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GLOBAL COAL TRANSITIONS

PAST AND PRESENT

A Review of Policies, Processes and Politics

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EXECUTIVE SUMMARY

Coal transitions have been taking place for over a century driven by technological advancement and economic realities. Transitions of the past (Ruhr in Germany and the UK) were messy, complicated processes which often took decades to fructify. For example, the Ruhr region took 6 decades to manage the transition process, and even today unemployment in Northern Ruhr continues to be an issue. In the UK, this process began since 1920s and continues till today. A combination of factors including functional, political, and cognitive lock-ins delayed the transition process. In other words, factors like regional specialised supply chains catering to one industry, resistance from local communities and mining companies, collusion between local political representatives and companies catering to their voter base, state policies and subsidies that protected and aided uncompetitive businesses, lack of foresight on economic and financial decline, top-down and fractured decision-making processes, impeded the transition process. This resulted in widespread, decades-long unemployment, economic decline of these areas, outward migration, and feelings of betrayal and mistrust amongst impacted communities towards political representatives and processes. The unplanned nature of these transitions also meant that environment remediation and land reclamation of degraded coal sites lacked funding which impacted investments of new industries in the region.

Globally, countries have been using a 5-pronged approach under 'Just Transitions' to manage coal phaseouts



PRESENT TRANSITIONS

To avoid the fallouts of past transitions, countries today are pre-empting the coal transition process, driven by concerns on climate change. Another aspect which is different is the time required to make this transition happen. The first energy transition took well over a century to unfold (from 1800s till about 1920), and the second transition in many ways is still ongoing, given energy poverty continues to be prevalent in many parts of Africa and Asia (Wilson & Grubler, 2011). In comparison, the current transition to clean technologies needs to happen before or by 2050, if we are to limit global temperature rise to between 1.5°-2°C by the end of this century. To this end, countries, sub-national entities, and even corporations have been announcing target years by when they will stop unabated or non-integrated fossil fuel consumption. This necessitates a transition away from unabated coal usage, both as a fuel and feedstock, by the middle to latter half of this century.

Experience from past transitions has provided an incentive for the ongoing transitions to be inclusive of local stakeholders and plan economic regeneration via a multi-decadal regional industrial policy. Therefore, today's transition measures are being incorporated under the broad head of 'Just Transitions'. There is no one definition for the term. It encapsulates the concepts of context of climate justice (distribution of risks and responsibilities); energy justice (vulnerabilities in terms of access, affordability, and energy poverty in marginalised communities); and environment justice (restoration of past damages) The strategy largely focusses on:

- Replacing and stabilising revenue streams for workers, companies, and governments
- Planning, funding, and executing complete environmental remediation
- Economic development strategies appropriate to local context
- Participatory and transparent process during closure, remediation, and transition planning and support from state and federal entities
- Willingness to change and positive outlook with community resilience during transitions.

Keeping differences in political framework aside, globally countries have been preparing the transition roadmap using the following strategy:

DEFINING AFFECTED PARTIES:

- Defining coal workers, affected regions or communities.
- Multiplier factors which impact allied sectors and job profiles.
- Socio-economic profile including productive years, dependents, education, and other parameters.
- Codification of these definition through central or state level legislations and policies.

QUANTIFYING THE COST OF TRANSITION:

- Financial cost of shutting coal mines and power plants to be paid to mining and power companies.
- Economic impact of closure on the regional and local economy in terms of productivity losses, unemployment benefits, tax base erosion, estimated investment to generate similar value, and other region-specific issues.
- Cost of compensation packages, pensions, and reskilling/retraining workers to mitigate job losses.

- Reclamation of degraded mine lands, and overall environmental remediation of rivers etc in the region.
- These are translated as estimated costs discounted over the next 30-40 years to bring about economic regeneration.
- Creating short, medium, and long-term budgets for the transition process with periodic revisions based on evaluation studies.

IDENTIFYING FUNDING SOURCES:

- Identifying and repurposing existing allocations from schemes from different ministries and agencies at all levels of the government
- Setting up and allocating increased funding to affected zones under the broad classification of Just Transition Fund
- Leveraging climate finance to support just transition activities through multilateral public finance institutions (eg. 450 public development banks signed a joint declaration on funding transition activities that foster social investment, inclusion, and equality.
- Leveraging global institutional capital supporting green finance instruments.

MAPPING A GOVERNANCE STRUCTURE:

- Creating commissions or agencies at different levels to oversee the transition process
- Coal Commission/Just Transition Commission under a particular ministry to assess the social, economic, and financial impact and sometimes coordinate the transition process at the national level
- They include representatives from all impacted stakeholders including local and regional governments, local businesses, coal miners and workers, coal unions, community leaders, local councils etc.
- Creating a new authority or empowering an existing authority at the regional/ state level bodies with independent members, local representatives and experts, to facilitate social dialogue, provide inputs to the transition roadmap and implement it.
- Separate subgroups and technical working groups at the district level to provide localised inputs on the new investment ideas
- Timelines for periodic evaluation of the transition roadmap

SOCIAL DIALOGUE AND COALITIONS:

- Necessary to sensitise workers and communities about ongoing or impending job losses, mitigate feelings of mistrust and abandonment, and facilitate bottom-up decision making.
- Key stakeholders include coal communities, trade unions, civil society, and business representatives. Creating local forums including workshops, focussed group discussions, surveys etc. to ideate on regional and local transition strategy.
- Including local representatives in the local or regional councils/implementing agencies

The current transition to clean technologies needs to happen before or by 2050, if we are to limit global temperature rise to between 1.5° - 2°C by the end of this century.

FIGURE 1:
A Just Transition strategy roadmap

Source: Compiled by author

Who will be impacted?

- Defining coal workers, affected regions or communities.
- Assessing multiplier factors including allied sectors; job profiles; socio-economic profile
- Codification of these definition through central or state level legislations and policies.

What will be the impact?

- Evaluating financial and economic costs of transition - local, state, and national tax base erosion, job losses, productivity losses, environment remediation
- Costs of compensation packages, retraining and reskilling workers, grandfathering of assets

How to fund the transition

- Repurposing existing allocations from schemes at all levels of the government
- Setting up Just Transition funds and increased allocations
- Leveraging climate finance to support just transition activities through multilateral public finance institutions; global institutional capital supporting green finance instruments.

How to govern the transition?

- Commissions under a particular ministry to assess the social, economic, and financial impact
- Creating a new authority or empowering an existing authority at the regional /state level with independent members, local representatives and experts
- Separate subgroups and technical working groups at the district level to provide localised inputs on the new investment ideas

Bottom-up consensus building

- Key stakeholders include coal communities, trade unions, civil society, and business representatives
- Facilitating local forums including workshops, focussed group discussions, surveys etc. to ideate on regional and local transition strategy
- Including local representatives in the local or regional councils/ implementing agencies

LONG-TERM ROADMAP

The end goal of the transition process is to create a strategy that leads to economic regeneration of coal mining areas. Examples from global coal transitions as well as other transition literature (EBRD, 2020) prove that re-inventing a region based on its inherited capabilities, i.e., existing knowledge, skills and institutions helps in successful development of new industries. These ideas have been integrated within the ‘Smart Specialisation’ strategy developed by the European Union since 2009 and have been the central condition to access regional funds since 2014. This strategy has been applied to over 150 regions in Europe and the Latrobe valley in Australia. It avoids the pitfalls of one-size-fits-all solution making, by following a place and evidence-based approach to allocating resources and creating capacity for new specialities based on underlying strength and potential of the region which helps bring about structural changes (Wiseman, Workman, Fastenrath, & Jotzo, 2020). The Ruhr region is a prime example of this strategy where the authorities harnessed the natural latent talent in the field of energy efficiency, renewable and environmental technologies – which had been used to serve the coal and steel industries – to become one of the key centres for these industries. Gippsland in the Latrobe Valley followed a similar path to identify four new industries for exploration - Food and Fibre, New Energy, the Visitor Economy, and Health and Wellbeing (Wiseman, Workman, Fastenrath, & Jotzo, 2020). In isolated regions (Head of the Valleys in South Wales) where it has been difficult to manage to attract new investments, countries have adopted a ‘managed retreat’ which has seen resulted in outward migration and relocation.

EMERGING ECONOMIES PERSPECTIVE

Ongoing research on just transition shows that one of the biggest challenges in translating the approaches from developed countries to emerging economies is the high incidence of the informal economy. Most countries do not have accurate estimates of the number of informal workers involved in mining. To share a few examples, in South Africa, these are called 'zama zamas' or those who try and try in the Zulu language. Often, they are miners who have been left jobless after the mining companies moved on. In the local context these artisanal miners have been mining in abandoned mines for a while, and their activities are not seen as illegal (Ermelo, 2021). In Columbia, about 17 per cent of the medium coal mines and 50 per cent of the small scale producers in the inner regions don't have legal mining rights and yet about 70 per cent of the coal they produce is used for domestic consumption. There are no estimates on the number of informal workers in these mines (Błachowicz, et al., 2017). In India, 81 per cent of the labour force is employed in the informal sector/ shadow economy (with no social benefits) and if one were to include the portion of informal sector workers (contract/casual labourers), then the proportion is as high as 92 per cent (Punia, 2020). Estimates suggest that the size of the formal coal economy is about 7 million (Pai & Zerriffi, 2021) and the informal coal economy is about 2.5 million people (Lahiri-Dutt, 2016).

Translating ongoing approaches on compensation and voluntary retirements for workers; retraining and reskilling programmes, and economic regeneration implies having institutional support, something which informal coal workers without job or social security are likely to miss out on. Further, the reason for the persistence of the informal economy is quality of labour in terms of education and skill levels. A study by the International Labour Organisation found that 30 per cent of the labour force is illiterate, 52 per cent are educated up to secondary level (although 40 per cent of this have less than 8 years of education), 7.2 per cent have general academic training but only 3 per cent have technical education at the tertiary level (Mehrotra, 2019). These characteristics imply that it is necessary to create a socio-economic job profile of the labour before undertaking retraining or reskilling programmes in developing countries to transition to better quality cleaner jobs (as is being done in South Africa). Ongoing research by the authors of this brief and others (Błachowicz, et al (2017), TERI (2021), iForest, (2021), Pai (2021), Chandra (2018)) suggests that developing countries therefore need to re-imagine the just transition process and make it localised and context specific.

The just transition process from South Africa forms a useful template for developing countries to prepare their own Just Transition strategy suited to localised context. South Africa is one of the rare examples which has seen a convergence between trade unions, civil society, and governments when it comes to the conversation on just transitions. The transition dialogues have been ongoing for more than a decade now. The conversation around just transition was initiated by trade unions (COSATU) since 2009 and found support from civil society and government quarters. The government on its part initiated a facilitative, collaborative, and transparent process since 2012 using different mechanisms. It initiated the social sector dialogues with labour unions, civil society, government representatives and other experts to ideate on a just transition strategy. Simultaneously, it is also backing the just transition process with evidence-based research through the National Employment Vulnerability Assessment, and the sector-specific jobs resilience reports. A vulnerability analysis under the National Employment Vulnerability Assessment of the economic (gross value added by coal in comparison to other activities) financial (number of people employed in coal versus other industries) and social (education, gender, and skill profile) parameters of coal provinces found that four municipalities in the Mpumalanga province – eMalahleni, Steve Tshwete, Msukaligwa and Govan Mbeki – were highly

A study by the ILO found that 30 per cent of the labour force is illiterate, 52 per cent are educated up to secondary level, 7.2 per cent have general academic training but only 3 per cent have technical education at the tertiary level



81%

of the labour force is employed in the informal sector



vulnerable. This was a result of undiversified local economy heavily reliant on coal mining and power generation as well as financial resources, relatively low skills, and limited mobility in the labour market (Makgetla, Maseko, Montmasson-Clair, & Patel, 2019). Parallely, the sector jobs resilience plans for the coal sector value chain (Trade & Industrial Policy Strategies, 2020) which drew inputs from the vulnerability report recommended:

- Establishing national and regional SRJP offices to collaborate with municipalities, provincial government, and stakeholders in the coal value chain.
- Revising Social and Labour Plans – introduced in 2002 to address social conflicts associated with mining and support local economic development – to act as a driver for local economic diversification after mining closure
- Diversification of local economy with assessing job creation potential of mine rehabilitation to create areas for recreation and farming, generating renewable energy, and the circular economy around coal waste
- Identifying skills and needs of vulnerable workers to develop active labour policies

These reports along with the social sector dialogues formed the basis of creating a national authority (the Presidential Climate Commission) to coordinate and oversee the just transition process along with plans on state level SJRP offices to coordinate with local authorities. To be fair, there are several challenges including finding the money to fund the just transition process, overruling vested interests, inclusion of informal workers, and providing employment in a country which has been suffering from a severe unemployment crisis since 2010. However, the open, inclusive, and transparent just transition process provides a useful template for developing countries to begin their own transition processes.

The intent of this note was to provide a knowledge framework for Indian policy makers, companies, civil society, and researchers on coal transitions underway in other countries. It is obvious that India cannot directly adopt the processes being undertaken in Europe and the US, given the political economy of coal in the country. In India, there may be no single ‘decision’ to phase coal out, and even if some such public commitment is made, it will mostly lag the beginning of the actual phase-out transition - as is indeed already happening. This makes it important to begin planning for such a transition even without a formal decision on coal phase-out if we are to avoid the fallout of an unplanned transition as seen in Ruhr, UK and several other parts of Europe. Although here as well, India differs, given these countries and regions were facing deindustrialisation and India needs to remain on the growth path to fulfil her development goals. Thirdly, the cultural diversity and difference in social and economic indicators, sometimes even between different districts, complicates India’s transition pathway. Therefore, while global debates can afford pointers on approaches, India will have to chart its own ‘just transition’ pathway.

INTRODUCTION

Transitions of energy systems are not new. Historically, two major transitions impacted our energy systems – the advent of steam-powered coal which helped ease constraints of pre-industrial energy systems and displacement of coal technology by electricity and petroleum-based technologies. These disruptions altered the global political, economic, social, and cultural landscape.

Today, we are in the midst of a third transition as the globe moves from fossil-fuel based energy systems to centralised and de-centralised energy systems powered by clean technologies. Many aspects set this transition apart from previous ones. For one, it is not being driven purely by the economics and efficiency argument. While both these perspectives play a role, climate change is the main driver of this transition. Another aspect which is different is the time required to make this transition happen. The first energy transition took well over a century to unfold (from 1800s till about 1920), and the second transition in many ways is still ongoing, giving energy poverty continues to be prevalent in many parts of Africa and Asia (Wilson & Grubler, 2011). In comparison, the current transition to clean technologies needs to happen before or by 2050, if we are to limit global temperature rise to between 1.5^o-2^oC by the end of this century. To this end, countries, sub-national entities, and even corporations have been announcing target years by when they will stop unabated or non-integrated fossil fuel consumption. This necessitates a transition away from unabated coal usage, both as a fuel and feedstock, by the middle to latter half of this century.

While energy transitions are not new, that does not make them any less easy or painful. Previous transitions have often led to economic, political, environmental, social, and cultural upheaval and resulting inequities at the individual, community, regional and national level. It has had long-ranging, long-standing implications for the productivity and value creation in the local and regional economy, on the structure and nature of the labour market, funding for social benefits like education and health, and on institutional, economic, and political structures (Campbell & Coenen, 2017), (Fothergill, Coal Transition in the United Kingdom, 2017), (Oei, Brauers, & Herpich, Lessons from Germany's hard coal mining phase-out policies and transition from 1950 to 2018, 2019).

To mitigate this fallout, countries and regions are formulating plans under the broad banner of 'Just Transitions'. The purpose of this paper is to summarise select past and ongoing discussions and processes on 'just transitions' in developing and developed countries and provide a knowledge framework for Indian policy makers, companies, civil society, and researchers on coal transitions underway in other countries.

NET ZERO ANNOUNCEMENTS BY COUNTRIES

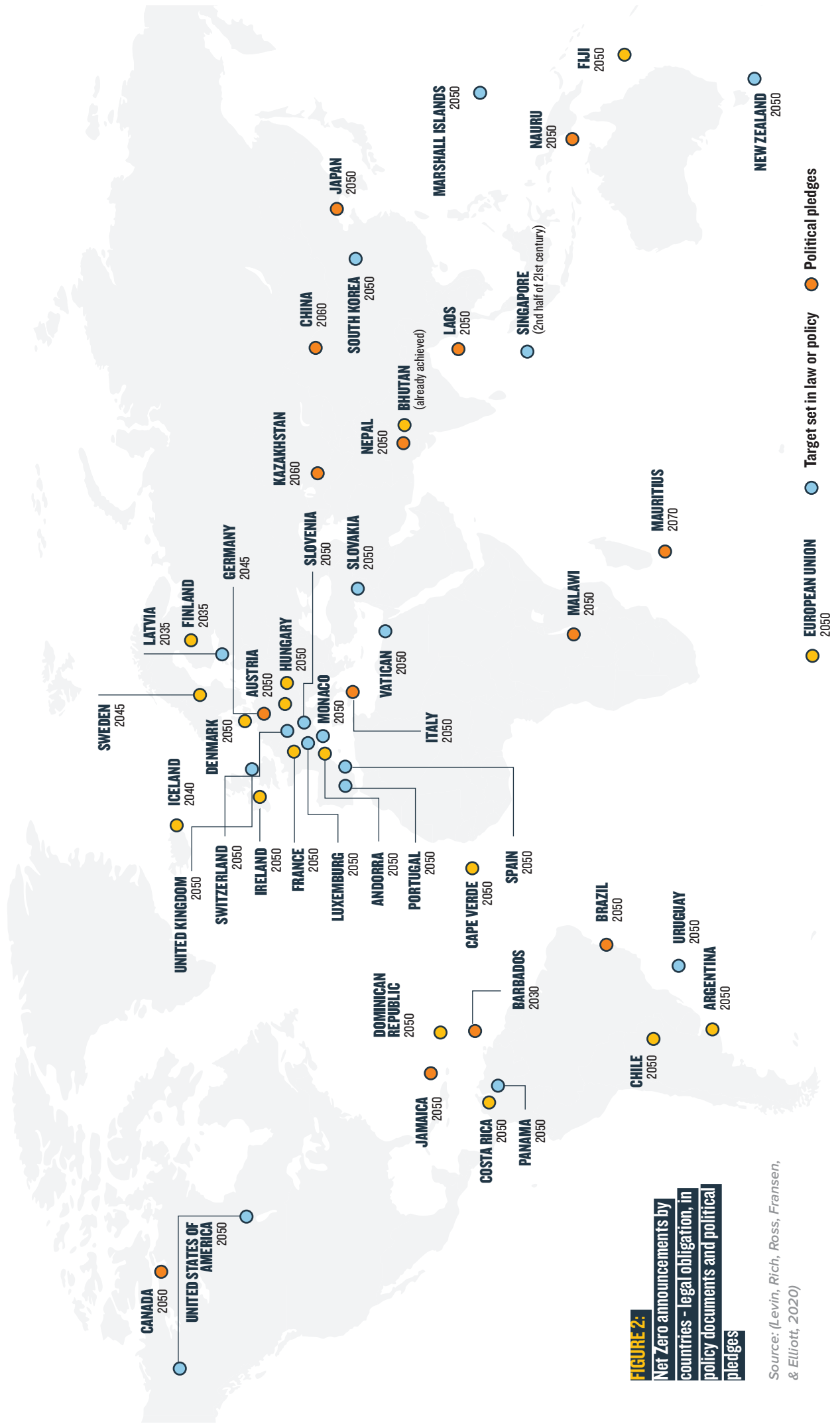


FIGURE 2: Net Zero announcements by countries - legal obligation, in policy documents and political pledges

Source: (Levin, Rich, Ross, Fransen, & Elliott, 2020)



MAKING COAL TRANSITIONS 'JUST'

The concept of 'Just Transitions' has its origins in the United States labour movement in the 1970s and 1980s, when Tony Mazzochi proposed a 'superfund for workers' who were at risk of losing their jobs due to the peacetime economy in post-war US, and a wave of environment protection policies. (Cahill & Allen, 2020). Historically, the concept has been used by labour unions to influence the distribution of benefits and harm within the existing energy system (fossil fuels) which has been characterised by the triumvirate of power, politics, and political economy. In such a system, union workers have sought just distribution, recognition, and participation. However, as Healy and Barry (2017) argue job creation is a poor proxy for just transition – what matters more is the kinds of jobs, how secure they are, how long they last, and related forms of community resilience and innovation in the face of dynamic energy markets as highlighted by the 'Solidarity and Just Transition Silesia Declaration' issued at the 2018 Katowice Climate Conference (UNFCCC, 2018). This is particularly relevant in the Indian context given the nature of our economy with a significant share of the work done in the informal market, without social and institutional security. But this still restricts the concept of just transitions particularly in the context of climate justice – distribution of risks and responsibilities –, energy justice – vulnerabilities in terms of access, affordability, and energy poverty in marginalised communities, – and environment justice – restoration of past damages. McCauley and Heffron (2018) propose reframing the definition of just transition to subsume all these concepts. This paper follows this concept of just transitions since it is particularly relevant from a coal transition perspective.

Coal regions and economies across the world are some of the oldest industrial regions. In historical terms, these regions were centres of rural hinterland providing administrative, trade, military, or other functions. Commercialised mining changed the structure, demography, and traditional character of these mid-sized or small towns, as in-migration of labour (mostly men) led to housing development typically near mines or factories. Industrialisation developed on the basis of mining along with transport linkages. These towns and regions were often the first to be connected to new modes of transport. But mining also changed the landscape and natural environment leading to pollution and displacement of the original communities.

At the risk of generalisation, these regions are industrial mono-structures with overspecialisation in mature industries. This has ensured extensive and specialised knowledge infrastructure, a labour force with specific skillsets, and local political support for the industry. The existence of mono-structures also means that these industries are high net value creators for the local and regional economy. Moreover, they are also key sources of revenue for local, state, and central or federal governments to fund social welfare programmes and subsidise citizens. Some examples of this are:

- Energy and other minerals accounted for 52 per cent of the state revenue (\$2.2 billion) for Wyoming in 2017 (Handler, Henry, & Bazilian, 2020).
- In Colorado, the state's coal-fired power plants and coal mines paid an estimated USD 65 million in property taxes in 2019. When these coal facilities close, it would take nearly USD 2.75 billion in new commercial property value to generate the same value (Colorado Department of Labour and Employment, 2020).
- In Germany, the lignite industry in the Lausitz mining area achieved a gross added value of slightly more than €1.2 billion in 2016 i.e., around 4.3 per cent of the total added value in the region. The lignite company LEAG states that it creates an annual added value of about €1.4 billion in the Lausitz mining area (Commission on Growth, Structural Change and Employment, 2019). With coal phaseouts being discussed, the German region of Lusatia, being the country's second biggest coal producer, has an unemployment rate twice as high as the national average.
- In Polish Silesia, youth unemployment is a striking 39%.
- Greek Western Macedonia, where most of the jobs are in coal mining and electricity production sectors, rates first among all European regions with highest unemployment in 2017, with its 29% rate across all ages (Oczkowska & Pellerin-Carlin, 2019)

Despite creating value, the mono-structure in these regions leads to the inherent problem of 'resource curse', particularly in less developed and developing countries. A European Commission (EC) study of 35 regions with coal mines and power plants in Europe found that on average, regions with coal power plants are the regions with lower economic power compared to the country average than regions without any of these facilities (Alves Dias, et al., 2018). In India, despite being a coal and mineral-rich state, Jharkhand scores second lowest and abysmally low as per the SDG index on poverty; zero hunger; quality education; gender equality; responsible consumption and production; and climate action (Chadha, Kapoor, & Sivamani, 2021). Moreover, given the extractive nature of the regions, investment in connectivity and digital infrastructure tends to be linked to the production and consumption centric areas, often leaving other parts of the region underdeveloped. And lastly, these regions tend to be epicentres of environmental pollution – air, water, soil – no matter how stringent the emission norms in the country may be.



Despite being a coal and mineral-rich state, Jharkhand scores second lowest and abysmally low as per the SDG index on poverty; zero hunger; quality education; gender equality; responsible consumption and production; and climate action

To contextualise Grabher (1993) and Campbell and Coenen (2017), the factors which in the past led to the success of these regions, may in the future hamper innovation since they suffer from three main lock-ins:

- **Functional lock-in:** Overly strong and hierarchical inter-firm networks that can block development of alternative linkages and reorientations in the value chain.
- **Cognitive lock-in:** Presence of a common mindset amongst regional and local stakeholders that restricts imagination for development of new ideas and reinforces group-think.
- **Political lock-in:** The dependency of political structures on existing industries and infrastructure that hampers alternative directions for industrial development.

These factors played a significant role in delaying the transition in the Ruhr region and in the UK. Today, in order to mitigate these conditions, 'Just Transition' plans account for several components. Globally, as detailed by Haggerty, Haggerty, Roemer, and Rose (2018), the transition strategy focusses on:

- Replacing and stabilising revenue streams
- Planning, funding, and executing complete environmental remediation.
- Economic development strategies appropriate to local context.
- Participatory and transparent process during closure, remediation, and transition planning and support from state and federal entities.
- Willingness to change and positive outlook with community resilience during transitions.

A review of past and ongoing transition policies highlight that these approaches have been /are being incorporated in legislations/development programmes in key coal mining regions. Based on the typology created by Spencer, et al. (2017), the approaches can be divided into worker, regions/community, and business initiatives:

FIGURE 3:
Approaches for coal transition plans across different countries

Source: Based on typology by (Spencer, et al., 2017) and information from (Colorado Department of Labour and Employment, 2020), (Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization, 2021), (BMW, 2019), (European Commission, 2020), (Widuto, 2019) and (European Commission, 2021)

Strategic approaches to transition policies in coal regions around the world		
Worker	Regions/Communities	Mining or Other Corporations / Businesses
Compensation or redundancy programmes	Economic regeneration activities via policies to diversify the region and broaden the tax base.	Financial compensation or grandfathering
Shifting workers to allied industries requiring similar skill sets	Land reclamation and conservation policies	Tax incentives to encourage entrepreneurship
Reskilling programmes	Investment in green energy, connectivity, and digitisation infrastructure	Policies to expand existing local businesses and specialities
Enhancing social security cover	Creating/investing in local leadership	
	Development of infrastructure to make the regions more attractive for investors.	
Dedicated capital for transition via a regional investment entity/new fund		

To implement the coal transition strategy, countries are basing their strategy as follows:

- **Who are the affected parties?** This includes defining coal workers, affected regions or communities, and includes multiplier factors which impact allied sectors and job profiles. It also includes socio-economic profiling of affected workers including productive years, dependents, education, and other parameters. Once identified, these are being codified through central or state level legislations and policies. This exercise also includes evaluation of region-specific issues and specialisation skills which can foster economic regeneration.
- **How much will the transition cost?** Governments at the local, state, and federal levels are quantifying the financial cost of shutting coal mines and power plants to be paid to mining and power companies; economic impact of closure on the

In some cases, governments have set up a Just Transition Fund or increased allocations which will be made for the transition process



regional and local economy in terms of productivity losses, unemployment benefits, tax base erosion, estimated investment to generate similar value, and other region-specific issues; cost of compensation packages, pensions, relocations, and reskilling/retraining workers; costs of reclaiming degraded mine lands, and overall environmental remediation of rivers etc in the region. These are translated as estimated costs discounted over the next 30 years that governments/private sector investments will have to pump into the affected regions to bring about economic regeneration. The plan also involves creating short, medium, and long-term budgets for the transition process with periodic revisions based on evaluation studies.

- **How to fund the transition?** Funding the transition is the most challenging part of the transition strategy. This is because over 90 per cent of climate finance flows toward net-zero investments in renewable energy. The first step being taken is identifying and repurposing existing schemes from different ministries and agencies at all levels that can be used for investing in affected regions for workers and communities. In some cases, governments have set up a Just Transition Fund or increased allocations which will be made for the transition process. Simultaneously, it is necessary to leverage climate finance to support just transition activities. Currently climate finance is not tied to just transition activities and it is becoming increasingly clear that without integrating social dimensions of the energy transition plan, financing just transitions will be difficult. Conversation around this is building in the global finance community with 450 public development banks having signed a joint declaration on funding transition activities that foster social investment, inclusion, and equality (Finance in Common, 2020). Another avenue is leveraging global institutional capital supporting green finance instruments.
- **How to govern the transition?** To avoid repeating mistakes of the past, many countries and regions are creating commissions or agencies at different levels to oversee the transition process. At the national level, many countries and regions have set up a Coal Commission/Just Transition Commission to assess the social, economic, and financial impact. These commissions include representatives from all impacted stakeholders like local and regional governments, local businesses, coal miners and workers, coal unions, community leaders, local councils etc. At the regional/state level, governments are creating new authorities or empowering existing ones to facilitate social dialogue, provide inputs to the transition roadmap and implement it. Further, separate subgroups and technical working groups are being created at the district level to facilitate bottom-up inputs to the transition and regional industrial strategy.
- **How to build bottom-up consensus?** This step is necessary to sensitise workers and communities about ongoing or impending job losses, mitigate the mistrust and sense of abandonment and facilitate bottom-up decision making. Therefore, to make the transition process more inclusive, the national commissions include representatives from the impacted area. Their inputs are sought through the roadmap process. Further, during the monitoring and implementation stage, these representatives are included in the local or regional councils/agencies to seek their feedback during periodic evaluation and also allow them to own the transition process to an extent.

FIGURE 4:
Planning a Just Transition Strategy

Source: Compiled by author

Who will be impacted?

- Defining coal workers, affected regions or communities.
- Assessing multiplier factors including allied sectors; job profiles; socio-economic profile
- Codification of these definition through central or state level legislations and policies.

What will be the impact?

- Evaluating financial and economic costs of transition - local, state, and national tax base erosion, job losses, productivity losses, environment remediation
- Costs of compensation packages, retraining and reskilling workers, grandfathering of assets

How to fund the transition

- Repurposing existing allocations from schemes at all levels of the government
- Setting up Just Transition funds and increased allocations
- Leveraging climate finance to support just transition activities through multilateral public finance institutions; global institutional capital supporting green finance instruments.

How to govern the transition?

- Commissions under a particular ministry to assess the social, economic, and financial impact
- Creating a new authority or empowering an existing authority at the regional /state level with independent members, local representatives and experts
- Separate subgroups and technical working groups at the district level to provide localised inputs on the new investment ideas

Bottom-up consensus building

- Key stakeholders include coal communities, trade unions, civil society, and business representatives
- Facilitating local forums including workshops, focussed group discussions, surveys etc. to ideate on regional and local transition strategy
- Including local representatives in the local or regional councils/ implementing agencies

PAST TRANSITIONS AND THEIR IMPACT

Past coal transitions have been driven by economic factors and less due to climate or environment policies (Caldecott, Sartor, & Spencer, 2017). Therefore, the strategies employed to mitigate the economic, financial, and social impacts were reactive rather than proactive. The impact of these transitions was more widespread since the number of people employed in coal in these regions was much larger, and coal was still had a bigger role in the energy mix of these countries, as compared to today. The coal transition in the Ruhr and Saarland region in Germany in the 1960s impacted 6,65,000 direct coal sector jobs (Oei, Brauers, & Herpich, Lessons from Germany's hard coal mining phase-out policies and transition from 1950 to 2018, 2019). In the UK, while coal mine closures began by the 1920s and exports stopped by the middle of the 20th century, the economy still employed 6,07,000 people in coal mining (Fothergill, 2017). Moreover, the reactive nature of the transitions had long-standing impact on the productivity of the region. Coal assets in many of these countries were still owned by the government, and therefore the political and cognitive lock-in reflects similarities to coal assets in India.

RUHR REGION, GERMANY

The Ruhr region in Germany is considered a textbook case study on coal transition and its impact. At its peak in 1958 the region was producing about 124 Million Tonnes (MT) of coal, employing a little more than 6,00,000 people. With a population of about 5.5 million in the 1950s, one in every 10 people here were employed in the mining industry (Dahlbeck & Gärtner, 2019). Following deregulation of coal prices in 1958, domestic coal had to compete with cheaper imported coal and oil which was used as a substitute in the heating sector. This meant that in a decade, employment in hard coal came down by half, and in two decades it was about one third of figures in 1957 (Oei, Brauer, & Herpich, 2019). The political and cognitive lock in the region resulted in a period of re-industrialisation as several policy measures were announced to protect the coal and steel industry. These included core industry cooperation, increased linkages producers and consumers, consolidation via mergers, tax subsidies for the steel industry to use domestic coal, financial resources for social measures if layoffs were necessary, a special consumer tax from 1974 till 1994 on electricity subsidised sales of domestic coal (coal penny). Along with these measures, policy support and investment was directed at strengthening and building regional infrastructure and establishing new universities (as a process to convert physical skills to knowledge-skills) (Dahlbeck & Gärtner, 2019), (Coenen, Wiseman, & Campbell, 2018). Former miners were transitioned to the metal industry and were also given options on early retirement and retraining. As documented by Oei et al. (2019), while this kept the unemployment in coal and steel industries low, upstream, and downstream sectors were not covered and unemployment there exceeded 15 per cent. Despite these measures coal continued to be uncompetitive. This led to a structural policy change from the middle of 1960.

This first structural policy focussed on social reduction of employment in coal mining, expanding recreational facilities, education, and research centres (demand side initiatives). The oil crisis of 1975-77 briefly led to hopes that demand for coal would increase, and the state government promoted technology programmes in mining, energy, steel, and economy which included upgrading old industrial areas via infrastructure development, urban renewal technology promotion etc (supply side initiatives). Simultaneously the state development company was tasked with developing abandoned land and mines and make it available for new businesses. These initiatives still did not yield expected returns. From 1980s the state government shifted its approach and developed a programme for 'sunrise technologies' with a focus on environmental and renewable energy technologies. Given the waste produced by coal and steel plants in the region and the energy that used to be consumed in these industries, Ruhr had natural latent talent in the field of energy efficiency, renewable and environmental technologies, which had been used to serve the coal and steel industries. These were harnessed via investments allowing Ruhr to become one of the key centres for these industries. Simultaneously, the old coal sites have been converted into heritage buildings and museum. The Emscher River International Exhibition (IBA) between 1989 and 1999 is mentioned in all literature sources on the Ruhr region as a landmark initiative that converted the wastewater, open sewer-ridden river and the vacant factories and abandoned coal mines surrounding it into a new site for housing, industries and monuments and ecologically regenerated the river. However, it did not result in direct job creation which had been lost from traditional industries and the region remains well above national average in terms of unemployment (Coenen, Wiseman, & Campbell, 2018).

The state government has been central to the process of regeneration of the Ruhr region, but the later strategies which delivered results witnessed a bottom-up approach of design and implementation by the local groups and communities.

In the 21st century, the average subsidy for a coal worker in Germany was €50,000





To boost depressed areas – places where coal mines had been shut down – the UK put in place several regional policies as far back as 1920s, when it became apparent that certain industries were losing their competitiveness, leading to unemployment, and needed to be supplemented via intra-region and inter-region linkages.

Despite all these initiatives, structurally, there are inherent differences in the region. Southern Ruhr which transitioned earlier from coal is better placed (as it transitioned to a knowledge economy) than northern Ruhr which transitioned later and is still home to coal and steel pensioners. Northern Ruhr still has above national average unemployment rate, higher poverty and higher percentages of people receiving social benefits (Dahlbeck & Gärtner, 2019). German subsidies to the coal sector have been extremely generous and included subsidising coal production for sixty years. In the 21st century, the average subsidy for a coal worker was €50,000. This support is unconceivable for any country which is not very rich. The last coal mine closed in Ruhr in 2018, but even after 60 years, the region is facing the after-effects of the coal transition process.

UNITED KINGDOM

The UK is considered the earliest example of a coal transition region since the decline here began before other countries in Europe. Consequently, the impact of a coal decline and policies for economic regeneration can be better understood from the UK transition. The story of the collapse of coal in the UK is the story of the country's economic and political history. Coal in the UK had peaked in 1913, when 1.1 million people were directly employed in the sector. Subsequently, external pressures (the depression decades of 1920s and 1930s, the dismantling of the British Empire which were key export markets, increased competition from Asia and Russia), coupled with legislations like the 1956 Clean Air Act, the discovery of gas in the North Sea, changing global landscape and technologies (e.g. decline in coal use in railways), recession in the 1970s and 1980s led to a structural shift in the economy from manufacturing to a service-led economy resulted in the collapse of the coal industry. Further, the path dependency created in the coal regions of Midlands, North Scotland, and Wales, which were also the heart of British manufacturing or the 'Old Industrial Regions' (OIRs) impacted iron and steel, railways, ship-building, and textile industries as well, resulting in a decline of the manufacturing sector in UK. At its peak in 1966, the manufacturing sector employed 8.9 million people, accounting for 30 per cent of all employment (Beatty & Fothergill, 2020) of which 6,07,000, were direct coal jobs (Fothergill, 2017). Today, about 2.7 million people are employed in manufacturing (7.7 per cent of the employed workforce) with about 6000 employed in the coal power industry.

The UK experimented with multiple approaches in the OIRs or depressed areas. But these approaches were more reactive than proactive, lacking consistency of implementation, and not a cohesive 'strategy' (Hudson, 2005), (Merrill & Kitson, 2017), (Swinney & Thomas, 2015), (Fothergill, 2008) (Fothergill, 2017). As such, the results they have generated varied results, especially amongst the different regions.

Economic regeneration: To boost depressed areas – places where coal mines had been shut down – the UK put in place several regional policies as far back as 1920s, when it became apparent that certain industries were losing their competitiveness, leading to unemployment, and needed to be supplemented via intra-region and inter-region linkages. The Mining Industry Act issued in the 1920s included provisions to support mining communities. Coupled with nationalisation of coal, shipbuilding, railways, steel industries (all of which were later privatised) in the aftermath of the second world war, the regional policies tried to shape economic transition via attracting new investment, creating 'New Towns and investing in public infrastructure. But strengthening intra-region linkages promoted cognitive and functional lock-ins, meaning they strengthened the path dependencies of these regions on the existing coal economy. Even when new industries were attracted, say call centres jobs in north-east England, they tended to be low-skill and low-value. By the 1970s, the government realised that these plans were not working, put on hold regional policies

being dictated by central government, and rationalised the nationalised industries. Simultaneously, they also created regional development agencies, like the Welsh Development Agency, and tasked them with economic regeneration. The degree to which these agencies were successful is debatable. While on one hand they succeeded in bringing investments into the region, these were centred around urban areas, and did not benefit the peripheries where the coal community was based (Merrill & Kitson, 2017) (Swinney & Thomas, 2015). Over time these agencies began using local inputs on their investment and implementation strategies (Hudson, 2005).

Apart from this, other assistance included the EU structural fund, Coalfields Regeneration Trust, and other aid programmes. Geography played a significant role on how the aid programmes worked. They worked to an extent in areas near centres which could diversify into other economic activity such as education — Warwickshire where in 25 years, 66 per cent of the job shortfall had been eliminated. In others like Head of the Valleys in South Wales which was in a remote location, even after 25 years and three rounds of EU structural aid, only 35 per cent of the shortfall had been eliminated (Fothergill, 2008). In many places, as in the US, abandoned coal mines were restructured and used to build prisons which may have provided a short term boost but was also the best of the worst options available to disadvantaged communities (Jones, Gray, & Farrall, 2021)

Coal workers and communities have been provided with redundancy payments unemployment benefits, incapacity benefits, retraining programmes etc since the 1920s through different policies. The presence of a strong labour union which championed the rights of the coal worker aided the process of financial compensation to the workers. This softened the blow in the short term, but the UK had been suffering from a job market shortfall long before the 1980s. The ‘depressed areas’ meant that even when a coal miner would get another job, it would be at the expense of someone else, i.e., unemployment would inevitably be transferred. Further, these jobs tended to be low-pay, low-skill jobs with little to no security. Beatty and Fothergill (2020) also found that in most places where the mines had previously closed, those seeking unemployment benefits were no higher than when the mines had been working. However, those seeking incapacity benefits (with health problems or disabilities who would nevertheless work in a fully employed economy) was much higher (8-11 per cent) than the national average of 6 per cent. This meant that the main consequence of job loss was in fact a diversion of working age men and women into ‘economic inactivity’ and in particular into what the Census called ‘permanent sickness.’

In many ways, coal transition in the UK is a story of caution for economies transitioning away from coal. The reactive nature of the policies and the functional and cognitive lock-ins impacted and delayed economic regeneration. The transition process continues to be underway given that the labour market is still difficult, the incapacity claimants may have peaked, but still remain above the national average and the jobs available are still in the low pay, low-skilled category. The economic revival of many former coal regions in the UK has taken close to 40 years (from 1980s closure policy, and not from 1920s when closures began), aided not in small part by a steady national growth (until the 2008 recession). The share of the population employed in manufacturing in OIRs is much than those employed in services, particularly in comparison to cities like London, Manchester, Liverpool etc. Nonetheless, these regions are not in a decline, or as distressed as they used to be (Beatty & Fothergill, 2020).



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Between 2000 and 2013, ~ €905 million have been earmarked for regional development initiatives, a majority of which comes from EU funds and the national budget

OTHER TRANSITIONS

Alongside these stories, there are also cases in Central and Eastern Europe, where coal transitions either stalled or happened slowly. The Salgótarján Microregion in Hungary, Zasavje Region in central Slovenia, Zwickau-Lugau-Oelsnitz in Germany (where the path dependency has shifted from coal to car manufacturing) are a few examples where the transition process remains incomplete. The Salgótarján Microregion for example in rural Hungary saw job losses and unemployment as coal mines became unprofitable. Unemployment in the region increased from 0 per cent in 1980 to 12.8 per cent in 2007, as against the national average of 7.4 per cent (Horváth & Csüllög, 2012). As most companies had already left the area before any transition plan could be put in place, lack of funds and inadequate planning by the central and local authorities stalled economic regeneration and environment remediation.

The Zasavje region in Slovenia has been losing its population in tandem with mine closures in the area. The labour force in the region exceeded the number of jobs available by 29 per cent in 2010 even as unemployment in the region peaked at 16 per cent in 2001 (Marot, 2012). This is despite the fact that the closures were planned with funds being set aside and the government adopting regional development strategies. Between 2000 and 2013, ~ €905 million have been earmarked for regional development initiatives, a majority of which come from EU funds and the national budget (Marot, 2012). However, issues such as ownership of mining land, stringent funding conditions for businesses, and lack of funding for rehabilitating degraded land is stalling development of the region.

These case studies highlight the long, daunting, often painful process that countries and regions have undergone or are still undergoing while transitioning their economies away from coal. In these places, the functional, cognitive, and political lock-in played a significant role to hamper the transition process. Under the 'Just Transitions' framework used in this discussion note, only 3 of the 5 features were carried out, namely, financial packages for workers, and power plant owners, strategies for economic regeneration/diversification, and environment remediation. However, the process was not driven by local factors or local inputs which often hampered implementation. The past transitions were successful to an extent when they accounted for local factors and involvement of local stakeholders i.e., a participatory process.



CLIMATE-BACKED POLICIES ON COAL TRANSITIONS

The ongoing transitions are different since they are being premediated given concerns on climate change. Experience from past transitions has provided an incentive for the ongoing transitions to be inclusive of local stakeholders and plan economic regeneration via a multi-decadal regional industrial policy. The summaries provided below follow the template highlighted in section two on the components of just transition and the process being followed. Some countries show more progress in the just transition dialogue than others. However, barring South Africa, none of the countries or regions have coal dependencies as high as India.

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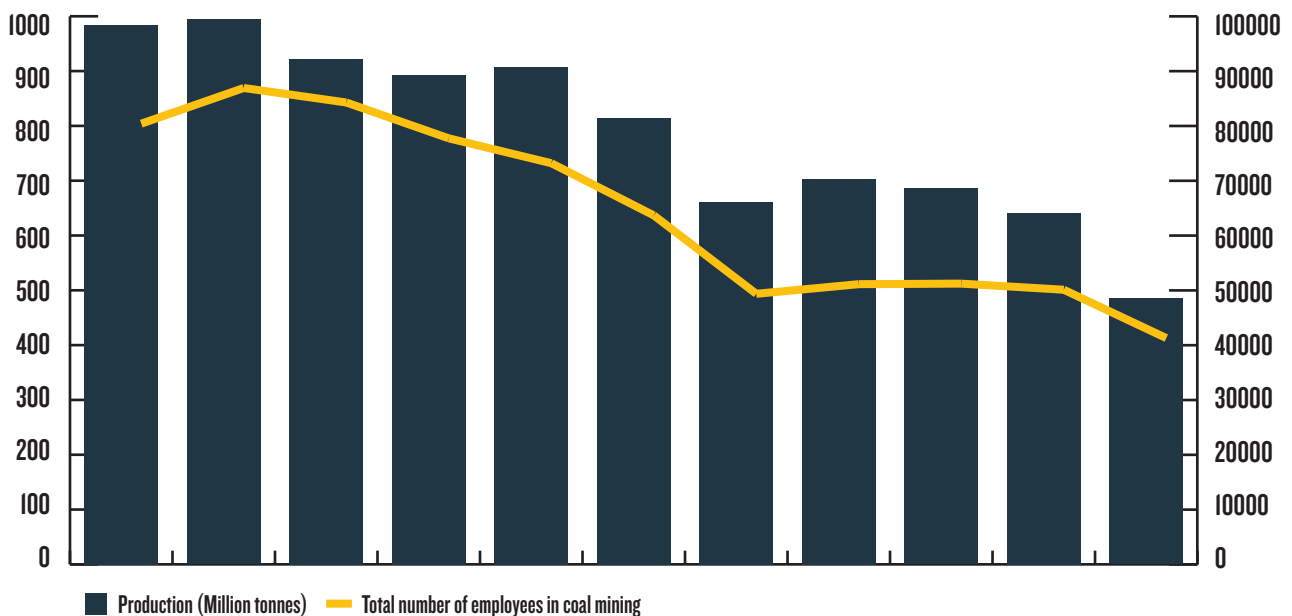
UNITED STATES OF AMERICA

Coal transitions has been going on in the US since the 1960s. Coal jobs declined by about half since 2010 while the share of coal in the US energy mix declined from 29 per cent in to 11 per cent in 2020 (Federal Government Initiatives).

The key federal level initiative before the current administration to support the climate agenda was the Partnerships for Opportunity and Workforce Economic Revitalisation (POWER) Plus plan (CRS, 2019) launched in 2015. Components included economic diversification and adjustment of coal communities, social welfare for coal mineworkers and their families, accelerated clean-up of hazardous coal abandoned mine lands, and tax incentives to support the technological development and deployment of carbon capture, utilization, and sequestration technologies. The funding for this plan were allocated from the federal budget.

FIGURE 5:
Coal sector employment and production in the United States of America

Source: (USEIA, 2021).



US Federal Govt initiatives for coal communities from FY15-FY19 (in million dollars)

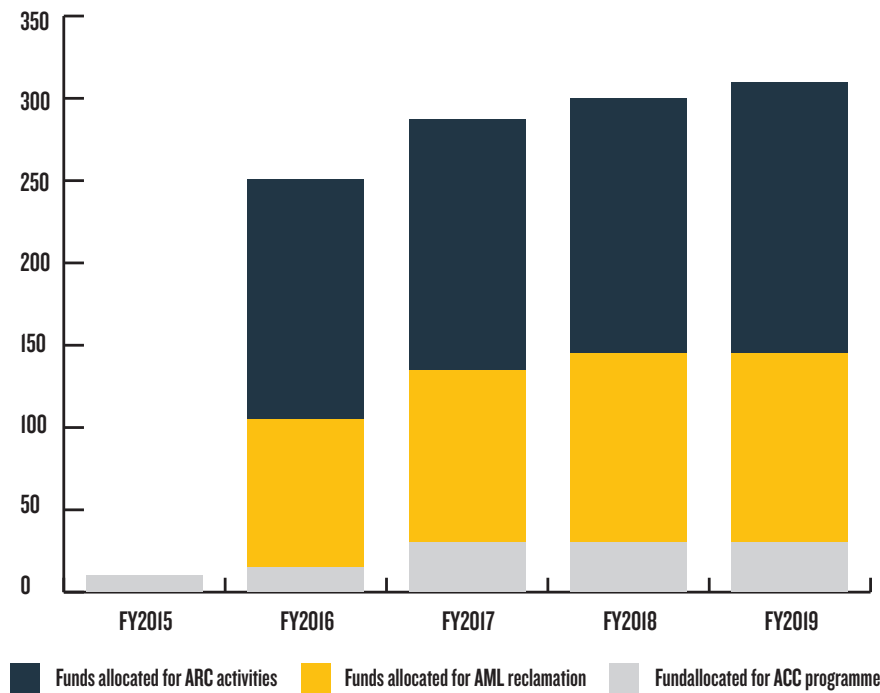


FIGURE 6:
A snapshot of activities by the US federal government between FY15-FY19 for affected coal communities

Source: (CRS, 2019)

FEDERAL GOVERNMENT INITIATIVES

OBAMA AND TRUMP ADMINISTRATION

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The plan involved participation from multiple agencies including the Appalachian Regional Commission (ARC), a regional commission set up to address issues of workers and tribes in the Appalachian region. Following the election of President Trump and his election promise to revive coal and save coal jobs, many elements of this plan were not enacted in its entirety, but some legacy programmes continued to receive annual budgeted allotments. One such initiative was Assistance to Coal Communities (ACC) which pumped \$115 million in coal communities between FY15 and FY19. Another initiative was Abandoned Mine Land (AML) investments which sought to reuse the land for economic and community development. The annual budget allocated \$90 million to this initiative in FY16 which increased to \$115 million by FY19. The maximum allocation under this initiative was set aside for the Appalachian region. The third initiative that continued to receive funding was the ARC. **Through these three initiatives alone, the US federal government pumped \$1158 million directly to strengthen economic development and infrastructure in coal bearing communities between FY15-FY19 (Figure 5).** However, this is still a fraction if one compares it to the income loss in the region.

Colorado despite producing just 2 per cent of the total coal in the US (USEIA, 2021) passed a legislation in 2019 to develop a transition plan



BIDEN ADMINISTRATION

Under President Joe Biden, the US government is taking an even more proactive stance on coal transitions. The President under an executive order established an interagency working group on coal and power plant communities and economic revitalisation. This was similar to the Coal Commissions being set up in countries across Europe to study impact on coal mining areas. The Interagency Working Group released its first report (2021) recently which had a strategy to strategize the transition process:

- **Identified** 25 most impacted regions due to coal decline as priority energy communities for targeted intervention. These regions were selected on the basis of direct coal-related jobs as a percentage of the total number of jobs in each region and which would face additional mine and power plant closure in the near term (Figure 6).
- Created a **governance framework** with subcommittees for stakeholder consultation, investments, integration, and policy. Each of these subcommittees will handle different aspects of the transition process and become the focal coordination points for regional agencies. Also instituted the process to create regional and local communities for the transition process.
- To conduct **stakeholder consultation** in all 25 identified regions and constitute a subcommittee of local leaders who will provide suggestions for the transition roadmap. This formal advisory committee is expected to comprise of community, labour, private sector, philanthropy, government, tribal, and environmental justice leaders, thus ensuring that the transition process is inclusive and localised.
- **Identified existing funding** up to \$37.9 billion available with 10 departments across the federal government which could be leveraged to invest immediately in these communities.
- Prepare a **long-term roadmap** for transition.

FIGURE 7:
Priority Energy Communities
identified by the Interagency
Working Group

Source: (Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization, 2021)

Rank	Area Name
1	Southern West Virginia non-metropolitan area
2	East Kentucky non-metropolitan area
3	Wheeling, West Virginia-Ohio
4	South west Virginia non -metropolitan area
5	Alaska non-metropolitan area
6	West Kentucky non-metropolitan area
7	Bremerton-Silverdale, Washington
8	Eastern Wyoming non-metropolitan area
9	Western Wyoming non-metropolitan area
10	Arizona non-metropolitan area
11	Northern West Virginia non-metropolitan area
12	South Illinois non -metropolitan area
13	Central Utah non-metropolitan area
14	Southern Indiana non -metropolitan area
15	California-Lexington Park, Maryland
16	Farmington, New Mexico
17	North east Virginia non-metropolitan area
18	West North Dakota non-metropolitan area

Rank	Area Name
19	Greeley, Colorado
20	College Station-Bryan, Texas
21	South west Alabama non-metropolitan area
22	Grand Junction, Colorado
23	Beckley, West Virginia
24	Charleston, West Virginia
25	Western Pennsylvania non-metropolitan area

STATE AND LOCAL LEVEL INITIATIVES

At the state level, some coal producing states are already looking at a no-coal scenario. One such state is Colorado whose transition plan and process is similar to the national plan drawn up by the interagency working group. The state despite producing just 2 per cent of the total coal in the US (USEIA, 2021) passed a legislation in 2019 to develop a transition plan. This legislation (HB 19-1314) defined a coal transition worker¹ and a coal transition community². It set up an Office of Just Transition (OJT) under the Department of Labour and Employment and commissioned an advisory committee to draw up the draft transition plan. The OJT was tasked with establishing a transition advisory committee, identifying location and timing of facility closures, providing administrative, research, policy, and logistic support to the state government, and preparing an action plan for coal bearing communities (Markuson, 2021). The advisory committee comprised of state and local representatives, consulting, and business organisations, and think tanks created four sub-committees on economic development, workers, finance, and disproportionately impacted communities with relevant local stakeholders and experts. They conducted focussed group discussions across different counties to identify vulnerabilities and differences in impact which fed into the economic evaluation study. Based on these meetings,

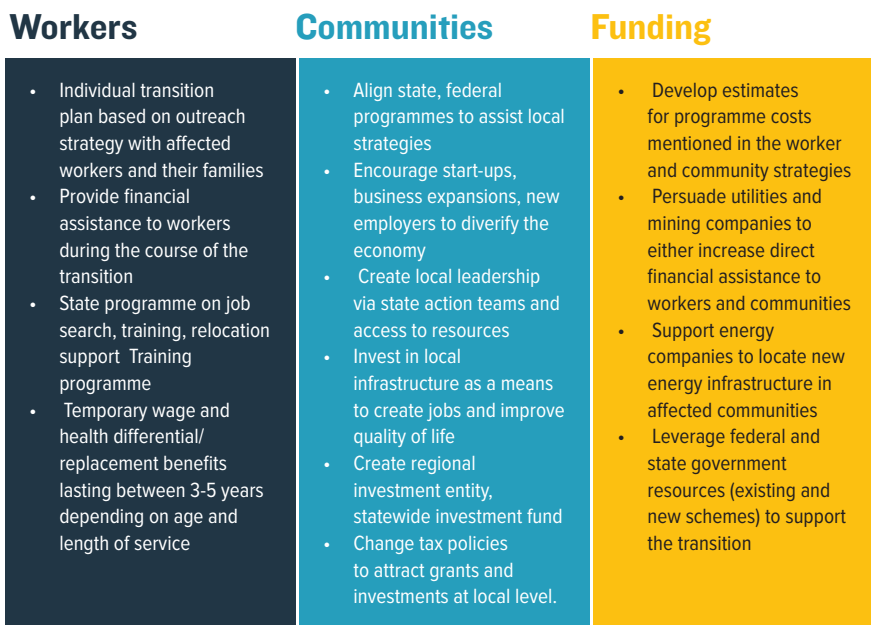


FIGURE 8:
Key elements of the Colorado Just Transition Action Plan

Source: (Office of Just Transitions, 2020)

1 A Colorado worker laid off from employment in a coal mine, coal-fueled electrical power generating plant, or the manufacturing and transportation supply chains of either. (Office of Just Transitions, 2020)

2 A municipality, county, or region that has been affected in the previous twelve months, or that demonstrates it will be impacted in the next thirty-six months, by the loss of fifty or more jobs in total from a coal mine, coal-fuelled electrical power generating plant, or the manufacturing and transportation supply chains of either.

inputs, and study, in December 2020, the OJT prepared an action plan (Office of Just Transitions, 2020) on coal transitions for the state of Colorado.

The action plan includes an immediate, medium, and long term goal (Figure 7). It also highlights existing or new agencies who will manage the features of the action plan.

The OJT estimated that the cost to only transition the workers (wage and health differential/replacement) will be about \$100 million. While it is too early to discuss the impact of the Colorado transition plan, some of the takeaways from the plan for other policy makers include:

- The 2019 legislation and the transition plan defined a coal transition worker and a community, essentially codifying the target/affected group.
- Inclusion of local leaders, local/displaced labourers in the committee and subcommittee, thus ensuring local support for implementation.
- Outreach strategy with coal communities and local leaders to include their ideas in the transition strategy.
- Recognises that the transition will impact the entire coal supply (mine-to-mouth) and therefore incorporating a strategy to tackle affected workers and communities at all levels.
- Recognises that the transition should be locally driven and state and federal governments must ensure resources during the duration of the transition.



The Appalachian region comprises 27 per cent of the total coal production in the US

Local NGOs and civil society have also been actively involved in supporting the transition process. Some like the Power River Basin Resource Council in Wyoming are petitioning local leaders to prepare alternate strategies to create a diverse economy and organising webinars to discuss supportive resources and economic opportunities for displaced workers and families (Powder River Basin, 2021). Another local group promoted by the nonprofit organization Appalachian Voices is amplifying residents' ideas for new economic initiatives to offset job losses and shrinking coal tax revenues (Handler, Henry, & Bazilian, 2020).

REGIONAL INITIATIVES

The Appalachian Region Commission is a regional economic development agency comprising 13 Appalachian states and 420 counties. This commission is a state-federal partnership with the economic development activities being funded by the federal government. It commissioned a 5-part study in 2018 to understand the current and potential impact of declining coal production on the region (Bowen, et al., 2018). The Appalachian region comprises 27 per cent of the total coal production in the US. This study found that decline in coal production in the US meant that 123 counties of 420 have lost most of the jobs in the coal industry ecosystem (supply chain), 124 counties are at risk of future coal decline, and 83 counties are highly vulnerable since they host both coal and coal industry ecosystem jobs. The study also found that retiring a 500 MW plant in a mid-size county results in a 5 per cent decline in wage and salary income while retiring a 1500 MW plant results in a 13 per cent decline. It found that highly paid coal miners (average annual income of \$836,001) have limited opportunities in terms of re-employment in similar occupation and pay scales.

The ARC had continued to receive funding under the Obama and Trump administration. In coal communities, ARC initiatives include entrepreneurial and business development, workforce development, infrastructure development and strengthening leadership

and community capacity. As per US Congressional records, since 2016, investments of over \$148 million have been made in 312 counties via 185 projects (CRS, 2019). This has leveraged an estimated \$772 million in private investments in the 13 states under ARC service area. The ARC also built philanthropic partnerships and create two initiatives – Appalachian Transition Fellowship programme and the Just Transition Fund. The fellowship programme connected 12 next-generation leaders with 33 cross-sector organizations to advance work in alternate sectors of food, health, textiles, and renewable energy across Central Appalachia. The first awards of the Just Transition Fund created to help the region’s coal-impacted communities helped 19 organisations apply for POWER grants to support their work in both coalfield and power plant transitions by providing a seed of \$436,500 (ARC, 2015).

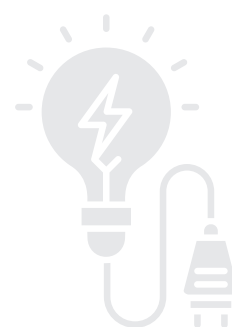
However, research suggests that these initiatives and policies alone may not meet the needs of all coal communities, particularly remote isolated coal-dependent ones. Roemer and Haggerty (2021) and the report by the OJT advisory committee of Colorado (Just Transition Advisory Committee, 2020) found that existing funding from EDA and ACC is insufficient to meet community needs and tends to focus on immediate impacts of closure rather than long-term planning. Further, vulnerable communities tend to lack a clear vision of what a post-coal economy looks like, and therefore, find it challenging to leverage federal resources.

CANADA

The Canadian Just Transition plan is being undertaken for four provinces – Alberta, Saskatchewan, Nova Scotia, and New Brunswick. In 2018, Canada decided to phase out coal-fired electricity and launched the ‘Task Force on Just Transition for Canadian Coal Power Workers and Communities’. This commission was chaired by the President of Canadian Labour Congress and included representatives from many workers and communities. This task force met various stakeholders including coal workers and their families, employers, labour union representatives, provinces and municipalities, civil society actors, business organisation representatives to gather suggestions and gain perspectives to frame a Just Transition policy. They travelled to the four affected provinces, toured seven facilities, hosted eight public sessions, visited 15 communities, and met with more than 80 stakeholder groups (Task Force on Just Transition for Canadian Coal Power Workers and Communities, 2018). The Task Force submitted two reports in 2019. The first report was a 10-point recommendation agenda (Annexure 2) that identified ‘respect for workers, unions, communities, and families’ and ‘worker participation at every stage of transition’ as crucial, foundational principles for effective transition strategies (Wiseman, Workman, Fastenrath, & Jotzo, 2020). The second report captured a snapshot of the affected provinces, worries of coal workers and communities, their idea of just transition, and local inputs to frame the 10-point agenda.

The 10-point recommendation programme largely follows the principles of just transition as per section 2 of this document. The second report lends voice to concerns by coal communities about the transition, including the impacts on children, families, home values, and their overall future. These consultations helped the Task Force bunch concerns and solutions which are common - for workers and communities – and those which had to be dealt with at a provincial level. This process also led to inputs on opportunities for economic diversification based on localised conditions. Such processes help reassure communities that

Based on the recommendations by the Task Force, the Canadian government committed USD 26 million to set up Worker Transition centres for skill development, and advance projects for economic diversification





These events compounded the mistrust, sense of abandonment and cynicism that the Latrobe Valley coal community had towards the government promises

their concerns are taken into cognisance, provide legitimacy to the just transition plan, and aid social inclusion of the impacted workers and communities.

Based on the recommendations by the Task Force, the Canadian government committed USD 26 million dollars to set up Worker Transition centres for skill development, and advance projects for economic diversification. The government also intends to set up USD 113 million dollar infrastructure investment fund which will be managed by the regional agencies like the Western Economic Diversification Canada and the Atlantic Canada Opportunities Agency.

LATROBE VALLEY, AUSTRALIA

In Australia, the process of the closure of the Hazelwood power plant and its aftermath offers useful suggestions on to manage a transition process, especially given the closure had huge implications for the community and the electricity price in the Victoria region. Brown coal mining began in the Latrobe region in 1887 and eight units of the Hazelwood thermal power plant became operational between 1964-1971. In 1981, the coal mining and power generation operations employed over 10,000 workers. The period from 1994-2017 was marked by privatisation as the plant changed multiple hands, job losses as full time employment fell by 9 per cent, and policy flip-flops on carbon pricing (and its cascading impact on coal power prices) as power changed hands between the Labour and the Liberal-National parties at the state and centre level, all of which was aggravated by the mismanagement of the investigation into a mine fire which happened in 2014. These events compounded the mistrust, sense of abandonment and cynicism that the Latrobe Valley coal community had towards the government promises. This was further compounded by the manner in which the plant shut down in November 2016. Workers were given no notice as the owners (Engie), the company asset manager, and the Commonwealth Energy Minister continued to make public statements that the plant would not close until October 2016 (Wiseman, Workman, Fastenrath, & Jotzo, 2020).

The abrupt shutdown in November 2016 resulted in backlash from the coal workers, trade unions and the community. This ensured a compensation package by the central govt of USD 43 million (Coenen, Wiseman, & Campbell, 2018). Simultaneously the Victorian State government announced the establishment of the Latrobe Valley Authority (LVA) along with AUD 22 million for workers assistance, an additional AUD 224 million to promote economic growth, investments and job creation and another AUD 345 million for infrastructure development including upgrading the Gippsland rail line in the region (Coenen, Wiseman, & Campbell, 2018), (Wiseman, Workman, Fastenrath, & Jotzo, 2020). Between 2016 and 2019 the LVA initiated different initiatives like the Worker Transition and Transfer schemes, numerous initiatives to promote entrepreneurship, rehabilitation of mine sites, multiple community forums to identify community and regional priorities and the Gippsland Smart Specialisation strategy.

A review of the initiatives and their impact between 2016 and 2020 by Wiseman, et al (2020) suggests that establishing the LVA '*provided an important institutional foundation for collaborative and evidence based multi-level governance and policy implementation*'. Further, despite the initial job losses, employment trends show growth in numbers between 2016 and 2020 aided by significant resource allocation to the retraining and reskilling programmes. The Smart Specialisation policy helped in identifying collaborations and investments which could enhance the regional economic strengths in energy, food, health, and tourism economy.

EUROPEAN UNION

The transition away from coal began decades back in Europe given declining competitiveness of European coal mining. Today it is being driven by EU's climate and clean air objectives. This transition however is still incomplete and differs by countries. Some like Poland generate more than 80 per cent of electricity from coal and nine states including UK having marginal or no use of coal in power generation. According to the European Commission's (EC) 2018 report (Alves Dias, et al., 2018), there were 128 coal mines in 12 member states, with the largest being in Poland (35), Germany and Bulgaria (12 each), and 207 power plants in 21 member countries. 58 coal mines were closed between 2014 and 2018 in Czechia, Germany, Hungary, Poland, Romania, Slovakia, Slovenia and the United Kingdom, Italy, and Spain. The European coal sector employs about 2,38,000 in coal mining and power plants and ~2,15,000 throughout the coal value chain in supplying equipment, R&D etc to coal companies (Widuto, 2019). Poland employs the highest number of people, followed by Germany and Czech Republic (Figure 8). The largest number of coal power plants are in Germany (53) and followed by Poland (37) (Widuto, 2019). The 2018 study by the EC estimated that with mine and power plant closures, 1,60,000 jobs were expected to be lost by 2030. The most significant job losses would be felt in Czech Republic, Poland, and Germany between 2020 and 2025 and in Poland and Bulgaria between 2025 and 2030 (Alves Dias, et al., 2018).

Country	Jobs in coal power plants	Jobs in coal mines	Indirect coal jobs
Poland	13000	99500	87760
Germany	10900	24700	34366
Czech Republic	3600	18000	19229
Romania	3600	15000	10101
Bulgaria	2700	11800	15220
Spain	3300	3400	9643
Greece	1600	4900	4166
United Kingdom	4100	2000	6276
Slovakia	500	2200	2058
Italy	2400	300	3970
Hungary	900	1700	4735
Slovenia	600	1300	1833
Finland	1100	0	3240
Denmark	1000	0	2429
Netherlands	900	0	3995
Portugal	700	0	1229
France	600	0	1237
Austria	500	0	1943
Ireland	400	0	378
Croatia	200	0	385
Sweden	100	0	573

FIGURE 9:
Country-wise direct and indirect jobs in the European coal sector in 2018

Source: (Alves Dias, et al., 2018)

In 2010, a Council Decision (2010/787/EU) stopped state aid for uncompetitive mines and mandated that these mines should close by December 31, 2018



REGIONAL INITIATIVES

In December 2019, the EC presented the European Green Deal for a climate-neutral Europe by 2050. One of the features of the deal was to propose a legally binding European Climate Law (ECL) to reach climate-neutrality by 2050. To support funding for ECL and the green deal, the European Commission in its Multi-annual Financial Framework (MFF) for the period of 2021-2027 committed to spend 25 per cent or € 320 billion on climate-related activities. Under different grants and loans, member states can leverage almost € 524 billion to supplement national commitments (Annexure 1).

In 2010, a Council Decision (2010/787/EU) stopped state aid for uncompetitive mines and mandated that these mines should close by December 31, 2018 (EC, 2010). This led to a phaseout of at least 58 mines which were uncompetitive between 2014-2018. The council decision had a major impact on Germany and Spain which were the two major economies giving subsidies for coal production in 2000s. The EC approved Spanish state aid plans to grant a € 2.13 billion (\$2.36 billion) package in 2016 to help alleviate the social and economic impact of closing 26 uncompetitive mines (EC, 2016). Simultaneously a number of initiatives have been taken including structural support for 21 pilot coal regions in their efforts to transition in 2017, a dedicated platform for coal regions in transition to discuss strategies and exchange best practices and establishing a secretariat for the initiative for coal regions in transition to connect with stakeholders and share resources.

While undertaking the public consultation process ahead of adopting the MFF, the commission found that while 85 per cent of the 4395 respondents considered the transition to a low carbon and circular economy as an important challenge, only 42 per cent believed that this challenge could be adequately addressed by existing programmes and funds. Therefore, to supplement existing programme and funds, the European Parliament in its interim report in November 2018 called for the introduction of new 'Just Transitions Fund' to address societal, socio-economic, and environmental impacts on workers and communities adversely affected by the transition from coal and carbon dependence (EC, 2020). This fund, which is part of the European Green Deal, has three main pillars:

- **Just Transition Funds of €17.5 billion:** This will support economic diversification in impacted regions and enable their conversion from coal and allied sector dependency. Countries will have to match every euro coming out of the EU budget with € 1.5-3 of their resources from other EU funds. In total, the EU expects to mobilise something like € 30 billion by 2030 to mitigate social and economic impact of coal transitions. Member states will have to prepare one or more territorial just transition plans for areas in NUTS level 3 regions (those most vulnerable to coal phaseout) and outline the transition process until 2030. The highest allocations in this pillar are going to Poland, Germany, Romania, and Czech Republic and the focus is new projects for economic diversification and reconversion of coal mining areas.
- **InvestEU Just Transition Scheme:** The fund will be complemented by a dedicated scheme under InvestEU by another € 1.8 billion. This will support a wider scope of investments including energy and transport infrastructure, decarbonisation projects, district heating, gas infrastructure etc.
- **New public sector loan facility:** This will be set up together with the European Investment Bank and will finance public infrastructure which may not be commercially profitable. The EU support could take the form of inter alia an interest rate subsidy or an investment grant, financed from the EU budget, which will be blended together with loans extended by the EIB to municipal, regional and other public authorities.

COUNTRY LEVEL INITIATIVES

GERMANY

The country is the largest producer of lignite in Europe and has the second highest labour force in the direct and indirect coal sector. For every direct employee in the lignite industry in Germany, there are roughly 1.8 indirect and induced employees (Oei, Brauers, Teichmann, Kemfert, & Wehnert, 2019). To phase out coal, Germany set up a multi-stakeholder 'Coal Commission' body in 2018 to identify the target year to phase out coal, identify regions and assess the impact of a phaseout on lignite regions.

Based on their recommendations on 14th August 2020, the Act to Reduce and End Coal-Powered Energy and Amend Other Laws entered into force by which Germany will gradually reduce and end coal-powered energy by 2038. In addition to this, another act 'Structural Development Act' for coal mining regions entered into force providing lignite regions with financial aid of up to € 14 billion (\$11.86 billion) until 2038 to deal with structural changes and to secure employment. The act also provided hard-coal regions with financial aid of up to 1.09 billion euros (\$923 million) and provides up to € 26 billion (\$22.02 billion) for investment in infrastructure development, expansion, and creation of new jobs (Gesley, 2020). In total, the coal and lignite mining states of Saxony, Saxony-Anhalt, Brandenburg, and North Rhine-Westphalia will receive € 40 billion between now and 2038. The following are some of the main features of the coal exit law:

- Reduce power generated from both hard coal and lignite by 15 GW each by 2022
- Further reduction by 8 GW for hard coal and 9 GW for lignite by 2030
- No coal power capacity left by 2038
- Three reviews in 2026, 2029 and 2032 to decide if the phase out can be completed by 2035
- Offer voluntary reduction scheme to coal plant operators via an auction system where operators offer capacity and receive financial compensation in return
- Financial compensation paid for per MW capacity reduction decreases every year until 2027, post which no financial compensation will be paid to operators
- Legally mandated reduction post 2027
- In case of lignite plants, the act fixed a decommissioning date for each plant along with compensation that the plant operators will receive. RWE will receive € 2.6 billion (\$3.1 billion) in 2029 and Lausitz Energie Kraftwerk AG (LEAG) will receive € 1.75 billion (\$2.06 billion)
- Adaptation payments for older workers in lignite mines and coal and lignite power plants. These would amount to a maximum of € 5 billion by 2048

As mandated by the coal exit law, the Federal Network Agency (BNetzA) have been conducting auction processes to reduce coal capacity. The tenders are based on the capacity that will be taken offline and price per MW. The agency awarded the bids based on the ratio between the asked compensation price and the resulting CO2 emissions reduction (Wehrmann, 2020). The auctions were planned as follows:

- First auction in September 2020 to take 4 GW offline - maximum remuneration € 165,000 /MW
- Auction for 2021 to take 1.5 GW offline - maximum remuneration € 155,000 /MW
- An auction in early 2021 with the volume necessary to reach the target of having 15 GW left at the end of 2022 - maximum remuneration € 155,000 /MW



...the Act to Reduce and End Coal-Powered Energy and Amend Other Laws entered into force by which Germany will gradually reduce and end coal-powered energy by 2038

- Another auction in summer 2021 for capacity to be taken offline by 2023 - maximum remuneration € 116,000 /MW
- More auctions in 2022-24 for capacity to be taken offline by 2024-2026 - maximum remuneration € 107,000/98,000/89,000 and 89,000 /MW (Wettengel, 2020).

Two auctions have been conducted so far with a total capacity of 6.29 GW expected to go offline to meet the 15GW reduction schedule. The first round of the auction in 2020 was oversubscribed, leading to a much lower average compensation of € 66,000 /MW from the ceiling of 1,65,000/MW (Wehrmann, 2020). The second round of auction in 2021 was similarly oversubscribed with three plants of a total combined capacity of 1.514 GW receiving between zero and € 59,000 /MW, much lower than the ceiling price of € 1,55,000 /MW (Appunn, 2021).

SPAIN

In Spain, the 2010 regulations forced the closure of coal mines in 2018. This closure was preceded by negotiations between the Spanish government and trade unions on compensation packages. A €250 million framework agreement has been drawn to support a just transition in coal-mining areas. The agreement includes support to coal miners with early retirement schemes, redundancy payments and reskilling schemes for green industries, environmental restoration work in pit communities, and investments in coal mining regions over the following 10 years in facility upgrading and economic regeneration projects. Union leaders have referred to it as an example of good practice in just coal transitions (EBRD, 2020). But such initiatives in the past have not fructified adequately. Spanish coal mines were in isolated areas which has made reconversion challenging. There were seven regions included in El Plan del Carbón 2006-2013 — Asturias, Castilla y León, Castilla-La Mancha, Galicia, Aragón, Andalucía and Cataluña.

In Asturias, for example, the labour unions said that the funds for the transformation of the mining areas have not had the desired effect, leading to a pensioner economy. *“There aren’t opportunities here. Firms able to create employment have not been set up, but we have the best sidewalks and streetlights”* argues Angel, a pre-retired miner. According to Colinas, secretary general for UGT in the mining areas in the North of Spain “the industrial estates in the mining areas are empty, the support funds have been used to build business such as a petrol stations or garages that do not provide jobs (Río, 2017).

A €250 million framework agreement has been drawn to support a just transition in coal-mining areas.



POLAND

The Polish energy economy is similar to India with its high reliance on coal to power its systems. The country’s communist past has contributed to the political economy of coal which has a strong functional, political, and cognitive lock-in. Poland’s coal economy has a large number of coal sector employees (although not as large as India today, see Figure 8), strong presence of coal labour unions, state-owned assets (coal mining and thermal power), supportive state-owned media, political representatives and structures and public support for the coal industry as a job creator (Brauers & Oei, 2020). This structure has resulted in significant state subsidies to keep the Polish coal industry competitive, state-owned utilities forming mining groups to rescue bankrupt companies, and political parties winning elections based on promises to save the coal industry. Further, any discussions on restructuring or shut downs have been

blocked by strikes, many of which have been violent (Wilczek, 2020), (Skoczkowski, Bielecki, Kochański, & Korczak, 2020), (Baran, Szpor, & Witajewski-Baltvilks, 2018).

National

Two parallel processes are being carried out to phase out coal in Poland. In September 2020, after months of negotiation, the government of Poland signed a historic agreement with labour union representatives to phase out coal by 2049 to meet the EU's climate neutrality law by 2050. The agreement requires approval by the European Union since the Council had set 2018 as the deadline to phase out state aid to hard coal mines. The deadline of 2049 means that Poland will require special permission to continue providing state aid during the closure process. It may also be difficult for the Polish government to access the EU's JTF since provisions regulating the fund state that the Member States which do not commit to implementing the objective of achieving a climate-neutral EU by 2050 will receive only half of the allocation from the JTF. Up to date, the Polish government has not clearly committed to this objective (niegocki, 2021).

Separately the agreement also guarantees miners' employment until retirement and severance packages in case of earlier layoffs. It also means that the government will continue to subsidise coal mining until 2049 even as it plans to pump 60 billion zlotys (USD 15.65 billion) into coal mining regions under the EU's Just Transition Funds (Harper, 2020) (Farand, Poland agrees coal mining phase out with unions by 2049, 2020). Further, the Polish government is seeking to restructure the coal sector by nationalising 70 coal plants under a single state entity – National Energy Security Agency (NABE) – to allow the three state-owned energy companies fiscal space to develop clean energy sources (Farand, 2021). These plants will be kept running at the cost of public money since of the total installed capacity of 24.8 GW, only 6.8GW coal plants did not generate an operating loss in 2021. An analysis of the costs and revenues by P Czyżak and W Kukuła (2020) for each coal-fired power unit included in the restructuring plan shows that even with extremely optimistic assumptions, NABE will generate multi-billion losses (USD ~8.11 billion) over the period of its operation. As a result of the restructuring, the PGE Group (the most prominent state-owned utility), will gain USD ~8.08 billion, whereas NABE will incur a loss of about USD -7 billion. Moreover, it is assumed that PGE's private debt will be taken over by the State Treasury. NABE will also be in possession of coal assets that will rapidly lose their value. It means that PGE will benefit in economic terms and the loss will be suffered by the State Treasury.

Multilaterals like the World Bank are also funding knowledge sharing initiatives between coal mining regions in different countries. Poland's National Fund for Environmental Protection and Water Management (NFEP&WM) in coordination with the World Bank and the EC, plan to support studies, visits and meetings with representatives from Ukraine's private and public sector to chart new transition pathways for coal areas in both countries (Bank, 2020).

Regional

Separately, to coordinate with the European Initiative for transformation of mining regions, Silesia which is the largest coal mining region in Europe, constituted a regional committee to undertake to facilitate dialogue and plan for its transition in 2019. The committee is headed by a Marshal, and constitutes 55 members from central, regions and local governments, trade unions, business associations, NGOs, scientists, and cultural institutions. This committee has prepared a just transition plan, including the priority areas (R&D, circular economy, improving skills etc.) for the allocation of the EUR 2bn fund from EU's JTF budget for Silesia, has been holding

the government will continue to subsidise coal mining until 2049 even as it plans to pump 60 billion zlotys (USD 15.65 billion) into coal mining regions under the EU's Just Transition Funds



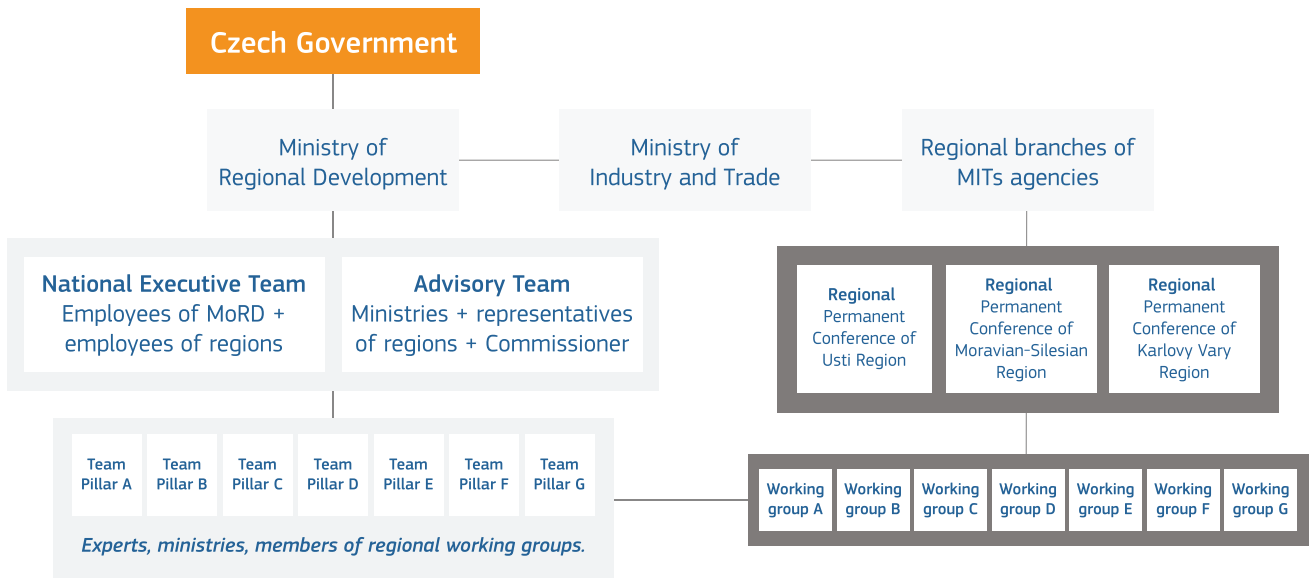


FIGURE 10:
Governance Framework of the
Re: Start Strategy

Source: (EC, 2019)

public consultations and workshops in coal mining communities to get feedback on its plan and has created a website for transparency of its processes.

CENTRAL EUROPE

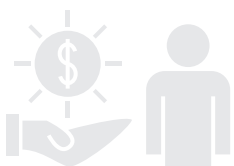
Other countries where coal phase out remains a challenge is Bulgaria, Czech Republic, Hungary, Romania, and Slovakia. Czech Republic set up a Coal Commission on similar lines of Germany which recommended an exit date of December 2038 to phase out coal. Simultaneously, the national government also decided to implement a national RE:START strategy to support transition in coal communities in 2015. For the first three years the strategy focussed on developing a strategic framework (

Figure 9), gathering information, assessing the needs of regions, and setting up an effective governance structure and is now shifting focus on implementation (EC, 2019).

Romania has agreed to phase out coal by 2032 and will pass a law by mid-2022 to address mine closure and adopt socio-economic measures to support coal communities. The country plans to set up a coal commission similar to Czech Republic and Germany to work out the details of the transition (Neagu & Taylo, 2021). Slovakia aims to phase out coal-fired electricity generation by 2023 and has signed on to the Powering Past Coal Alliance. An action plan for the country's coal-producing Upper Nitra region was cited as an effective bottom-up approach since it enjoyed strong support from local officials (Cahill, 2020). Hungary will phase out its last remaining coal plant by 2025 and drive just transition through setting up a 200 MW solar farm on the plant site and replace the lignite units with 500 MW gas plant (Beyond Coal, 2021).

EMERGING ECONOMIES

Ongoing research on just transition shows that one of the biggest challenges in translating the approaches from developed countries to emerging economies is the high incidence of the informal economy. Most countries do not have accurate estimates of the number of informal workers involved in mining. To share a few examples, in South Africa, these are called 'zama zamas' or those who try and try in the Zulu language Often, they are miners who have been left jobless after the mining



As of 2018,
~89,000 people
were directly
employed in coal
mining (formal
sector jobs),
50,000 in power
generation
(Eskom), and
26,000 in Sasol
(petrochemical
production)

companies moved on. In the local context these artisanal miners have been mining in abandoned mines for a while, and their activities are not seen as illegal (Ermelo, 2021). In Columbia, about 17 per cent of the medium coal mines and 50 per cent of the small scale producers in the inner regions don't have legal mining rights and yet about 70 per cent of the coal they produce is used for domestic consumption. There are no estimates on the number of informal workers in these mines (Błachowicz, et al., 2017). In India, 81 per cent of the labour force is employed in the informal sector/ shadow economy (with no social benefits) and if one were to include the portion of informal sector workers (contract/casual labourers), then the proportion is as high as 92 per cent (Punia, 2020). Estimates suggest that the size of the formal coal economy is about 7 million (Pai & Zerriffi, 2021) and the informal coal economy is about 2.5 million people (Lahiri-Dutt, 2016).

Translating ongoing approaches on compensation and voluntary retirements for workers; retraining and reskilling programmes, and economic regeneration implies having institutional support, something which informal coal workers without job or social security are likely to miss out on. Further, the reason for the persistence of the informal economy is quality of labour in terms of education and skill levels. A study by the International Labour Organisation found that 30 per cent of the labour force is illiterate, 52 per cent are educated up to secondary level (although 40 percent of this have less than 8 years of education), 7.2 per cent have general academic training but only 3 per cent have technical education at the tertiary level (Mehrotra, 2019). These characteristics imply that it is necessary to create a socio-economic job profile of the labour before undertaking retraining or reskilling programmes in developing countries to transition to better quality cleaner jobs. Ongoing research by the authors of this brief and others (Błachowicz, et al (2017), TERI (2021), iForest, (2021), Pai (2021), Chandra (2018)) suggests that developing countries therefore need to re-imagine the just transition process and make it localised and context specific.

SOUTH AFRICA

Coal is a dominant feature in South Africa's energy mix, both from a domestic and international perspective. Coal is primarily produced in the Mpumalanga province accounting for 19% of gross value added (GVA) in 2015 (Strambo, Burton, & Atteridge, 2019) and Eskom supplies about 90 per cent of the country's electricity. As of 2018, ~89,000 people were directly employed in coal mining (formal sector jobs), 50,000 in power generation (Eskom), and 26,000 in Sasol (petrochemical production). Given this context, South Africa has been at the forefront of the Just Transition process, particularly amongst emerging economies. Just Transition dialogues and processes have been going on for more than a decade, aided by cooperation between the coal trade unions, central government, and civil society.

Role of trade unions

Conversations around the process began in 2009 when the Congress of South African Trade Union (COSATU) passed a resolution that "*climate change was one of the greatest threats which will adversely affect the poor, working class and developing countries disproportionately and unless the working class and its organizations take up the issue of climate change seriously, all the talk about 'green jobs' will amount to nothing except being another site of accumulation for capitalists*" (Polity, 2011). This was followed by a convention of labour and over 300 civil society in October 2010 and resulted in a comprehensive policy position on climate change and just transitions by the trade union (COSATU, 2011). Simultaneously COSATU has been involved in a number of dialogues at the central and regional level, including the vulnerability analysis, the sector jobs resilience planning and social sector dialogues. Recently it joined hands with another union - Federation of Unions of South Africa – to

To deepen the work on Just Transition Pathways, the NPC embarked on a process of Social Sector Dialogues in 2017 with stakeholders from the civil society, businesses, government, and labour



While South Africa had seen an increase in access to international finance, it was not linked to mitigation, adaptation and just transition costs



propose a way for Eskom to reduce its debt that will avoid retrenchment of workers by having state owned institutions take over about half of the debt. This plan includes provisions for the company to engage in reskilling programmes for its workers and develop a just transitions plan for its workers (COSATU, 2020).

Government Process

In 2011, the government released a white paper on National Climate Change Response which highlighted amongst other things a vision of long-term, just transition to a climate-resilient and lower-carbon economy and society; vulnerability assessment of the impact of climate change on different sectors; and develop a Sector Jobs Resilience Plan (SJRP) (The Government of Republic of South Africa , 2011). This was followed by a document on the country's first National Development Plan by the National Planning Commission (NPC) in 2012 which included a chapter on ensuring environmental sustainability and an equitable transition to a low-carbon, climate resilient economy. This chapter indicated some guiding principles for a 'just' transition. Given this legwork, South Africa was the only country to mention 'just transitions' in its NDC submitted in 2015.

To deepen the work on Just Transition Pathways, the NPC embarked on a process of Social Sector Dialogues in 2017 with stakeholders from the civil society, businesses, government, and labour. This involved high-level social partner dialogues and progressed to a series of workshops in each province and engagements with various constituencies, such as the youth, labour, and business, through bi-lateral meetings and roundtables convened with partners (National Planning Commission, June 2019). Apart from recommendations on mechanisms for a 2050 clean energy pathway, the dialogues produced calls for immediate action including:

- Need for institutional responsibility for the planning and implementation of just transitions in South Africa
- Research on job absorption and losses by assessing project job losses in declining industries, job absorption potential in new green sectors, strategic skill development planning etc.
- Negotiating labour and social plans for power plant decommissioning
- Just transition pilots in vulnerable hotspots

In the next four years all of these action points were implemented. A vulnerability analysis under the National Employment Vulnerability Assessment of the economic (gross value added by coal in comparison to other activities) financial (number of people employed in coal versus other industries) and social (education, gender, and skill profile) parameters of coal provinces found that four municipalities in the Mpumalanga province – eMalahleni, Steve Tshwete, Msukaligwa and Govan Mbeki – were highly vulnerable. This was a result of undiversified local economy heavily reliant on coal mining and power generation as well as financial resources, relatively low skills, and limited mobility in the labour market (Makgetla, Maseko, Montmasson-Clair, & Patel, 2019). Parallely, SJRPs were being developed by different ministries. The SJRP for the coal sector value chain (Trade & Industrial Policy Strategies, 2020) which drew inputs from the vulnerability report recommended:

- Establishing national and regional SRJP offices to collaborate with municipalities, provincial government, and stakeholders in the coal value chain.
- Revising Social and Labour Plans – introduced in 2002 to address social conflicts associated with mining and support local economic development – to act as a driver for local economic diversification after mining closure

- Diversification of local economy with assessing job creation potential of mine rehabilitation to create areas for recreation and farming, generating renewable energy, and the circular economy around coal waste
- Identifying skills and needs of vulnerable workers to develop active labour policies
- Provide income support to vulnerable communities and workers during the transition

In accordance with the recommendations of the Social Sector Dialogues of 2017, in December 2020, the South African President Cyril Ramaphosa formed the Presidential Climate Change Coordinating Commission (P4C) to coordinate and oversee the Just Transition process. This body comprised representatives from government departments and state entities, business organisations, labour, academia, civil society, research institutions and traditional leadership. One of the first recommendations of the commission was that South Africa's updated NDC (not yet submitted) should *"should give expression to the need for a "just transition", to which Government and its social partners are committed"* (Presidential Climate Commission, 2021). The report also noted that while South Africa had seen an increase in access to international finance, it was not linked to mitigation, adaptation and just transition costs. Therefore, the commission recommended the NDC "indicate that South Africa requires considerably higher levels of international financial support to achieve higher levels of ambition and manage the transition away from a coal-dependent energy system. This support should specifically express the need for measures to address social and economic impacts of the transition process. The terms and conditions of such support should take into account national fiscal and development goals".

Just Transition Cost

Eskom has submitted a schedule for decommissioning between now and 2050 — 5.4 GW by 2002, 10.5 GW by 2030, 35 GW by 2050 (IRP, 2019). Initial estimates by the company for the decommissioning and just transition process over the next three years range between ZAR 8-10 billion (~USD 553-692 million). Another study estimates that the cost of just transition in the coal mining sector (relocation, retraining, pensions, and adjustment support for affected communities) will be ~ZAR 6 billion (~USD 415 million) over 20 years (Presidential Climate Commission, 2021).

Wrapping up

South Africa is one of the rare examples which has seen a convergence between trade unions, civil society, and governments when it comes to the conversation on just transitions. The conversation propelled by trade unions since 2009 found support from civil society and government quarters. The government on its part initiated a facilitative, collaborative, and transparent process through the social sector dialogues spanning a number of years involving all affected stakeholders. It is also backing the just transition process with evidence-based research through the National Employment Vulnerability Assessment that assessed the financial, social, and economic profile of workers in declining industries, and the sector-specific jobs resilience reports, that provided initial steps that will help transition to clean sectors. This formed the basis of creating a national authority (the Presidential Climate Commission) to coordinate and oversee the just transition process along with plans on state level SJRP offices to coordinate with local authorities. To be fair, there are several challenges including finding the money to fund the just transition process, overruling vested interests, inclusion of informal workers, and providing employment in a country which has been suffering from a severe unemployment crisis since 2010. However, the open, inclusive and transparent just transition process provides a useful template for developing countries to begin their own transition processes.

The end goal of the coal transition process is to create a strategy that leads to economic regeneration of coal mining areas



CONCLUSION

The intent of this note was to provide a knowledge framework for Indian policy makers, companies, civil society, and researchers on coal transitions underway in other countries. Coal transitions have been taking place for over a century driven by technological advancement and economic realities. Transitions of the past (Ruhr in Germany and the UK) were messy, complicated processes which often took decades to fructify. This was due to a combination of factors including functional, political, and cognitive lock-ins. In other words, factors like regional specialised supply chains that impeded growth of other industries, resistance from local communities and mining companies, state policies and subsidies that protected and aided uncompetitive businesses, lack of foresight on economic and financial decline, top-down decision and fractured decision-making processes, impeded the transition process. This resulted widespread, decades-long unemployment, economic decline of these areas, outward migration, and feelings of betrayal and mistrust amongst impacted communities. The unplanned nature of these transitions also meant that environment remediation and land reclamation of degraded coal sites lacked funding which impacted investments of new industries in the region.

Ongoing climate-backed coal transitions sought to avoid the fallouts of past transition processes by pre-empting coal phaseout planning. Keeping differences in political framework aside, some of the key components of preparing the strategy roadmap being used by different countries include defining affected parties, quantifying the financial, economic, and social cost of the transition, identifying funding sources, creating a governance structure, and engaging in social dialogue and coalitions. The end goal of the coal transition process is to create a strategy that leads to economic regeneration of coal mining areas. Examples from global coal transitions as well as other transition literature (EBRD, 2020) prove that re-inventing a region based on its inherited



capabilities, i.e., existing knowledge, skills and institutions helps in successful development of new industries. These ideas have been integrated within the 'Smart Specialisation' strategy developed by the European Union since 2009 and have been the central condition to access regional funds since 2014. This strategy has been applied to over 150 regions in Europe and the Latrobe valley in Australia. It avoids the pitfalls of one-size-fits-all solution making, by following a place and evidence-based approach to allocating resources and creating capacity for new specialities based on underlying strength and potential of the region which helps bring about structural changes (Wiseman, Workman, Fastenrath, & Jotzo, 2020). The Ruhr region is a prime example of this strategy where the authorities harnessed the natural latent talent in the field of energy efficiency, renewable and environmental technologies – which had been used to serve the coal and steel industries – to become one of the key centres for these industries. Gippsland in the Latrobe Valley followed a similar path to identify four new industries for exploration - Food and Fibre, New Energy, the Visitor Economy, and Health and Wellbeing (Wiseman, Workman, Fastenrath, & Jotzo, 2020). In isolated regions (Head of the Valleys in South Wales) where it has been difficult to manage to attract new investments, countries have adopted a 'managed retreat' which has seen resulted in outward migration and relocation.

However, it will be difficult to translate the just transition approach as it stands to developing economies due to the high incidence of the informal economy. As discussed above, most countries do not have accurate estimates of the number of informal workers involved in mining. Moreover, the prevalence of a large informal economy points to problems in quality of labour in terms of education and skills. These characteristics imply that socio-economic profiling will be a necessity in developing countries to transition the labour force to better quality clean jobs. South Africa forms a useful template for developing countries in terms of the approach being taken to frame the Just transition discussion. However, the uniqueness of developing countries in terms of their coal economy, the just transition strategy has to be localised and context specific.

It is obvious that India cannot directly adopt the processes being undertaken in Europe and the US, given the political economy of coal in the country. In India, there may be no single 'decision' to phase coal out, and even if some such public commitment is made, it will mostly lag the beginning of the actual phase-out transition - as is indeed already happening. This makes it important to begin planning for such a transition even without a formal decision on coal phase-out if we are to avoid the fallout of an unplanned transition as seen in Ruhr, UK and several other parts of Europe. Although here as well, India differs, given these countries and regions were facing deindustrialisation and India needs to remain on the growth path to fulfil her development goals. Thirdly, the cultural diversity and difference in social and economic indicators, sometimes even between different districts, complicates India's transition pathway. Therefore, while global debates can afford pointers on approaches, India will have to chart its own 'just transition' pathway.

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ANNEXURES

ANNEXURE I

A summary of funds from the MFF 2021-2027 which are earmarked or can be used for to fund the coal transition in the European Union.

Source: (Widuto, 2019) and figures and objectives from (European Commission, 2021)

Summary of funds from MFF 2021-2027 for coal transition activities			
Fund Name	Objective	Budget (billion euros)	Thematic areas
European Social Fund+	Supports the shift to clean transition by promoting employment and social inclusion through improvement in education, training, reskilling and up-skilling.	98.5	Green Transition, Human Capital, Economic Diversification, Digital Transition
Cohesion Fund	Aimed at Member States whose Gross National Income (GNI) per inhabitant is less than 90 % of the EU average. To reduce economic and social disparity between EU countries and promote sustainable development	48	Green Transition, Human Capital, Economic Diversification, Digital Transition
European Regional Development Fund	Supports the shift to a low-carbon economy. Specific actions include promoting the production and distribution of renewable energy sources, supporting energy efficiency in public buildings and in the housing sector, promoting low-carbon strategies, adoption of low-carbon technologies, investments in adaptation to climate change, and industrial transition towards a resource-efficient economy	226	Green Transition, Human Capital, Economic Diversification, Digital Transition
European Globalisation Adjustment Fund (EGF)	This fund will help reintegrate workers who have lost their jobs due to globalisation into the labour market. It usually comes into play when entire companies are shut down or when a large number of workers are laid off in a particular sector, in one or more neighbouring regions	0.19	Human Capital
Technical Support Instrument	The technical support is provided in a wide range of policy areas, including but not limited to climate action, digital transition, and health.	0.86	Green Transition
Horizon Europe	Largest EU research and innovation programme. 35 % of resources dedicated to climate-related research	95.51	Green transition, Human Capital, Digital Transition
Research Fund for Coal and Steel	Supports research and innovation projects in the areas of coal and steel. Every year around €40 million is made available to universities, research centres and private companies to fund projects	0.04	
InvestEU	To carry out investments in sustainable infrastructure, research and innovation and digitisation, small and medium-sized enterprises and mid-caps, social investment, and skills, across the EU.	10.28	Economic diversification via investments

Summary of funds from MFF 2021-2027 for coal transition activities

Fund Name	Objective	Budget (billion euros)	Thematic areas
Life Programme	To achieve the shift towards a sustainable, circular, energy-efficient, renewable-energy-based, climate neutral and resilient economy; protect, restore, and improve the quality of the environment; halt and reverse biodiversity loss, and to tackle the degradation of ecosystems.	5.43	Green Transition
Reform Support Programme	Offers financial and technical assistance for structural reform, including in the areas of climate action and energy		
Just Transition Fund	To support the transition towards climate neutrality by alleviating the socioeconomic impacts of the transition in the regions most affected.	19.32	Green Transition
Connecting Europe Facility	To accelerate investments in Europe's transport, energy, and digital infrastructure networks. To support the twin green and digital transitions, by contributing to the ambitious infrastructure targets for the European Green Deal and the digital decade.	20.7	Green Transition, transport, and digital infrastructure

ANNEXURE 2

10-POINT RECOMMENDATION BY THE CANADA JUST TRANSITION TASK FORCE

1. "Develop, communicate, implement, monitor, evaluate and publicly report on a just transition plan for the coal phase-out, championed by a lead minister to oversee and report on progress."
2. "Include provisions for just transition in federal environmental and labour legislation and regulations, as well as relevant intergovernmental agreements."
3. "Establish a targeted, long-term research fund for studying the impact of the coal phase-out and the transition to a low-carbon economy."
4. "Fund the establishment and operation of locally driven transition centers in affected coal communities."
5. "Create a pension bridging program for workers who will retire earlier than planned due to the coal phase-out."
6. "Create a detailed and publicly available inventory with labor market information pertaining to coal workers, such as skills profiles, demographics, locations, and current and potential employers."
7. "Create a comprehensive funding program for workers staying in the labor market to address their needs across the stages of securing a new job, including income support, education and skills building, re-employment, and mobility."
8. "Identify, prioritize and fund local infrastructure projects in affected communities."
9. "Establish a dedicated, comprehensive, inclusive and flexible just transition funding program for affected communities."
10. "Meet directly with affected communities to learn about their local priorities, and to connect them with federal programs that could support their goals."



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