explores how India could mobilise an additional surge in clean energy investment to produce an early peak and rapid subsequent decline in emissions to reach net-zero by the mid-2060s. Under this scenario, India's coal demand will have to halve by 2040 and reduce by 85% by 2050. Natural Gas can increase three-fold by 2040 and be 2.5 times the 2019 levels in 2050. Oil can increase by 15% by 2040 and then reduce by 30% by 2050.

Table 1: Net-zero pathway by mid-2060

Fossil-fuel sector	SDS			
	2019	2030	2040	2050*
Coal demand (Mtce)	590	454	298	100
Oil demand (mb/d)	5.0	6.2	5.8	3.48
Natural gas demand (bcm)	63	144	210	150

* IEA has provided data only till 2040. For 2050, an extrapolation has been done assuming that coal will reach zero by 2055, oil by 2065, while gas use in 2065 is similar to 2020. At these consumption levels, India will reach net-zero in 2065.

b. India: Transforming to a net-zero emissions energy system (TERI and Shell, 2021): This report explores the pathways to steer the domestic energy system towards net-zero emissions by 2050. The report, which remains cautiously optimistic about achieving a net-zero emissions energy system by 2050, heavily relies on technological advancements and policy support to achieve it. However, the pathways in this report project less reduction in coal demand (by 60%) and more reduction in oil use (60%) by 2050 compared to the IEA report. The natural gas use increase, however, is the same — three-fold by 2050 compared to current levels.

Table 2: Net Zero pathway by 2051

Primary Energy requirement (Mtoe)	2021	2051
Coal	505	216
Oil	222	89
Gas	53	149
Nuclear	19	45
Hydro	21	33
Solar	93	876
Wind	27	548
Bio/Waste/other	92	204

Source: TERI and Shell, 2021

From the two modelling studies, what can be concluded is that the transition pathways depend on assumptions on factors such as cost, technology, energy security, etc. What is, however, clear is that in any net-zero scenario, coal use will have to go down sharply, while gas use can increase three to four-folds. Oil consumption will also have to go down, but it will depend on the interplay of cost, alternatives, and energy security.

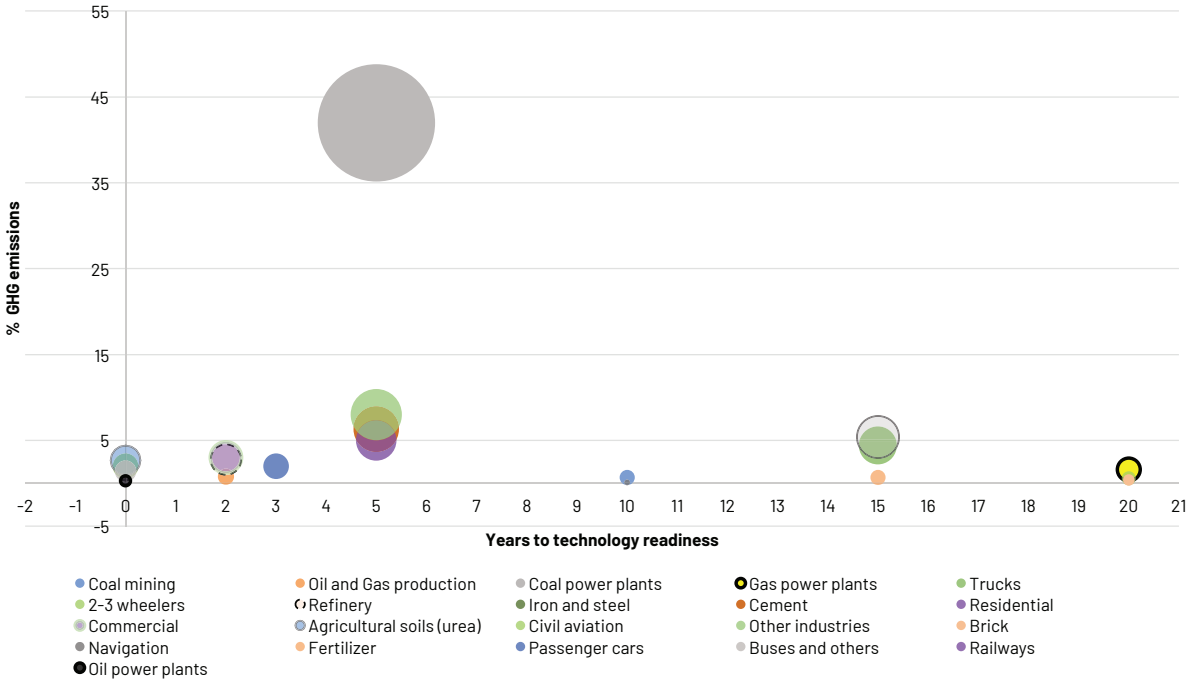
Therefore, policy and planning for transition in the coal sector should be prioritised from a just transition perspective.

Just transition should be prioritised for sectors with significant emission reduction potential and competitive alternate technologies

The assessment of greenhouse gas (GHG) emission reduction potential and availability of competitive alternate technologies suggest that the sectors that need to be prioritised for a just transition include coal mining, thermal power plants, road transportation, other industries, and agriculture soil (Urea use). These sectors collectively emit 64% of India's GHG, and 90% of technologies required for the transition in these sectors will be commercially available in the next five years (Figure 1 and Annexure 1). Coal mining, thermal power plants and road transportation are likely to see disruptive changes both in terms of job losses and skill requirements during this decade. Other industries and agriculture soil, on the other hand, will see a progressive transition. Most other coal-dependent sectors such as steel, cement, and fertiliser will need to start planning for a just transition only in the 2030s.

Some transition is already underway in residential, commercial, and agriculture sectors, but these will have to be upscaled significantly. In agriculture, for example, reduction in urea use (which contributes to N_2O emissions) is being promoted by adopting neem-coated urea and promoting other nutrients. But this has not led to a significant reduction in use. Similarly, energy efficiency is being promoted in residential and commercial sectors, but the best-in-class technologies in building, cooling, and heating sub-sectors are not being adopted. Just transition in these sectors is mainly about progressive enhancement in efficiency, training, and capacity building.

Figure 1: Emissions vs Technology readiness



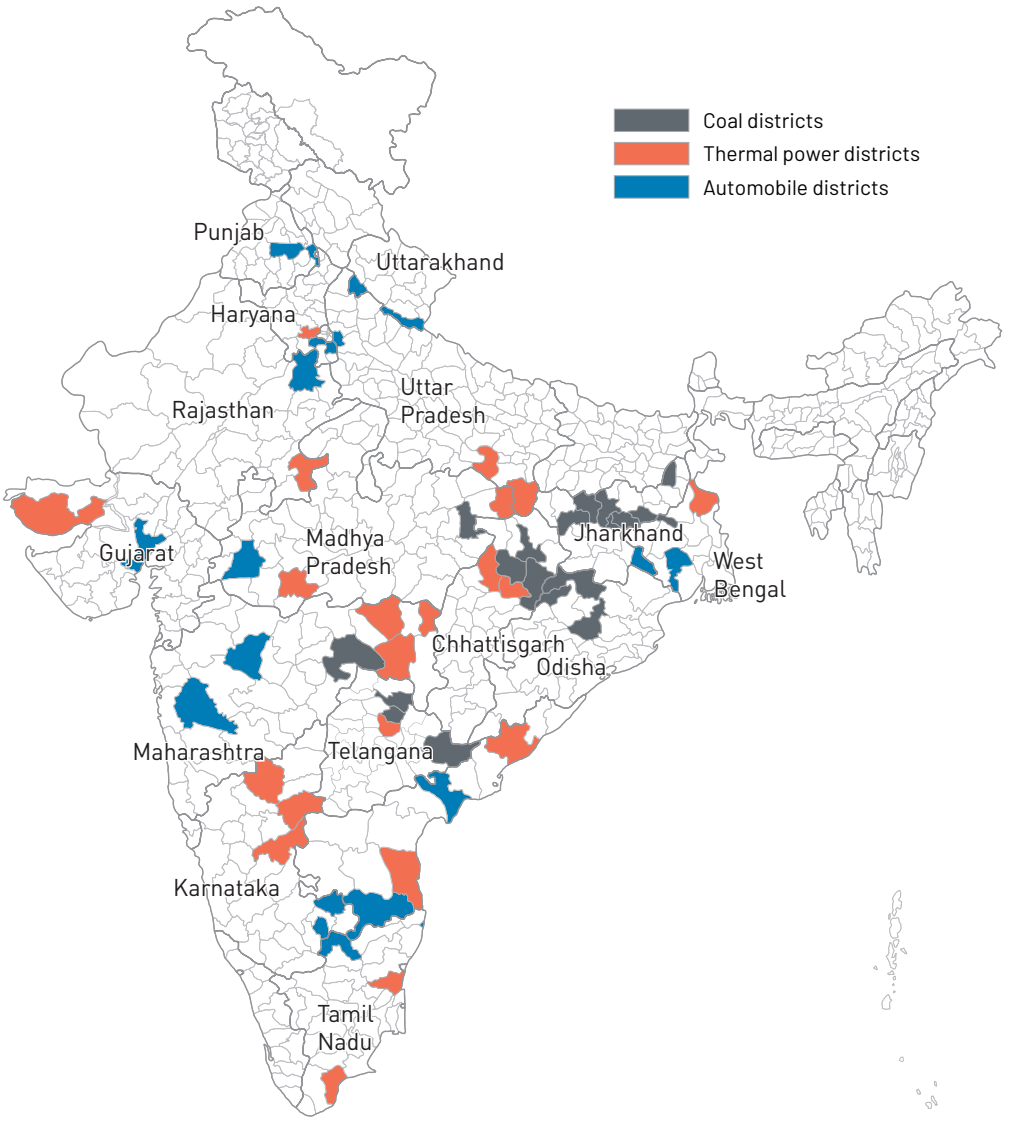
Source: iFOREST analysis

60 districts in 16 states should be prioritised for just transition

There are 120 districts (out of the 718 districts) in the country with a sizeable presence of fossil fuel or fossil-fuel dependent industries – coal mining, oil and gas production, thermal power plants, refineries, steel, cement, fertiliser (urea), and automobile. These districts have a population of about 330 million, or about 25% of the country's population.

Of the 120 districts, there are 60 districts where just transition should be prioritised as these districts account for 95% of coal and lignite production, 60% of thermal power capacity, and 90% of automobile and automobile component manufacturing. Jharkhand has the highest number of districts (8), followed by Maharashtra (6), and Chhattisgarh and Karnataka (5 each). About one-third of the districts are concentrated in the coal belt of Jharkhand, Chhattisgarh, Odisha, and West Bengal (Map 1).

Map1: The transition geography of this decade



Source: iFOREST analysis
Note: Many districts have both coal mining and coal-based power plants. For simplicity, the district that is comparatively in a higher ranking for coal mining is depicted as a coal mining district, and that with a higher ranking for thermal power capacity is depicted as a thermal power district.

Over 20 million workers are currently engaged in fossil-fuel and fossil fuel dependent industries; they will need job replacement and reskilling

The Indian economy is dominated by informal workers, with more than 90% of the workforce accounted for by the informal economy.[1] Most fossil fuel sectors reflect this dominance of informality (*Box 1: Defining informal workers in India*).

There is no consolidated data on employment in fossil fuel and fossil fuel-dependent sectors. Scattered data (typically formal manpower estimates) are available from various sources, including the Annual Survey of Industries (ASI), company-wise annual reports, publications of ministries, and various government departments. These data have been collectively considered to arrive at the employment situation in these sectors. To estimate the formal and informal division, the NSSO 68th round of survey on employment and unemployment situation of India, which provides an estimation of the proportion of formal and informal employment in various industries and sectors (as per NIC 2008 classification), has been used.[2]

Our estimates show that at least 21.5 million people work in fossil fuels and fossil fuel-dependent sectors (Table 3). Automobile, iron and steel, and coal mining are the biggest employers. In all of these sectors, the informal workforce is nearly four times the formal workforce.

Table 3: Estimated workforce (in million)

Sectors	Informal employment	Formal Employment	Total Employment
Coal mining	1.8	0.8	2.6
Coal-based thermal power (1)	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, excluding refineries (2)	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 (3)	0.2	0.02	0.22
Automobile (4)	NA	NA	12.8
Total	**6.9**	**1.8**	**21.5**

Sources: iFOREST estimates based on annual reports, Annual Survey of Industries and NSSO 68th round of survey[3].

Explanatory notes: (1) Excluding fly ash handling and processing. (2) This is formal employment in oil and gas companies. The total employment is likely to be higher, due to the large-scale use of contract workers. (3) Only urea manufacturing plants, which are directly dependent on fossil fuels for feedstock. (4). Division of formal and informal workers not available. Includes employment in servicing and dealership.

There is a difference in the spatial distribution of employment. While oil and gas and automobile employment are spread across the country, coal and coal-related industries employment is concentrated in a relatively smaller number of districts.

In some districts, the coal sector's employment is the most important contributor to the district's economy. For example, in the Korba district of Chhattisgarh, over 7.2% of the district population is formally employed by the coal-mining and coal-based power plants. However, the overall employment is far higher than this (nearly three times, considering the informal workers employed in coal mining and coal-based power). A similar case is observed for Dhanbad and Chatra districts of Jharkhand, and Angul and Jharsuguda districts of Odisha, the other key coal regions.

Defining informal sectors and workers in India

Informal worker/employment: These include unorganised workers working in the unorganised sector or households, excluding regular workers with social security benefits provided by the employers, and the workers in the formal sector without any employment and social security benefits provided by the employers.

Informal sector: The informal sector may be broadly characterised as units engaged in producing goods or services with the primary objective of generating employment and incomes for the persons concerned. These units typically operate at a low level of organization, with little or no division between labour and capital as factors of production and on a small scale. Labour relations - where they exist - are based mostly on casual employment, kinship, or personal and social relations rather than contractual arrangements with formal guarantees.

Informal economy: The informal sector and its workers and informal workers in the formal sector constitute the informal economy.

Indirect employment: This can be defined as contract workers, who are hired, supervised, and remunerated by a contractor who, in turn, is compensated by the establishment.

Source: Labour Bureau, Ministry of Labour and Employment. (2015). Employment in Informal Sector and Conditions of Informal Employment. Volume IV, 2013-14. Government of India.

Just transition will involve Five R's

A just transition in India will need policy and planning for five key elements:

1. **R**estructuring of the economy and industries;
2. **R**epurposing of land and infrastructure;
3. **R**eskilling existing and skilling new workforce;
4. **R**evenue substitution and investments in just transition; and,
5. **R**esponsible social and environmental practices.

All of these need to be considered appropriately in a sectoral and region-specific manner to ensure targeted interventions and achieve just socio-economic and environmental outcomes.

1. Restructuring of the economy and industries

Most of the top coal mining districts are mono-industry districts, which has created a dominance of coal in the economic landscape of these regions. In these districts, the economy is heavily reliant on coal mining, power plants, and coal-dependent industries. This has stymied the development of other sectors and undermined the scope of economic diversification. It has also affected people's psyche in these regions, creating a sense of 'perceived dependence'. As a result, most economic activities and income opportunities in these regions can be assumed to be somehow influenced by the mono-industry. Therefore, a critical component of just transition in India will be restructuring the economy and industries of these regions.

A well-designed industrial restructuring plan can facilitate a transition with minimum economic disruption. This will involve developing appropriate industrial policies by the concerned State Governments and district development plans in consultation with local institutions.

Besides developing low-carbon industries and attracting necessary investments for them, a particular focus of the economic and industrial restructuring should be harnessing the potential of local resources. In many fossil fuel districts, there is huge potential to boost the local economy and create sustainable industries based on agricultural and forest products, aquaculture, dairy, and sustainable tourism. For instance, on average, India's top coal mining districts have over 31% forest cover, which is 10% higher than India's average. At the same time, many of the top coal districts have significant agricultural potential, with cultivable areas

ranging between 30%-45%. However, much of this potential remains neglected due to poor market support and linkages for agriculture and forest products or inadequate investments in these sectors.

2. Repurposing of land and infrastructure

Reclamation and repurposing of mining and industrial lands (brownfields) and associated infrastructure will be important for economic diversification and socio-economic development in fossil fuel regions.

An estimated 0.45 million hectares (ha) of land is available with coal mining and major coal allied industries, including coal-based power, iron and steel, and cement.[4] In fact, only coal mines and power plants account for about 0.3 million ha of land. In some districts, coal mining companies hold as much as 10% of the geographical area.[5]

The available land provides a massive scope of creating immediate and long-term economic opportunities. In the short term, land reclamation and redevelopment will require the engagement of large numbers of skilled and unskilled workers, creating direct employment. Moreover, well-planned infrastructure projects with complementary investments can also have a far-reaching benefit for the local economy.[6] However, certain reforms would be required in the land acquisition and reclamation laws to allow for the smooth repurposing of land and infrastructure. This includes modifications in the mine reclamation, land use change, and ownership laws.

3. Reskilling existing and skilling new workforce

The review of transition scenarios for each fossil fuel-related sector suggests three primary modes of impact on the workforce. These include:

- Job loss due to declining production and eventually closing down of operations;
- Retraining and reskilling of the existing workers due to changes in production processes or repurposing of facilities; and,
- Skilling of the new workforce to meet the requirements of new zero-carbon industries.

The extent of job loss and the requirement of reskilling and skilling is related to the nature of operations of these sectors and the distribution of workforce (such as formal and informal), including their skills levels. A review of job loss versus reskilling in various sectors is elaborated in Annexure 2.

It can be inferred from the job loss versus reskilling matrix that sectors that will experience job loss are coal mining, coal-based power, and refineries. This is because there will be progressive phasing down of operations of these sectors in the coming decades. In the rest of the sectors, a well-planned reskilling and skilling programme will avoid job losses. Of course, job losses can happen for informal workers in all sectors, but a timely intervention of reskilling and retraining can help them to get readily absorbed, as there is no overall scaling down of activities or net decrease of production in the coming years in sectors other than coal mining and thermal power.

For coal mining, the challenge of job loss is far higher than coal-based power plants or refineries, considering the predominance of the informal workforce. In addition to this, there is a subsistence coal economy in many of the old coal mining regions, particularly in the coal-mining districts of Eastern India. In these regions, stretching from Raniganj coalfields in West Bengal to the Jharia and North Karanpura coalfields of Jharkhand, thousands of people earn a living by manually gathering coal selling in local markets.[7]

For job loss, the following policy and planning interventions would be required: creating alternative livelihood opportunities through industrial restructuring, supporting entrepreneurship, and harnessing the local resource base; repurposing and redeveloping the brownfield areas (as discussed above); providing pensions, compensations, and transition packages; and reskilling and retraining of particularly the younger workforce.

Investments in reskilling and skilling will be necessary for the workforce in all sectors. This is particularly important for the young formal and informal workers. Moreover, there will be a huge requirement in all low/

zero-carbon industries for skilled jobs, such as in factories for solar panels, EVs, battery, and other equipment manufacturing.

For reskilling and skilling to happen, having proper skilling policies at the Government and company levels will be important. This, in fact, is a prerequisite for just transition, particularly considering the predominance of the informal workforce, who are primarily unorganised.

4. Revenue substitution and investments in just transition

A critical issue for just transition is the substitution of public revenue from fossil fuel and related sectors. Coal, Oil, and Gas collectively contribute 18.8% of the total revenue receipts of the Central Government and about 8.3% of the total revenue receipts of the State Government.[8] About 91% of revenue contribution is from the oil and gas sector; coal contributes only about 9%. Therefore, from a just transition perspective, revenue substitution from the oil and gas sector will be a far bigger challenge than the coal sector. Also, as the oil and gas phase down is likely to happen only in the 2030s, revenue substitution is not an immediate concern and can be spread out over the next two to three decades.

The revenue loss from coal mining, however, will affect the State Governments. For states, the main source of revenue from coal is royalty and District Mineral Foundation (DMF) contributions. In most top coal states, such as Jharkhand and Chhattisgarh, the share of royalty, DMF, and taxes from coal mining to the total revenue receipt is about 5%-6%. In other coal-producing states, such as West Bengal, the contributions are far lower, about 1%-1.5%. In fact, some coal-producing states earn more by taxing petrol and diesel than by taxing coal (Table 4).

Table 4: Sales taxes from petrol and diesel, and direct revenue from coal mining (2019-20)

State/UT	Sales Tax/VAT from CPSEs (₹ Billion)		Coal mining taxes and revenues of PSUs to state (₹ Billion)
	Petrol	Diesel	
Chhattisgarh	12.67	24.84	32.21
Jharkhand	8.97	20.19	39.92
Madhya Pradesh	28.71	38.75	34.10
Odisha	15.79	38.39	29.11

Source: iFOREST analysis based on data of Petroleum Planning and Analysis Cell for CPSEs, and respective company annual reports and accounts for PSUs.; Note: Central Public Sector Oil and Gas Enterprises

Still, the public revenue substitution must be planned carefully. This is also because states will have to play a role in just transition financing through public revenue. In this context, both DMF and GST compensation tax is extremely important.

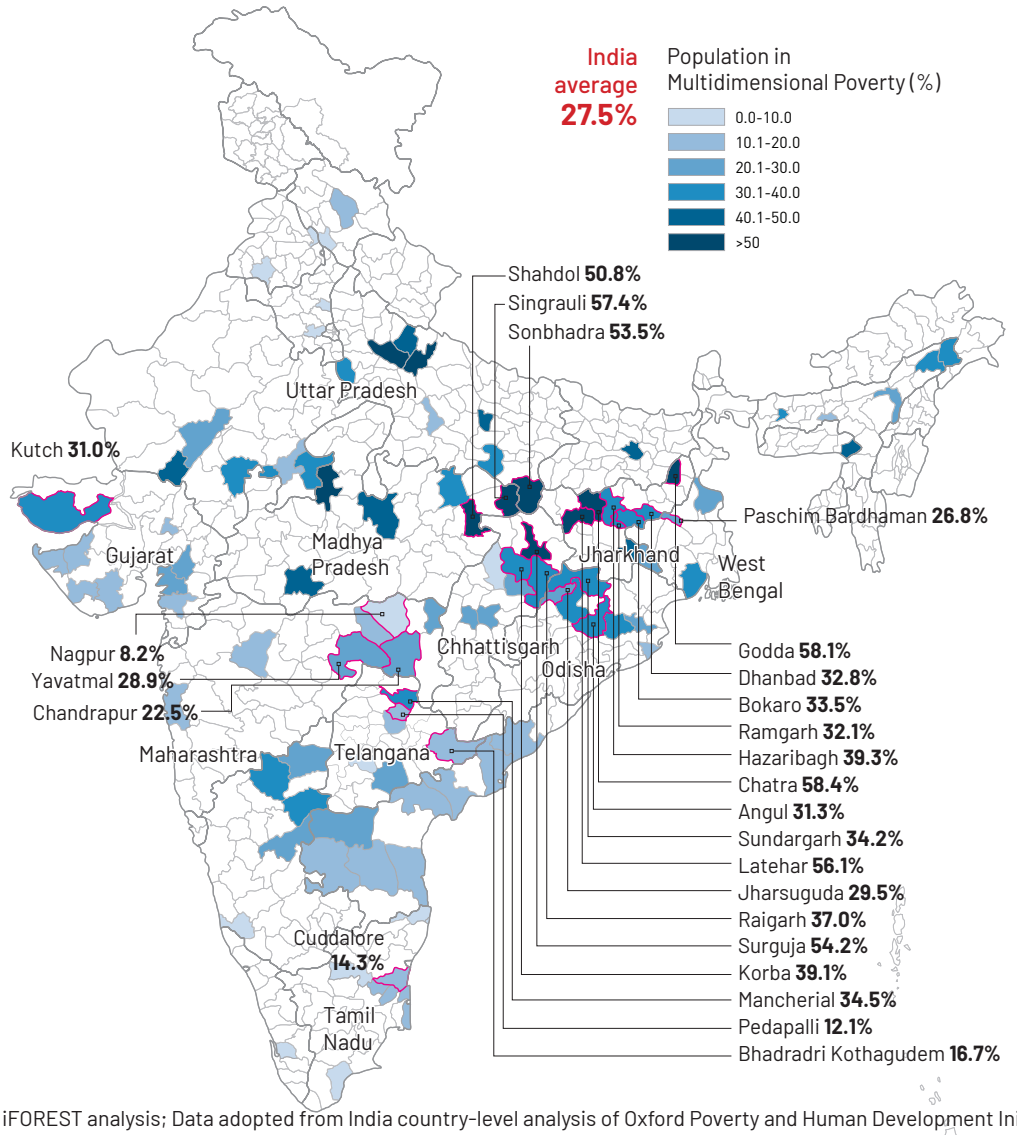
The most significant tax on coal is the GST compensation cess (originally instituted as the coal cess to fund green energy transition), levied at ₹ 400 per tonne on the dispatch of coal and lignite. The GST compensation cess in 2019-20 was an estimated ₹ 400 billion. This is almost double the revenues (taxes, royalty, and DMF) that states get from coal. However, the GST compensation cess will lapse in 2022. Post this, there is an opportunity to reverse this to coal cess and use it for just transition in coal mining areas. Similarly, DMF funds should be aligned to just transition investments, which currently have a cumulative accrual of about ₹ 184 billion in the coal-mining districts.

5. Responsible social and environmental practices

Just transition provides us with an opportunity to create a better world than what we have today. Resource extraction has led to large-scale displacement and deprivation for local communities in India. The use of these resources, on the other hand, has led to pollution and ecological destruction.

'Resource curse' is a reality in the coal districts of India. More than 50% of the population in most top coal districts are multidimensionally poor, suffering from poor health, education, and living standards; this is twice India's average of 27.5% (Map 2). Additionally, districts with the dominance of coal mining, power plants, steel, cement, and refineries are critically polluted in terms of air, water, and soil pollution. Coal mining is also responsible for about half of all the forestland diverted for mining, affecting forest-based livelihoods, an important source of income for marginalised communities.[9]

Map 2: Distribution of multidimensional poverty

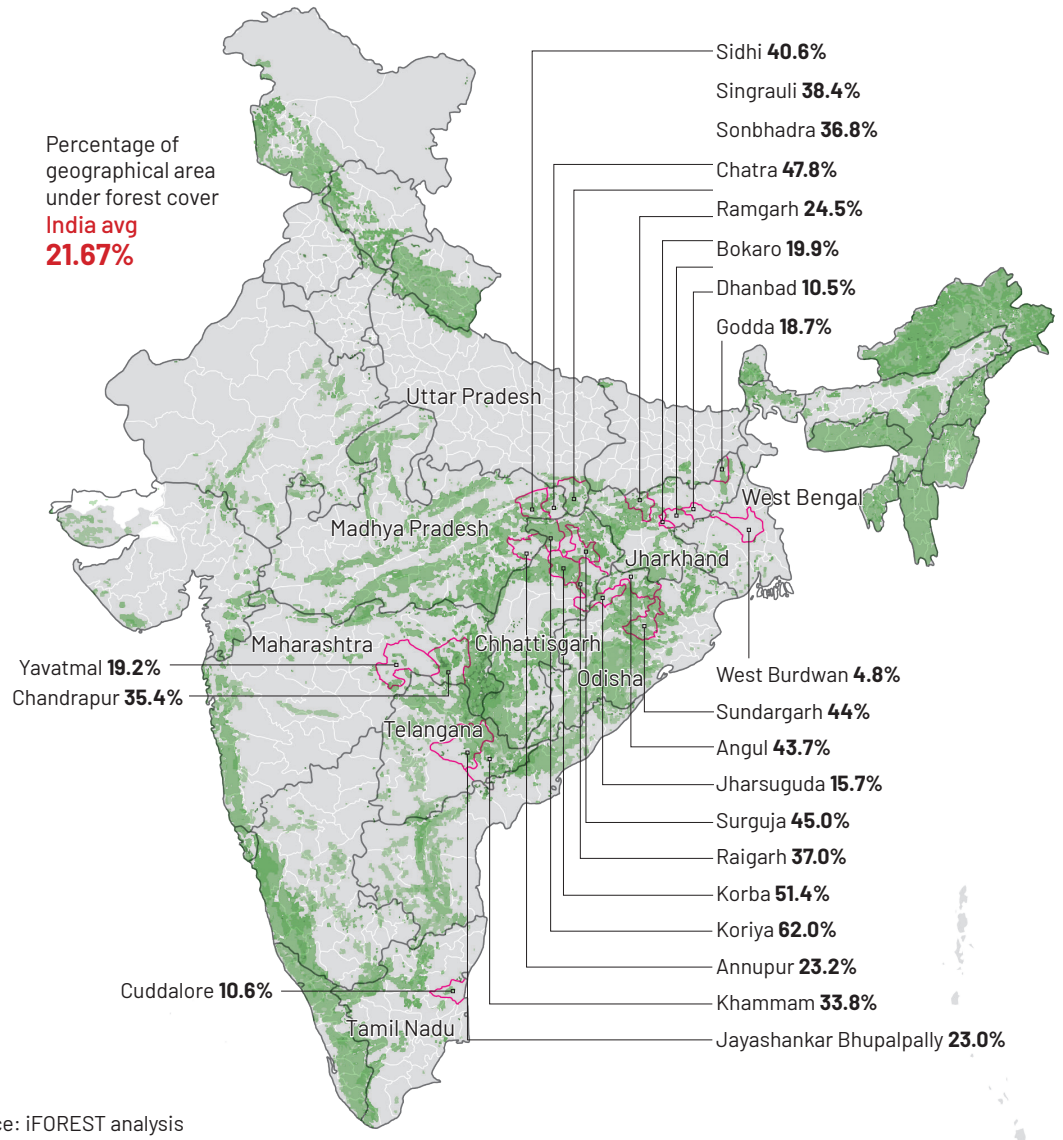


Source: iFOREST analysis; Data adopted from India country-level analysis of Oxford Poverty and Human Development Initiative.

But we have an opportunity to reverse this trend by adopting better social and environmental policies and practices. Just transition planning in the coming years allows us to develop a new 'environmental and social contract' between the people, the government, and the private sector. The new social contract must ensure inclusive decision-making, poverty alleviation, fairer income distribution, and investments in human development and social infrastructure. The new environmental contract should be about ecological protection and restoration, which will also contribute to the enhancement of sustainable livelihood and income opportunities.

There is already a huge untapped potential for this. For example, the average forest cover in coal mining districts is nearly double the country's average (Map 3). Similarly, there are huge tracts of agricultural land in these areas whose productivity can be improved through investments in irrigation and watershed management practices.[10]

Map 3: Forests cover in top coal districts



Source: iFOREST analysis

To conclude, just transition will be a strategic process that must be planned carefully and rolled out over the next few years. This should be done considering the opportunities for transition in various sectors, the geographies which are particularly vulnerable to the closure of operations and subsequent job loss, distribution of the workforce (formal and informal), and the overall resilience of the local communities and the regions dependent on fossil-fuel and allied sectors.

The assessment clearly shows that a transition by no means can happen in one go for all sectors, nor should it be planned in that manner. Therefore, a road map must be developed for the coming decades aligning with the emission reduction targets and considering the opportunities at hand to usher in a transformative change that is inclusive, just, and viable.

Annexure 1

Assessment of GHG emission reduction potential and technology readiness						
Sectors	Sub-sector	GHG emissions (% of India's total)	Main fuel/ emissions	Key technologies or best available options for emission reduction	Technology readiness for large-scale deployment	
					Years from present	Assessment
Mining, processing and storage	Coal	0.7	Fugitive CH4	Phased mine closure	0-30 years	Closure of non-profitable and UG mines over the next 10 years
	Oil and Gas	0.8	Fugitive CH4	Reduced flaring and methane capture, reduction in oil and gas extraction	1-2 years	Flaring reduction and methane capture economically viable and available
Thermal power	Coal	42	Coal/ CO_2	Renewables and storage	5 years	24x7 renewables outcompetes Coal power before 2030. Next 10 years crucial for battery storage and smart grid development. Solar and wind are already cost competitive[1]
	Gas	1.6	Natural gas/ CO_2	Renewables and storage	20 years	Scope to increase gas-based power for peaking if economically viable. Reduction can be planned after 2040
	Oil	0.3	Oil/CO_2	Renewables and storage	0	24x7 Renewables already cheaper than oil-based power
Transport	Trucks	4.4	Diesel/CO_2	Electric, biofuels and hydrogen	15 years	Biofuels already viable. Hydrogen and electric in 15 years[2]
	2-3 wheelers	2	Petrol/CO_2	Electric	0	Already viable. Massive scaling up projected in the next 10 years
	Passenger cars	2	Petrol and Diesel/ CO_2	Electric	3 years	In 2-3 years
	Other road transport	1.4	Petrol and Diesel/ CO_2	Electric	0	City buses already viable
	Civil aviation	0.6	ATF/CO_2	Electric- electrification of ground operations in aircraft (taxiing)	> 20	No clear timeframe for India
	Railways	0.3	Diesel/CO_2	Already highly electrified	0	100% electrification by 2023; Net zero carbon by 2035
	Navigation	0.1	Diesel and furnace oil/ CO_2	Electric, biofuels and hydrogen	10-15 years	Technology in process of development and demonstration

Sectors	Sub-sector	GHG emissions (% of India's total)	Main fuel/ emissions	Key technologies or best available options for emission reduction	Technology readiness for large-scale deployment	
					Years from present	Assessment
Industrial	Brick	0.4	Coal/ CO_2	Intermediate technologies like zig-zag, porous, perforated, hollow bricks/blocks, fly ash brick, AAC etc. are available and commercially viable. But clay bricks will have to be phased-out in the next two-three decades to meet climate and other ecological goals	20 years	Intermediate technologies already available, needs scaling up through market support. Clay bricks to be replaced with sustainable building materials in next 2-3 decades
	Refinery	2.8	Oil/CO_2	Improvements in efficiency and reduction in flaring	1-2 years	Cost competitive
	Iron and steel	5.4	Coal/ CO_2	Scrap-based electric arc furnaces (EAF), hydrogen-based direct reduced iron (DRI) facilities, iron ore electrolysis and ancillary equipment electrification	> 15 years	Hydrogen-based DRI & Iron ore electrolysis in 15 years
	Cement	6.3	Coal & process emissions/ CO_2	Alternative fuels and Supplementary Cementitious Materials (SCM)[3]	5 years	A 25% thermal substitution rate and 0.5 clinker: cement ratio is achievable by 2025-2030. Other technologies not in sight. CCUS consideration of long-term future
	Fertilizer	0.7	Gas/CO_2	Hydrogen to produce ammonia	15 years	Green ammonia production technology currently in process of development and demonstration[4]
	Other industries	8	Coal, oil & gas/ CO_2	Renewable based captive power plants, heat pumps, and electric, biofuels and hydrogen boilers and furnaces and high efficiency motors	5 years	In contrast to heavy industries, most of the technologies required for deep emission reductions in this sub-sector are available in the market and can be deployed in scale in the next 5 years.. This is in because more than 90% of total heat demand is low/medium temperature, which can be more readily and efficiently electrified
Residential		5	Oil, gas & biomass/ CO_2	Energy efficiency, super-efficient appliances and electric cooking	1-5 years	Technologies available at commercial scale. Can be mainstreamed in 1-5 years
Commercials/Institutional		3	Coal, Oil and gas/ CO_2	Energy efficiency, electric boilers and electrification (heat pumps)	5	Most of the technologies required for deep emission reductions in this sub-sector are available in the market and can be deployed in scale in the next 5 years
Agriculture	Agricultural soils (urea)	2.7	N_2O	Reduction of urea use through better agricultural practices is the easiest option. The use of bio-fertilizers (such as manure) is also important	Ongoing	This is available, only requires change in farming practices and policy push

Annexure 2

Potential job loss and reskilling scenarios from sectoral transitions

Sector	Activity	Production process-Labour intensity		Labour distribution	Indirect labour, Transportation	Key transition mechanism to reduce GHG emissions	Job loss vs reskilling scenario
		Mechanized	Manual				
Coal	Mining	Mechanization increasing over years in mining activities; reduction in formal and skilled labour	High dependence on manual labour in old coal regions for loading, unloading and various mining activities	Predominantly informal	Road (very significant, for major PSUs about 50% of production being transported by road) and rail	Phasing down of operations, including closures	Primarily job loss of informal workers and reskilling of skilled manpower
Crude oil	Extraction	Highly mechanized		Predominantly formal	Pipeline	No significant phase down	NA
Natural Gas	Extraction	Highly mechanized		Predominantly formal	Pipeline	No significant phase down	NA
Refining	Production of petroleum products	Highly mechanized		Predominantly formal	Road, pipeline and rail	Change in production process	Some job loss can be anticipated in refineries as refining activities reduces after 2 decades; reskilling and retraining also significant
	Marketing and distribution		Manual labour significant in retail centres and also LPG distribution	More informal		Repurposing of facilities retail facilities, phasing down of LPG distribution over time.	Primarily reskilling and retraining for marketing; for LPG distribution job loss
Coal-based thermal power	Production	Mechanized		Predominantly formal	Grid	Phasing down of operations, including closures	Job loss for unskilled and informal, reskilling of skilled
Steel	Production of iron and steel (including crude and finished)	Mechanized	Manual labour in loading, unloading, waste management etc.	Formal including contractual in main production process significant	Rail and road	Change in production process	Reskilling and retraining

Sector	Activity	Production process-Labour intensity		Labour distribution	Indirect labour, Transportation	Key transition mechanism to reduce GHG emissions	Job loss vs reskilling scenario
		Mechanized	Manual				
Cement	Production	Mechanized	Manual labour in loading, unloading, waste management etc.	Formal including contractual in main production process significant, however has implication for huge amount of employment in related manufacturing and construction sector	Rail and road	Change in production process	Reskilling and retraining
Fertilizer	Production and application on soil	Mechanized	Application in farms, labour intensive		Rail and road	Change in application and process	Reskilling and retraining

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