



# Real People, Real Change Strategies for just energy transitions

**GSI REPORT**



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## Real People, Real Change – Strategies for just energy transitions

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## Executive Summary

Energy transitions are about people—workers, consumers, businesses, communities, taxpayers and voters—who make decisions that lead to transitions and are ultimately affected by them. The world has seen many transitions in the past, from automation to the decline or relocation of entire industries that led to job losses and the economic decline of regions. This has created a fear of future transitions being similarly painful.

Low-carbon energy transitions are already happening in many countries, often due to economic factors or health concerns, but also supported and accelerated by climate change policies. Nevertheless, the actors involved, including governments, businesses, workers and communities, have a tendency to protect the status quo and keep carbon-intensive industries alive. Inaction can be costly. Experiences with past transitions have shown that prolonging the lifetime of declining industries often leads to subsidies, higher costs for worker retraining and unemployment, health and environmental costs, and missed opportunities for the diversification of an economy.

Early action on a just transition can minimize the negative impacts and maximize positive opportunities. The Paris Agreement on climate change includes a just transition as an important principle. A just transition is not a fixed set of rules, but a vision and a process based on dialogue and a tripartite agenda shared by workers, industry and governments that needs to be negotiated and implemented in its geographical, political, cultural and social context. It is implemented with a set of guiding principles, such as the *Guidelines for a Just Transition* of the International Labour Organization.

Energy transitions can seem daunting, making it difficult to act early. This report aims to support governments of both developed and developing countries in their endeavour to make energy transitions just. It brings together political and communications strategies for a just transition, building on research and case studies of energy transitions that have happened or that are happening in Canada, Egypt, Indonesia, India, Poland and Ukraine.

### “The How-To”: Strategies for just energy transitions

**Understanding the context.** A political economy analysis will reveal who can be potential champions and allies, and who might be opposed to a process. It should include the interests and influence of actors, as well as “soft” and “hard” context factors. This includes resource endowments, the economic situation of regions, but also the sense of identity and belonging that is provided by locally anchored industries. Analyzing the impacts of an energy transition—especially on jobs and economic development—by projecting both positive and negative impacts will be key to addressing them. For example, Ukraine is planning to develop social and environmental mitigation plans for each coal mine to be closed and programs for social rehabilitation of regions. Affected groups and communities should be involved as much as possible. Canada included visits to every affected community as part of its just transition process.

**Identifying Champions.** Having trusted champions who can advocate for a just energy transition in the national or local context is key. They can come from within government, but also public or civil society organizations. For instance, high-level support from the Prime Minister and the Minister of Environment in Canada led to an excellent composition of the Just Transition Task Force. Social dialogue and tripartism between workers, employers and governments can build support and lead to better policies. Recently, the governments of Canada, Germany and Spain have set up such dialogues.

**Making the case.** A transition, or moving *away* from something, is often perceived as threatening. Communicating in a credible way about the reasons for and benefits of transitions, and being forthright about the challenges, is key to building support and finding well-adapted solutions. Listening and social dialogue are essential. Ghana conducted stakeholder consultations alongside its fuel pricing reforms in 2013.



Arguments should resonate with the belief system of people, based on a thorough understanding of concerns and attitudes. Egypt’s government used coherent communications strategies that resonated with the belief systems of Egyptians and the demands of the Arab Spring protests. Articulating a positive objective such as economic diversification and improvement to health helps build public support. Indonesia showed the massive development benefits to explain the need for subsidy reforms. Tangible benefits, for example through measures that create jobs in the short term, can build trust.

**Implementing just transition measures.** Managing impacts is at the heart of every just transition. Responses range from measures that do not require dedicated funding, such as long timelines that are clearly communicated and allow people and industries to adjust, to active labour market policies, skills development and retraining, public sector policies for job creation, industrial policies for economic diversification and support for community renewal. In countries with functioning social protection systems, many of these measures will be delivered from existing or reinforced safety nets. Additional funding could be mobilized through earmarking taxes on energy, reallocating fossil fuel subsidies, tapping existing funding mechanisms, working with the private sector or through setting up a dedicated just transition fund. The strong involvement of trade unions and communities will lead to better policies and increased social acceptance. Enhancing job opportunities by developing new emerging sectors can mitigate negative impacts and reinforce positive developments. For example, the renewable energy sector in India is already estimated to have created 432,000 jobs. Setting the frameworks so that new sectors generate stable and well-paying employment can contribute to an energy transition.

## Next Steps: Acting early to minimize negative impacts and maximize positive opportunities

Much can be done to support just transition processes. Table E1 gives examples of how countries can initiate or support them. Acting early can make energy transitions less costly and more just. The goal is not a hypothetical “perfect” just transition. Real change needs frank and inclusive discussions, and action with and for real people to address challenges and maximize opportunities.

**Table E1. Steps to initiate or support just transition processes.**

|                                       |  |
|---------------------------------------|--|
| Understanding the context             | <ul style="list-style-type: none"> <li>• Map the political economy of an energy transition</li> <li>• Use detailed analyses of positive and negative impacts of an energy transition (at national, regional or even plant level)</li> </ul>  |
| Identifying champions                 | <ul style="list-style-type: none"> <li>• Facilitate international and regional exchange and peer learning between countries at different stages of energy transition processes, including engagement with labour, businesses, civil society, especially for developing country contexts</li> <li>• Round tables at the country level to start or enhance a conversation on a just transition between all concerned stakeholders</li> <li>• High-level dialogue between countries in similar situations to promote the idea of a just transition at the highest levels of government (e.g., at the EU, OECD or G20 level or bilaterally)</li> </ul> |
| Making the case                       | <ul style="list-style-type: none"> <li>• Develop communications strategies for just energy transitions</li> <li>• Set up inclusive processes for “two-way communications”</li> <li>• Train government officials in communications</li> </ul>   |
| Implementing just transition measures | <ul style="list-style-type: none"> <li>• Promote localized green jobs, including in decentralized energy and energy efficiency, and link this explicitly to the energy transition</li> <li>• Mobilize additional funding to promote visible and tangible just transition measures, and communicate about the benefits</li> <li>• Share best practices of just transition measures</li> </ul>   |



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## 1.0 Just Energy Transitions—Action needed for people and the climate

Energy transitions are about people—workers, consumers, businesses, communities, taxpayers and voters—who make decisions that lead to transitions, and people are affected by them (Stanley Foundation 2017, Labour Network for Sustainability n.d.). The world has seen many transitions in the past, from automation to the decline or relocation of entire industries that led to job losses and the economic decline of regions. The decline of coal mining in Europe, even though it was not initially linked to climate change mitigation policies, is one such prominent example (Bridle, Kitson, Duan, Sánchez & Merrill, 2017). This has created the fear of future transitions being similarly painful.

Low-carbon energy transitions are already happening in many countries, often due to economic factors or health concerns, but also supported and accelerated by climate change policies. Most experts consider a low-carbon energy transition to be inevitable (International Renewable Energy Agency [IRENA], 2018b; OECD/IEA & IRENA, 2017). There is still some uncertainty about the pace of an energy transition and its potential to disrupt incumbent technologies and fossil fuel dependent economies (Fattouh, Poudineh & West 2018).

Nevertheless, the actors involved, including governments, businesses, workers and communities, have a tendency to protect the status quo and keep carbon-intensive industries alive at high cost, even though its future prospects, and sometimes even its present economics, are negative. This path-dependency of institutions and technology that prevents changes has been described as “carbon lock-in” (Unruh, 2000). By developing new perspectives for and with those who stand to lose, just transition policies can overcome an initial opposition and create new alliances for climate action. Governments, together with social partners and civil society, have a key role to play to make transitions just. Just transition policies can therefore support the implementation of climate policies, in addition to their main intention of minimizing negative impacts and maximizing opportunities.

### Acting Early Is Needed

Inaction can be costly. Experiences with past transitions have shown that prolonging the lifetime of declining industries instead of proactively supporting alternatives can lead to high costs in the short, medium and long terms. This includes ongoing financial support to these industries, costs for worker retraining and unemployment benefits, as well as health and environmental costs, that add to the opportunity cost of delaying the diversification of an economy. By acting early, and anticipating and addressing changes, better and more just outcomes can be achieved.

A just transition is based on the idea that recognizing challenges and addressing them head-on can lead to much better outcomes than doing nothing, or waiting too long. Early action on a just transition can minimize the negative and maximize positive impacts. Acting early can give people and industries time to prepare for and respond to changes. Proactive support for communities and workers, in close cooperation with companies, can provide support and new opportunities to those who stand to lose.

So far, most examples of just transition approaches come from industrialized countries. Developing countries often face additional challenges, such as smaller public budgets and less access to a social protection system. This does not mean that the just transition concept is not relevant for these countries—much to the contrary. But the requirements and needs in these countries might be different, just as the strategies for a just transition might not be exactly identical. In particular, while the need for preparedness, consultation and communication is the same, the financing requirements and potential sources of funding might be different.

This report aims to support governments of both developed and developing countries in their endeavour to make energy transitions just. Energy transitions can seem daunting, making it difficult to act early. They require balancing diverging interests and building consensus. There is much to learn—both in positive and negative ways—from the many energy and technological transitions that happened historically.



This report brings together ideas for how a just transition can be addressed, highlighting strategies that can be used throughout the process, ranging from understanding the context, identifying champions and making the case to finally implementing just transition measures. The paper is more focused on the “how” or the political and communications strategies, than the “what”, i.e., the concrete measures that need to be identified for a specific context. It builds on case studies of energy transitions that have happened or that are happening in Canada, Egypt, Indonesia, India, Poland and Ukraine. Many of the strategies and lessons learned are also highly relevant to non-government stakeholders that are involved in just transition discussions, particularly labour representatives and representatives of affected communities and NGOs.

## What Is a Just Transition?

There is no blueprint for a just transition. A just transition is not a fixed set of rules, but a vision and a process that needs to be negotiated and implemented in its geographical, political, cultural and social context. What is seen as just in one instance can be seen as unjust in another (Krause & Roth, 2018). Implementing a just transition in countries with low access to social protection systems and high dependence on fossil fuel production is more challenging than for those with functioning social protection and diversified economies (Hirsch, Matthes & Fünfgelt, 2017).

A just transition is therefore implemented with a set of guiding principles, such as the *Guidelines for a Just Transition* (ILO 2015). This approach is taken by many stakeholders, for example the Just Transition Centre of the International Confederation of Trade Unions (Just Transition Centre 2017), countries such as Canada, Germany and Spain, and the research and NGO community (Hirsch, Matthes & Fünfgelt, 2017). The following definitions will be used for this report.

**Energy transitions** are shifts in the way people produce and consume energy using different technologies and sources. A low-carbon energy transition is a type of energy transition involving a shift from high-carbon energy sources such as oil, gas and coal to low-carbon and zero-carbon energy sources such as renewables.

**A just energy transition** is a negotiated vision and process centred on dialogue, supported by a set of guiding principles, to shift practices in energy production and consumption. It aims to minimize negative impacts on workers and communities with stakes in high-carbon sectors that will wind down, and to maximize positive opportunities for new decent jobs in the low-carbon growth sectors of the future. It strives to ensure that the costs and benefits of the transition are equitably shared.

Jobs are an important part of this transition. Energy transitions often involve a restructuring of economies and labour markets, and some sectors will witness a contraction and others an expansion in employment. The International Labour Organization (ILO) estimates that progress toward sustainability in the energy sector will create around 18 million more jobs globally by 2030 when compared to business-as-usual (ILO, 2018). So far, these jobs have been unequally distributed. IRENA (2018a) estimates that of the more than 10 million people employed in the renewable energy sector in 2017, 43 per cent were located in China, and very few in Africa. The location of new jobs will depend on existing comparative advantages of regions, as well as dedicated policies.





## The International Evolution of the Just Transition Concept

Internationally, the labour and environmental movements have been the first to advocate the need for a just transition in the context of climate change policy (Just Transition Centre, 2017; Stanley Foundation, 2017). The principles and imperatives of a just transition were codified in the *Guidelines for a Just Transition Towards Environmentally Sustainable Economies and Societies for All* published by the International Labour Organization (ILO) (2015). They were developed in a tripartite process between governments, business and worker organizations as a practical orientation to governments and social partners.

The just transition idea has received increasing attention in the planning and negotiation of phase-outs of coal production and consumption and other high-carbon practices (Gerasimchuk et al., 2018). As a result, “just transition” conversations have become very dynamic—and sometimes heated. The preamble of the Paris Agreement on climate change includes “the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities” as important principles (United Nations Framework Convention on Climate Change [UNFCCC], 2015). Climate negotiators (UNFCCC Secretariat, 2016), businesses (The B Team, 2016), investors (Robins, Brunsting & Wood 2018) and various intergovernmental organizations started becoming more active in the just transition space.

In 2018, the Talanoa Dialogue under the United Nations Framework Convention on Climate Change received a large number of submissions requesting a just transition for the workforce and other social groups (UNFCCC Secretariat, 2018). In addition, there are calls for the G20 to embrace the just transition agenda to foster social dialogue and broad-based energy transition (Just Transition Center, 2017; Climate Action Network, 2018). The UNFCCC’s Improved Forum on Response Measures—a body charged with considering the impacts on other states of measures taken to address climate change—has a mandate to focus on “just transition of the workforce, and the creation of decent work and quality jobs” (UNFCCC, Decision 11/CP.21, paragraph 5).

In the context of the UNFCCC and other international bodies, the definition of just transition has a distinctly international element. That is, just as an energy transition will have an uneven distribution of costs and benefits within a country, it will also affect countries differently. This discussion therefore focuses on international efforts to manage negative impacts between countries. This international element, while it is critical to a smooth energy transition, is beyond the scope of this paper, which focuses on the challenge of just transition at the national level.



## 2.0 “The How-To”: Strategies for just energy transitions

Low-carbon energy transitions can take place in many different forms, from phasing out coal to reducing the carbon intensity of the electricity system and implementing energy efficiency standards in buildings. Each country will need to define its own energy transition or transitions. Once that endpoint is defined, especially if the goal is to transition *away* from a technology, there will be questions about how to implement this transition and how to make it just.

While there is no universal “recipe” for how to implement just energy transitions, given their complexity and differences in local context, there are a number of political and communications strategies that can be adapted and used. This chapter brings together experiences from past energy transitions, including the decline of coal production in many regions (Bridle et al., 2017; Merrill, 2017; Sartor, 2018; Szpor & Ziółkowska, 2018; Vallentin, Wehnert, Schüle, & Mölter, 2016), as well as reforms of fossil fuel subsidies (Beaton et al., 2013), both from the literature and six case studies.

Dialogue and participation to build up trust are central. Workers and communities, along with the general public, need to understand which changes are happening and why, who might be affected and what can be done in response. They also need to know that their voices are heard, and that there is a commitment to a managed and just transition, the nature of which they have some input in shaping. Workers and other social groups, but also regional governments or companies, can have a high level of distrust due to past experiences with governments or companies that implemented transitions or other policies without their participation or consent (Sartor, 2018).

### 2.1. Understanding the Context

Energy transitions are extremely context-specific and complex. Preparedness is essential, and understanding the context is the first step.

#### Politics Matter—The need for an analysis of the political economy

Analyzing the political economy context—who the stakeholders are and their interests and level of influence in a political process—is often the key. A political economy analysis will reveal who can be potential champions and allies, and who might be opposed to a process.

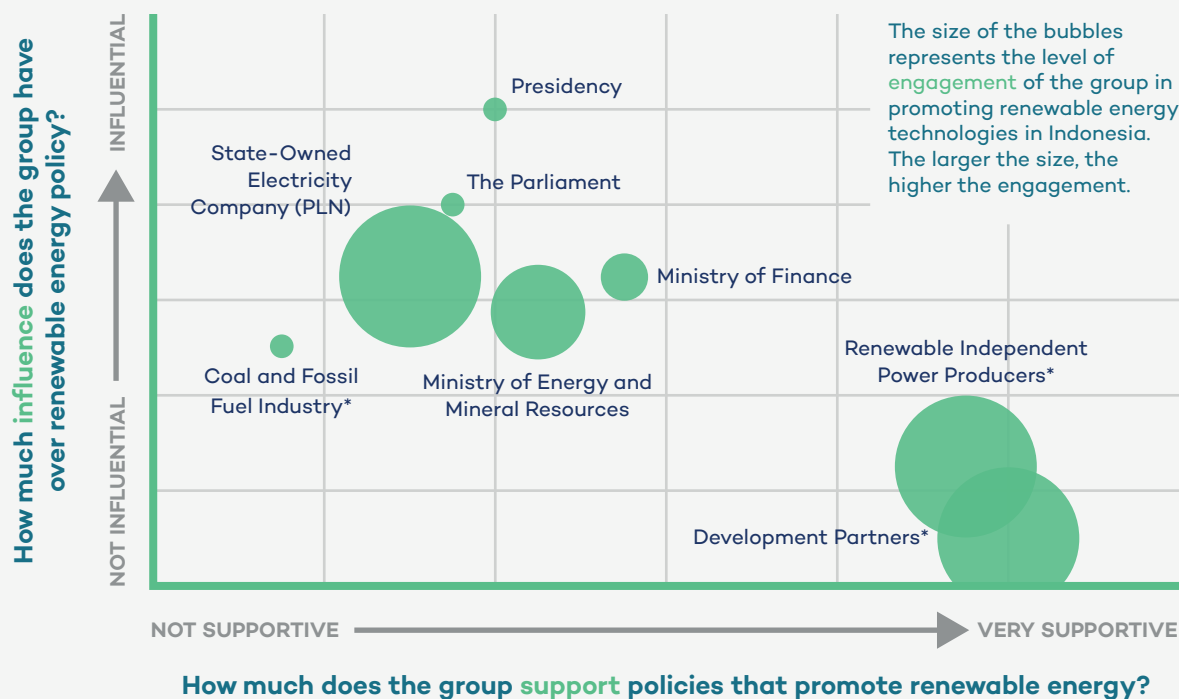


### Box 1. How to do a political economy analysis

To understand the relations between the actors relevant for an energy transition, they can be visualized in an influence–interest–engagement plot based on the assessment of the motivations, ideologies, capabilities, resources and the degree to which the issue at stake is central to their operations (see Figure 1). The assessment is qualitative and subjective but provides a useful tool for understanding the actors and their influence.

This three-dimensional approach allows for identification of which actors are most engaged in policy changes, which have the most influence within the policy-making process and whether they are supportive of a just transition. For example, an actor (such as a head of government) may have a lot of influence and engagement, but if they are not supportive a desired change will not occur. Likewise, if very supportive and engaged actors (e.g., environmental NGOs) are not influential in decision making, changes are not likely. The placement of actors can be done through media reviews, focus group discussions, polling and household surveys, and in-depth interviews with experts.

**Figure 1. Support for renewable energy, level of engagement and influence of stakeholders in Indonesia**



Source: Bridle et al., 2018.



Particularly relevant actors for a just transition and their interests often belong to the groups listed in Table 1. When analyzing the attitudes and concerns of these actors, it is important to identify and take into account other influencing social factors such as gender, class, ethnicity, race and age, to name only a few. The specialized rights of indigenous communities are important in some country contexts. In Canada, Indigenous people have specific constitutional rights that oblige the government to consult with them on policy actions that affect them.

**Table 1. Actors and their relevance for a just energy transition**

| Actor                                  | Role and relevance for a just energy transition   |
|--|---|
| Trade unions and non-unionized workers | As an essential stakeholder in tripartite negotiations, trade unions advocate for the interests of their members and workers more broadly. They might oppose an energy transition if the prospects for workers are negative, but can also become critical supporters of a just transition. In many countries, traditional energy industries provide stable employment with relatively well-paying jobs. In many countries, workers in these industries are highly unionized and have a strong sense of solidarity, whereas employment in the renewables sector might be characterized by lower levels of unionization. Non-unionized workers, including those who have temporary or informal jobs, are also stakeholders and need a representation in designing and implementation of an energy transition. |
| Businesses                             | Businesses in the energy sector, also part of tripartite negotiations, can be opposed to or become allies for a just transition. Companies in the fossil fuel business may fight to keep the status quo, at the risk of foregoing future opportunities and creating stranded assets. It is essential to start early dialogue with businesses, some of which are state-owned. This can also support a diversification of companies. This can also contribute to keeping workers in the workforce, for example through retraining within the same company. Companies in new green sectors can be vocal supporters of a transition, and also provide new—and often localized—employment opportunities.   |
| Political leaders                      | Political leaders have a crucial role not only in policy-making, but also in setting up an institutionalized dialogue with stakeholders and communicating clearly about reforms. For example, high-level commitment in Canada was crucial in securing participation in the Just Transition Task Force. The newly elected presidents of Indonesia and Egypt used their strong political mandate to implement subsidy reforms swiftly, while communicating the reasons and benefits.  |
| Regional governments                   | Regions are often affected by unequally distributed changes across countries, and might oppose changes if negative impacts are not managed. They are a key negotiating partner, with an important role in communications, but also in implementing policies for a just transition.  |
| Administration                         | Staff in ministries or government agencies have a key role in preparing the analysis and developing plans for a just transition. Having these plans already prepared and “in the drawer” is key before starting implementation.   |
| Civil society organizations            | Non-governmental organizations can play a key role in just transition processes. This ranges from being an advocate for environmental or health concerns (and informing the public), to being a mediator, for example with community organizations or religious institutions.   |
| Energy consumers and general public    | Energy transition may be associated with price increases affecting different categories of consumers, including households. Consumer engagement needs different channels of two-way communication, from engagement with consumer associations to campaigns explaining the rationale and benefits of reform to the general public.   |

Source: Authors' summary



In addition, a political economy analysis should take into account both socioeconomic and cultural factors. Resource endowment and the availability of alternative energy sources are crucial factors (Bridle et al., 2017). Phasing out coal is easier in jurisdictions that have little or no commercial coal reserves (California, Ontario) or have considerably depleted them over time (France, Netherlands, South Wales, Spain, mines around Beijing) (Harris, Beck, & Gerasimchuk, 2015; Gass & Gerasimchuk, 2016). In these cases, concerns about energy security and the cost of imports add arguments for a phase-out. But even in countries that still have substantial reserves of an energy source, a factor that comes increasingly into play is the economics of fossil fuels versus renewables. In many countries, including India (Case Study 3), electricity from renewables is becoming more cost-effective than coal-fired electricity, and there is a risk of creating stranded assets in the coal sector. Having substantial resources of renewables provides opportunities to shift energy production, with opportunities for employment and economic development, is a benefit. Nevertheless, these resources are not necessarily in the same region which means that positive and negative impacts are unequally distributed between regions.

Existing industries can have many jobs and communities depending on them. They are also a significant source of local or national tax revenues, even though these might be offset by subsidies. Many coal regions are already structurally weaker, with higher unemployment and fewer alternative economic opportunities (Sartor et al., 2018). The analysis should also consider whether there is already a growing “green” sector which could include activities as diverse as producing renewable energy industry on an industrial scale, providing decentralized renewable energy solutions, retrofitting housing and other energy efficiency measures, or manufacturing renewable energy equipment. Political systems and their functioning are of course central to this analysis and will influence how policies can be made. For example, Germany’s federal system means that its states have a large influence on policy-making.

The analysis should also include a consideration of culture and identity. Industries can shape the character of entire regions and give their inhabitants a strong sense of identity and belonging. Allegiances can also be based on these “historical” bonds, for example between mine workers and specific parties, or local businesses and local or regional governments. Job losses mean more than the loss of income. Jobs often provide a purpose or sense of self that cannot be simply compensated financially. Unemployment can lead to higher levels of substance abuse, depression and suicide.

While the impacts of energy transitions are local, the international context is extremely relevant for just transitions. International climate agreements are often a key motivation for action. They can also help give domestic credibility to policy-makers’ proposals for coal phase-out or other energy transitions. Canada’s engagement on the federal level to phase out coal was justified by its commitment to the Paris Agreement. Green standards of the International Olympic Committee also helped determine cleaner air policies in Beijing. In Ontario, one of the drivers of the coal phase-out was the fact that Canada could be held accountable for cross-border pollution under the Air Quality Agreement with the United States and the North American Free Trade Agreement (Harris, Beck, & Gerasimchuk, 2015).



## What's at Stake? Assessing negative and positive effects of a transition

Impact assessments on employment, the economy or regions can be conducted through a mix of quantitative and qualitative research methods. Affected groups and communities should be involved in this process as much as possible. An impact assessment should identify both negative and positive impacts, so that policies can minimize the negative effects while reinforcing the positive. Examples are presented in the table below.

**Table 2. Impacts of an unmanaged vs. a managed transition**

| Negative impacts of an unmanaged transition                     | Potential positive impacts of a managed transition   |
|---|--|
| Job losses in fossil fuel industries and businesses around them | New jobs in new industries, skills development<br>Possibility to replace dangerous and unhealthy jobs (e.g., in mines) with new and safer employment |
| Economic decline of regions                                     | Economic development and diversification, in affected or other regions   |
| Loss of community culture and identity                          | Potential to “reinvent” regions or communities with new identities   |
| Loss of stable, and strongly unionized jobs                     | Potential to build up labour representation in new industries  |

Source: Authors' summary

Quantitative analysis can project how the existing level of employment would change given a shift in energy technologies (see Annex for information on approaches). Typically, this will include a consideration of direct, indirect and induced jobs (Bacon & Kojima, 2011; IRENA, 2012). Direct jobs are linked to specific energy sector projects, such as project development, construction and operations and maintenance. Indirect jobs are all jobs linked to supplying and managing energy sector projects, such as input materials for construction or quality assurance and regulatory agencies. Induced jobs are created when additional directly and indirectly employed workers spend their income, stimulating demand and therefore employment elsewhere in the economy.

The analysis needs to go beyond the sheer number of jobs created or lost. This includes the question of whether these are “decent jobs”, i.e., the level of salaries, job security, safety and health benefits, but also whether jobs are skilled, semi-skilled or unskilled. New jobs may not be located in the same region or even country, and there may be a time lag for new jobs to be created. For an energy transition, it is also important to take into account the longevity of jobs. Grid-connected solar and wind projects, for example, often involve high levels of short-term employment associated with large upfront investments in infrastructure, and lower levels of long-term employment, as no jobs are required around fuel extraction, refining and distribution (Bacon & Kojima, 2011; IEA, 2017).

In addition, qualitative analysis is important to explore issues that cannot be easily quantified. This might include the quality of work; lived experiences and bottlenecks around unemployment and re-employment; the social and psychological significance of declining sectors to individuals and communities; and viable programs for matching unemployed workers with new opportunities, taking into account factors such as professional skills, geographic location and labour demand in the energy and non-energy sectors. The analysis of historical experiences with sectoral transition is also vital to inform future expectations.

The energy transition may also have important macroeconomic impacts. For example, resource-rich countries that have historically provided low-cost fossil energy to domestic consumers at below-market prices may be unable to transition toward a low-carbon sector without an increase in average energy prices. There is an extensive literature on modelling the negative and positive impacts of energy price increases on households and the economy from the field of fossil fuel subsidy reform. This includes social impact and distributional analysis



with non-dynamic models based on input-output tables and social accounting matrices. Additionally, dynamic, macroeconomic analysis with partial equilibrium and computable general equilibrium (CGE) models can identify feedback loops from changing patterns of government and consumer expenditure (Beaton et al., 2013; Olivier & Ruggeri Laderchi, 2018; Yemtsov & Moubarak, 2018).

- **Map the political economy, including the interests and influence of actors, and “soft” and “hard” context factors.** For example, the close ties between national or regional governments with the coal sector in many countries, mean that coal phase-outs are particularly sensitive.
- **Analyze the impacts of an energy transition by projecting positive and negative impacts using a mix of quantitative and qualitative methods.** For example, Ukraine is planning to develop social and environmental mitigation plans for each coal mine to be closed and programs for social rehabilitation of affected regions.
- **Involve affected groups and communities as much as possible in the research.** Canada included visits to every affected community as part of its just transition process.

## 2.2 Identifying Champions

Trusted champions can advocate for a just energy transition in the national or local context. They can come from within government, but also from public or civil society organizations. Political leadership is essential. In Canada, the commitment of the Trudeau government to work in a Just Transition Task Force was key to getting high-level participation and buy-in. In Egypt, repeated speeches by the president were key to securing the success of difficult subsidy reforms. In Indonesia, President Widodo campaigned on reforms and made them a central part of his election platform. Local government representatives are also crucial to garner support, if they are convinced that their region will receive the support it needs to deal with the negative impacts. By comparison, communication campaigns that appear to be linked to one party or which use politicized television channels as the only channels of communication might delegitimize the entire reform process.

In some cases, demands for a change originate with civil society groups. For example, doctors’ associations are trusted stakeholders and can rally support from the general public around health concerns linked to pollution by coal and other fossil fuels. Business stakeholders, if not completely supportive, must at least be willing to work with the government. For example, in 2012 the Indonesia government reached out to business organizations, among them the Chamber of Commerce and Industry, the Organization of Land Transportation Owners and Islamic organizations. Because of the absence of political consensus, however, reforms eventually failed.

**Building support and better policies through social dialogue and tripartism between workers, employers and governments.** Open processes of dialogue not only garner input that will ultimately strengthen policies, but they also build trust and improve the credibility of the implementing governments. Setting up dedicated institutional processes for social dialogue on a just transition can be a fundamental tool for strengthening democracies and building more social support for change (Rosemberg, 2017). Recently, the governments of Canada, Germany and Spain have set up dialogues that bring together unions, businesses and civil society to foster dialogue and identify solutions. Ghana conducted a wide stakeholder consultation process alongside its fuel pricing reforms in 2013, including not only cabinet and parliamentary subcommittees, but also industry players, consumer groups and civil society (Addo, Bazilian, & Oquah, 2017).

An open dialogue with labour groups, communities, industry associations and other groups affected by a transition will help to identify challenges, and design solutions that are adapted to the needs of—and accepted by—affected communities. The Canadian government, after speaking with labour representatives and local communities, set up a Just Transition Task Force for coal workers and communities with the goal of assisting



workers to transition as coal was phased out and in addressing challenges that communities would face as a result of the transition (Government of Canada, 2018b). The strong participation of labour representatives can not only ensure that the rights of workers are protected, but can also be key in communicating with workers.

**Preparedness and intra-government coordination.** The work of the administration behind the scenes can be at least as important as what is visible to the outside. Most energy transitions are long-term, structural processes, and thus need structural solutions. Preparation is therefore essential and should go hand in hand with coordination across government and levels of government. For example, coordination and coherent policy implementation was key to reforming USD 21 billion annually worth of energy subsidies in Egypt. The tense political situation required the simultaneous implementation of social protection measures and communication to succeed.

- **Identify national champions for a just transition.** High-level support from the Prime Minister and the Minister of Environment in Canada led to an excellent composition of the Just Transition Task Force.
- **Use social dialogue and tripartism to build trust, improve credibility and identify solutions.** The strong role of trade unions led to the formulation of policies in Poland and Ukraine.
- **Ensure close coordination between government departments and levels of government.** In Egypt, a coordinated approach across government helped to reform USD 21 billion worth of subsidies per year.

## 2.3 Making the Case

Gaining or regaining the trust of workers, communities and businesses is crucial for just transition processes. A transition, or moving *away* from something, is often perceived as threatening. People often appreciate the idea of continuity more than disruptive changes. This report is not advocating for merely providing a positive “spin” to something that is difficult. It rather wants to point out the benefits of leading inclusive communications processes, and explaining changes in a way that resonates with people. Communicating in a credible way about the reasons for and benefits of transitions—and being forthright about the challenges—is key to building support and finding well-adapted solutions. A good communications strategy can then improve effectiveness (through better policies and programs), responsiveness (by better taking into account the needs of workers and affected communities), and accountability (by explaining policies and their impact) (Beaton et al., 2013).

Especially in the context of climate change policies, it is essential to go beyond greenhouse gas mitigation benefits to explain the need for changes and find examples much closer to people’s daily lives. Lobbyists sometimes fuel opposition against a transition to resist or delay changes. In some cases, these groups deliberately chose to pitch workers against environmentalists, thereby creating a false “jobs vs. environment” narrative (Rosemberg, 2017). In surveys and focus groups, people consistently rejected language that called for a direct transition from fossil fuels to renewables, and claiming that the skills in one industry could be directly transferred to another (Marshall, Bennett & Clarke, 2018). The following points are important for communications as part of energy transitions.

**Listening as an essential part of the strategy.** An open dialogue with labour groups, communities, industry associations and other interested parties will help identify challenges and responses while helping to reduce opposition. Such a two-way process can achieve public buy-in for measures that in many countries are affecting, directly or indirectly, the social contract between state and citizen (Moerenhout et al. 2017). For example, Ghana conducted and publicized a wide stakeholder consultation process alongside its fuel pricing reforms in 2013. This exercise was intended not only to share information, but also to try and mitigate indirect price rises that often follow fuel price increases. The National Petroleum Agency drove the consultations that included cabinet and parliamentary subcommittees, but also industry players, consumer groups and civil society (Addo





et al., 2017). Consultations should start early. For example, in Malaysia, a communication campaign was only launched when reforms were well under way (Bergaoui, 2016). The government was then criticized for not having made public consultations beforehand (Palatine, 2014).

**Understanding concerns and attitudes of different stakeholders.** Better understanding concerns and attitudes will also be crucial to “speak the right language” and communicate via the most effective communication channels. It is important that new information resonates with the existing belief systems of people (Finnemore & Sikkink, 2005). A person’s reaction to later information is influenced by exposure to prior information, a phenomenon called “priming” in social justification theory (Stanchi, 2010). Explanations need to build upon the consistent and repeated use of vocabulary that fits into the existing systems of stakeholders. This reduces dissonance and makes change appear less abrupt and more probable, thereby reducing status quo bias. One interesting example is Morocco’s gradual move toward the liberalization of fuel prices between 2012 and 2014. During this time, teams working on the technical aspects of reform were frequently in touch with policy-makers to ensure consistent communication (ESMAP, 2017). In Indonesia, in preparation to the 2005 reforms, government officials received media training and briefing instructions to ascertain consistency in messaging (Beaton et al., 2017).

**Communicating in a transparent and credible way.** Hiding negative impacts does not pay off in the long run. Being honest about challenges, while stressing the positive, builds trust and a shared understanding. It is important to be clear about the need to phase out—and its inevitability: there needs to be a clear and credible signal about the negative aspects of continuing with business-as-usual, and of the political will to change course. In Jordan, Prime Minister Abdullah Ensour became very involved with the 2012 energy subsidy reforms. Besides emphasizing an expensive package of compensation measures, he also stressed that unity within Jordan society was needed to successfully implement reforms and revive the economy. He recognized hardship, but also stressed that delaying reforms would erode domestic stability. With political instability in Syria on the rise, this message struck a realistic note in an otherwise often politicized debate (Moerenhout et al., 2017).

**Going beyond climate change concerns.** While a country’s responsibility to contribute to the fight against global warming combined with international climate change commitments are important, in most cases it will be important to go beyond them. A frequent argument against the phase-out of fossil fuels is that the contribution of a specific domestic fossil fuel industry is responsible for just a tiny share of global or national greenhouse gas emissions, and that this cannot justify job losses with massive consequences for workers and families in one specific community. Communication campaigns are more effective when they are able to show harm linked to a particular cause. Many academic and policy analysts have found that the success of transnational networks and advocacy coalitions depend, among others, on the presence of direct physical harm to innocent and vulnerable people (Keck & Sikkink, 1998: 27). Appealing to empathy increases the chances of stakeholders internalizing the need for a change (Blasi & Jost, 2006). Air pollution and its negative health implications are often critical concerns in both developed and developing countries. Health and local pollution concerns have been very prominent drivers of coal phase-out in Beijing and Ontario. Arguments can also include the inevitable decline of a certain fossil fuel technology in a country, for example due to cost-competitive other technologies, and the impacts on workers and communities if nothing is done.

**Articulating a positive objective.** The transition is not the goal, but the means to a better future. Greenhouse gas reductions are an important policy goal, but not something that inspires people in their daily lives. Climate communications experts strongly recommend focusing messages on where the transition leads to (e.g., decent jobs in new industries, a cleaner environment) rather than what it moves away from (e.g., from existing coal, oil or gas industries) (Marshall, Bennett & Clarke 2018; Climate Access, 2018). Language about diversifying, rebuilding, restructuring or evolving was better received than the language about fast transitions (Marshall, Bennett & Clarke 2018). Focusing on positive outcomes such as economic diversification and improvement to health through reduced air pollution helps build public support for transition. For example, in India there is



an excellent opportunity to focus on the development of a thriving domestic renewable energy sector and its employment opportunities, while working with coal companies, unions and regions to reduce the share of coal in a just manner.

**Tangible results.** Communications need to go beyond a narrative and be backed up by “hard facts,” i.e., immediate results that show the benefits of a transition. People demand concrete outcomes that improve their lives in tangible, meaningful ways. As positive effects often take longer timelines to materialize, it can be important to consider measures that can demonstrate impact in the short term. There also needs to be a clear focus on how negative impacts will be reduced and addressed and how workers and communities will be involved in the process. Field research by communication advisors at Climate Outreach in Alberta, Canada and Wales in the United Kingdom found common distrust in government and environmentalists’ claims about the replacement of high-carbon employment with abstract “green jobs” (Marshall & Darnton, 2012; Marshall, 2014, Marshall, Bennett & Clarke 2018). Specific examples of green jobs are preferable to hypothetical estimates and numbers in government communications (Climate Access, 2018). In visual communications, the emphasis has to be on individual or easily relatable people rather than images of politicians, protestors or equipment.

- **Make listening and social dialogue essential parts of communication strategies for a just energy transition.** Ghana conducted a wide stakeholder consultation process with industry players, consumer groups and civil society alongside its fuel pricing reforms in 2013.
- **Speak the right language that resonates with the belief system of people, based on a thorough understanding of the concerns and attitudes.** Egypt’s government used coherent communications strategies that resonated with the belief systems of Egyptians and the demands of the Arab Spring protests.
- **Communicate in a frank and transparent way, and be clear about the need to phase out while presenting a positive long-term goal.** Clarity on the need to phase out coal in power production, combined with a clear commitment to consider and address negative impacts on workers and communities, was key in getting buy-in for Canada’s Just Transition Task Force. In Indonesia and Egypt, the presidents included the announcement for subsidy reforms in their successful election campaigns.
- **Show tangible benefits of a transition, for example through measures that create jobs in the short term.** Indonesia’s government used a positive narrative around development benefits to explain the need for subsidy reforms and reinvested the savings. Egypt implemented social policies with immediately visible results, especially for poor households, financed by a USD 15 billion support package. India has an excellent opportunity to develop a positive narrative for an energy transition and job opportunities while phasing out coal.



## 2.4 Complementary Policies—Implementing just transition measures

Managing impacts is at the heart of every just transition. Responses range from measures that do not require dedicated funding—such as long timelines that are clearly communicated and allow people and industries to adjust—to industrial policies that help facilitate a transition into new sectors of economic activity, or dedicated funding schemes to support regions and workers.

### What Can Be Done? Measures to manage impacts

Government interventions can reduce the negative impacts of an energy transition and reinforce or even create positive impacts. Resource and other constraints mean that it may not be possible to avoid all negative impacts. Consultative processes can then help to prioritize the most urgent measures and build consensus around them. Examples of measures that can be used for a just transition are presented in Table 3, based on multiple sources (Rosemberg, 2017; Bridle, Kitson, Duan, Sánchez, & Merrill, 2017; Harris et al., 2015; Sartor, 2018; Szpor & Ziółkowska, 2018).

The speed of a transition often determines the need to deploy dedicated measures. Given the urgency of moving away from costly or polluting technologies, this means acting as early as possible. Long lead times with clearly communicated timelines make it easier to adapt to changes. Even though some energy transitions might be perceived as a challenge by established businesses, setting clear timelines early on provides a possibility to adapt. For example, Coal India Limited, the coal mining company that employs around 300,000 workers, is starting to diversify its operations. By ensuring absorption and retraining of existing employees, the company could play an important role in easing the transition away from coal in India (Case Study 3).

**Table 3. Measures to manage negative impacts**

| Measure  | Examples   | Desired impact   |
|--|--|--|
| Macroeconomic and structural policies (long-term)              | <ul style="list-style-type: none"> <li>• Diversifying the economy and businesses</li> <li>• Removing barriers to renewable energy or energy efficiency</li> </ul>  | <ul style="list-style-type: none"> <li>• Attracting investment to affected regions</li> <li>• “Related diversification” by developing economic activities that are related to existing industries</li> </ul>   |
| Public sector policies for job creation (short to medium term) | <ul style="list-style-type: none"> <li>• Public procurement, sustainable infrastructure projects, public regulations</li> </ul>  | <ul style="list-style-type: none"> <li>• Stimulating job growth in regions that will face job declines</li> <li>• Fighting the “environment vs. jobs” narrative</li> </ul>   |
| Active Labour Market Policies                                  | <ul style="list-style-type: none"> <li>• Employment services, providing information and matching services</li> <li>• Early retirement schemes</li> </ul>   | <ul style="list-style-type: none"> <li>• Support unemployed workers and workers at risk of unemployment</li> <li>• Retain income and purchasing power in the affected areas</li> </ul>   |
| Skills development and retraining                              | <ul style="list-style-type: none"> <li>• On-the-job-training in companies</li> <li>• Training courses</li> <li>• Relocation expenses and assistance</li> </ul>   | <ul style="list-style-type: none"> <li>• Support the redeployment of workers in stable and well-paying employment</li> <li>• Create income opportunities for workers and their families</li> </ul>   |
| Social protection  | <ul style="list-style-type: none"> <li>• Social security systems, unemployment benefits, retirement</li> </ul>   | <ul style="list-style-type: none"> <li>• Reduce the negative impact of job losses, provide income support to families</li> </ul>   |
| Community renewal and regional economic diversification        | <ul style="list-style-type: none"> <li>• Provide funding for community projects</li> <li>• Support to regions based on an assessment of their potential strengths</li> <li>• Building up local entrepreneurial networks</li> </ul> | <ul style="list-style-type: none"> <li>• Help anticipate losses in revenue and economic activity in communities that are highly dependent on fossil fuel-related work sites</li> <li>• Make regions more attractive and create a sense of belonging</li> </ul> |



## Where's the Money? Funding for just transition policies

In countries with functioning social protection systems, many of these measures will be delivered from existing or reinforced systems, or in cooperation with companies that provide retraining and other services, and do not require additional funding. Here the challenge is reallocation to or strengthening of existing systems. In countries where social safety nets are weak or non-existent, the question of mobilizing resources to support a just transition is even more acute. Mobilizing additional funding for specific just transition measures can be needed if existing systems cannot cope with the change, based on an impact analysis. Additional funding can also be used as part of a negotiation to mobilize support or unblock resistance to an energy transition. The question of whether there is a responsibility to provide extra funding for a just transition cannot be solved in this paper.

In many cases, waiting to address the impacts of a transition or trying to delay it can be much more costly than adapting to or harnessing it. In Ukraine, financial support to the ailing coal sector peaked in 2015, when it amounted to 3.8 per cent of total budget outlays (see Ukraine case study). Not acting on a transition can also lead to higher health care costs for mine workers working in hard conditions, costs for restoring damaged ecosystems, or opportunity costs for a delayed diversification (see also Sartor et al., 2018). The following presents examples for potential sources of funding for just transition measures.

**Earmarking taxes on energy.** Taxes on fossil fuels or carbon can raise revenues that could be used to fund just transition measures. India collected USD 12 billion in revenue over FY2010–2018 in the form of a tax on coal production. India charges a tax (“cess”) on the dispatch of coal and lignite that currently translates to a carbon price of around USD 2 per tonne of carbon dioxide. In 2010–2017, India partially used revenues from this tax to cover the viability gap for renewable energy technologies. (Gerasimchuk, et al., 2018). In 2017, the European Commission agreed to revise its Emissions Trading System Directive to allow for some of the funds raised by the auction or sale of emissions certificates to be used for just transition measures, and it established a Coal Regions in Transition Platform (IndustryAll, 2017; European Commission, 2017).

In 1972, the state government of Kentucky introduced the coal severance tax on coal production to help pay for diversification away from coal. Between 1972 and 1992, USD 2.7 billion was collected; however, only 7.6 per cent was spent in coalfield counties. Since 1992, about one third of severance tax funds have been distributed through the Local Government Economic Development Fund. This fund distributes grants to coal-producing counties to assist them in diversifying their local economies and to support community development. Projects included technology incubators, training programs, entrepreneurship, public service provision and infrastructure investment (Bridle et al., 2017).

**Reallocating fossil fuel subsidies.** Reforming subsidies and reallocating the benefits is one very elegant and logical option to finance a just transition (Gass & Echeverria, 2017). By reforming fossil fuel subsidies, there is a dual benefit in that economically and environmentally unsustainable financial supports are removed, while fiscal space is created that can then be invested in areas that support transition. This can include investments in communities or infrastructure, as well as direct financial supports for workers. Fiscal space can also be used to invest in the social safety net, which will be critical for those facing unemployment as a result of transition.

**Tapping existing funding mechanisms.** The RESTART program in the Czech Republic is using a mix of state budgets and EU funding to support three former coal regions that are lagging economically. The program aims to mobilise or redirect funds from existing funding mechanisms to these regions and estimates that about 30 per cent of funds are additional (Just Transition Platform, n.d.).

**Working with the private sector.** Germany's phase-out of hard coal in 2007 was negotiated with the mining company RAG, as well as trade unions and the state governments of North Rhine-Westphalia and Saarland. Capital of the company was used to establish the RAG foundation, which is tasked with covering the costs (“eternity costs”) for environmental damages and restoration of mines.



**Setting up a dedicated just transition fund.** The central government of China earmarked CNY 100 billion (USD 15 billion) to deal directly with the layoffs in the coal and steel sectors in 2016–2018, assisting workers affected by efforts to reduce overcapacity (Lim, Miller, & Stanway, 2016). The central government funds are expected to be complemented by provinces, while China’s state-owned enterprises are also involved in facilitating workers’ transition (Bridle et al., 2017). However, there is an ongoing debate in China on whether these funds are adequate for the scale of the layoffs, estimated at 5–6 million state workers over two to three years (Lim, Miller, & Stanway, 2016; Bridle et al., 2017).

- **Use just transition measures to mitigate the negative impacts, and maximize positive impacts, where social systems are not enough.** The strong role of trade unions led to the formulation of socially acceptable policies for staff reductions in the coal sector, for example through voluntary approaches and “golden handshakes” in Poland and Ukraine.
- **Increase job opportunities by developing new emerging sectors.** India has a great potential to support green jobs training, also in collaboration with coal companies, and support localized industries—including decentralized renewables—that can counterbalance a loss of jobs and industries in coal regions.
- **Use consultative processes to engage affected workers and communities into decision making about allocation of resources, where possible.** In Canada’s Just Transition Task Force, stakeholders affected by a coal phase-out are formulating recommendations for response measures, bringing together decision-makers from labour, NGO, business and regions.
- **Mobilize dedicated funding for just transition measures,** for example through savings from fossil fuel subsidy reform, environmental taxes or external funding mechanisms.



## 3.0 Country Experiences With Energy Transitions

These examples are set in countries that differ greatly in terms of their energy systems, resource endowments, economic situations and governance systems. They were chosen to present a wide range of examples, including positive or more difficult experiences, and transitions at different stages, as all these transitions can yield important lessons.

### Poland: Coal sector transformation and just transition measures to support ex-miners

A coal phase-out was never an explicit policy goal in Poland; nevertheless, a sector reform has been ongoing since the end of the 1990s. Closure of coal mines has been performed largely in an attempt to curb inherent sector inefficiency. Historically, coal played a prominent role in the country's energy sector: it was the basis for Poland's industrialization and is still viewed today as a warrant of the country's energy independence. In 2016, coal accounted for about 50 per cent of Poland's energy supply and 16 per cent of its final energy consumption. Although the importance of renewable energy sources is gradually increasing, coal is still a primary energy source for electricity and heat production, accounting for 80 per cent and 86 per cent respectively (IEA, 2018).

Difficult geological conditions—especially ever-increasing depth of coal extraction and worsening coal quality (high level of sulphur and ashes)—are the main reasons for the low productivity of hard coal mines in Poland compared to Indonesia, Australia, Russia, Colombia or South Africa (IEA, 2016). At the end of the communist era, most of the mines suffered from over-production and high labour costs. The restructuring of coal mining started in the 1990s and by 2014, 40 out of 70 mines were closed leading to contraction of production from 150 to 70 million tonnes per year. In 2016, seven additional mines were scheduled for liquidation through an agreement between the European Commission and the government of Poland (Szpor & Ziółkowska, 2018).

#### Impacts: Three quarters of overall jobs lost since 1990, while high subsidies persist

Transformation of the coal sector resulted in a massive decline in employment. The number of miners shrank to almost a quarter of previous levels—from 388,000 in 1990 to around 98,000 miners in 2015. About 85 per cent of the reduction in employment took place prior to 2002, that is before support measures were effective.

The coal sector received significant government support from the beginning of the coal restructuring process in 1990s (CEPS, 2015). According to the IEA (2011), government support measures amounted to EUR 390 million (PLN 170 million) in 1990 and dropped to EUR 92 million (PLN 400 million) by 2009–10. After joining the EU in 2004, subsidies to the coal sector were restricted to certain measures to comply with EU state aid rules. These covered safety risks at closed mines, costs associated with mines liquidation, allowances for retired employees, and free coal and other payments to redundant miners (CEPS, 2015). Overall, IEA (2016) reports that Poland allocated USD 507 million (PLN 1.6 billion) to the coal sector to cover exceptional costs in the period from 2011 to 2014.

#### Context: A state-controlled sector with strong unions

The coal sector in Poland remains largely under state control, either directly or through state-owned energy companies, leaving little space for market transformations. Coal miners are highly unionized, and coal mining trade unions are among the most powerful labour organizations in Poland. These factors make government decisions over the coal sector politically sensitive and challenging (Baran, Lewandowski, Szpor, & Witajewski-Baltvilks, 2018; IISD, 2018).



## Champions: Government and unions negotiating support to coal miners

The Polish government is a key actor in the coal sector transformation, particularly the minister responsible for coal mining. Through its control of coal assets, its financial support to the coal sector and its policies, the government has a significant impact on the sector. Trade unions and the management of energy companies were involved in negotiating policy arrangements to mitigate negative consequences of coal mine closure. The Solidarity trade union gained its power in the 1970s and 1980s, driving democratic transformation in Poland and has become one of the strongest actors in the process of coal sector transformation. Regional governments became important players in the process of transformation after decentralization in 1999, which helped address certain environmental and social issues more effectively (Szpor & Ziółkowska, 2018).

Environmental groups trying to create social and political pressure and increase awareness of climate change issues became important advocates for a low-carbon energy transition (CEPS, 2015).

## Case for Reform: The slow decline of coal and EU policies

As the coal sector became unprofitable at the end of the 1980s due to soaring production costs and the low quality of coal, the urgent need to improve sector efficiency was the main driver for launching sector restructuring program (Baran et al., 2018).

Another important factor driving the transformation of the Polish energy sector externally is membership in the EU since 2004. This resulted in a transposition of European legislation onto national laws. Although Poland did not support the EU 2050 Roadmap to a low-carbon economy, EU-wide policies have played an important role in fostering a low-carbon transition in Poland in the last 10 to 15 years (CEPS, 2015).

## Complementary Policies: From golden handshakes to reviving mining communes

In the period from 1990 to 1995 employment was mainly reduced through a hiring freeze. Mitigation measures were mostly focused on mine workers whose jobs were threatened due to planned closure of coal mines, and compensation allowances were not high enough to attract many miners. However, this approach turned out to be insufficient to address the more ambitious goals of a new restructuring program adopted in 1998.

The Mining Social Package introduced in 1998 adopted a different approach: voluntary layoffs were offered to a much broader group of miners and the associated financial support was much higher. It included several instruments, particularly, miners' leave to incentivize early retirement, one-time unconditional redundancy payment (known as the "golden handshake"), welfare allowance and retraining courses. Overall, these incentives were effective in reducing mining employment by 67,000 workers (Szpor & Ziółkowska, 2018). However, these financial support measures turned out to be costly for the government, rising up to 0.75 per cent of GDP. Still, they were not very effective in terms of keeping ex-miners in the labour market (Baran, et al., 2018).

Another instrument provided special privileges for mining communes. The communes were supported by additional tax revenue through an increased percentage of the personal income tax, preferential loans and special conditions for the acquisition of mining companies' property which could be used for economic activity. Though there are several positive examples of transformation of former mining areas to modern business centres, a comprehensive evaluation of the effectiveness of these privileges for mining communes is not available (Szpor & Ziółkowska, 2018).

Overall, although expensive, the various social support measures helped address many of the negative impacts of the reduction in mining jobs. They also illustrated the importance of social dialogue in mitigating negative consequences of transition (CEPS, 2015). About 100,000 workers are currently directly employed in coal mining, and roughly three times this number of employees are involved in associated sectors. Hence, government decisions on sector restructuring have considerable social implications at the national and regional levels and remain politically challenging to implement (IEA, 2016).





## Conclusion: Close collaboration with trade unions and communes

The involvement of influential trade unions in the process of designing and negotiating instruments of the Mining Social Package turned out to be a crucial factor for implementation of a large-scale employment reduction program without significant social unrest. In addition, a voluntary approach to incentivize job reductions proved to be successful—and even exceeded expected results slightly in terms of reduced mining employment and improved labour productivity (Szpor & Ziółkowska, 2018).

Further, policy intervention at the regional level to support mining communes proved to be also important for mitigating the social consequences of coal sector restructuring. However, successful examples such as Gliwice demonstrate that these interventions can be phased out in communities with strong social resources and local actors (authorities, universities, NGOs) with adequate capacities to take effective steps for transformation at the local level (Szpor & Ziółkowska, 2018).

### Enabling factors

- Involvement of trade unions in designing and negotiating support measures
- Voluntary approach for reducing mine worker jobs
- Policy intervention at the regional level to support mining communes



## India: A coal transition in the making? Developing prospects for 1.2 million coal workers

India's energy sector is at a crossroads. In its Nationally Determined Contribution (NDC), India has committed to reduce the carbon intensity of its GDP by 33 to 35 per cent by 2030 from 2005 levels (GoI, 2015). At the same time, the central government's three-year action plan has proposed increasing coal production to 1 billion tonnes by FY20 (NITI Aayog, 2017). In FY18, 79 per cent of India's total electricity generation was from thermal power plants (CEA, 2018). The high dependence on coal-based power generation has been driven by its accessibility and affordability, but the balance is fast tilting in favour of clean energy. The massive expansion of renewable energy in the country in a short time frame indicates a transition is underway.

### Impacts: Coal sector workers will be affected

Reducing the share of coal in the power sector would have far-reaching consequences for employment, coal mining regions, businesses and tax revenues. In FY18, total coal supply in India, including imports, was around 900 million tonnes, of which 676 million tonnes was produced domestically (Coal India Limited [CIL], 2018). Two thirds of the coal was consumed by thermal power stations (CEA, 2018).

The government-owned coal mining company (CIL) and its subsidiaries control over 80 per cent of coal production. Together they have close to 300,000 employees as of March 2018, plus 128,846 contractual employees, who may themselves employ labourers informally (CIL, 2018; Lahiri-Dutt, 2016). Nationally, formal and informal employment in these companies—along with labour linked to private and illegal, informal coal production—has been estimated at 1,210,000 labourers (Lahiri-Dutt, 2016). Lowering dependence on coal would impact the livelihoods of workers in the sector and their dependents, as well as of businesses close to the mines. A recent shutdown of a polluting thermal power plant in New Delhi saw around 450 contract workers left jobless (The Wire, 2018).

Most of the coal resources are located in the eastern and central states of Jharkhand, Odisha, Chhattisgarh, West Bengal and Madhya Pradesh (Geological Survey of India, 2018). In comparison, most of the planned new renewable energy capacity is concentrated in southern, western and northern regions of India. While solar and biomass can be deployed in almost all states, wind energy is concentrated in a few states in southern and western India (NITI Aayog, 2015). This geographical disparity means that some regions might face a net loss of jobs in the transition away from coal if no measures are used to counter this.

### Context: A soaring renewables sector with employment benefits

The present government set an ambitious target of installing 175 GW of renewable energy capacity by 2022 (NITI Aayog, 2015). As a result, renewable energy capacity increased dramatically and in FY18, India added more renewable energy capacity (11,788 MW) than thermal and hydro capacity (5,400 MW). Around 300,000 workers are expected to be employed in the solar and wind energy sectors to meet the 175 GW target (CEEW, NRDC and SCGJ, 2017). According to an IRENA estimate, the renewable energy sector including solar PV, wind power, biogas, biomass, liquid biofuels, solar heating and small hydro already created direct and indirect 432,000 jobs in India in 2017 (IRENA, 2018a).

International literature reviews found that increasing renewables in electricity supply results in net gains in employment (Bacon & Kojima 2011; Blyth et al. 2014; Cameron & Van Der Zwaan 2015; Meyer & Sommer 2014; Wei, Patadia, & Kammen, 2010). The IEA estimates that employment across the project life cycle is comparable across technologies. While renewables tend to create more upfront jobs in construction and manufacturing, thermal generation requires more ongoing employment in operations and fuel supply (IEA, 2017). Therefore, based on the international literature, a transition from coal to renewables in India is likely to have a neutral or positive impact on net employment.



## Champions: A committed government with potential allies in the private sector

The central government has a key role for transitioning toward renewable energy and lowering dependence on coal. To deliver a just transition, the government will need to work with central trade unions that represent coal workers such as Bharatiya Mazdoor Sangh (BMS), Indian National Trade Union Congress (INTUC), All India Trade Union Congress (AITUC) and Hind Mazdoor Sabha (HMS). These unions are vocal in safeguarding the interest of workers and had earlier this year protested government's decision to commercialize coal mines as it could have resulted in lower wages for workers.

Coal India Limited has announced that it will diversify its operations in light of the Paris Agreement and the increasing global focus on clean energy. It has already started developing solar assets and has plans to build 1,000 MW in solar power projects (CIL, 2018). The company is also a proponent of alternative coal technologies, such as coalbed methane and coal mine methane. Through absorption and retraining of existing employees into renewable energy, it can play an important role in the transition. But as a voice for clean coal, it may also lock India in a fossil fuel-driven energy system for a longer time.

Over USD 7 billion was invested in India's clean energy sector in the first half of 2018 (BNEF, 2018). According to Quartz India, half of the world's largest solar power plants are located in India (Quartz, 2018). Involving this emerging sector in discussions will be essential.

## Case for Reform: India as a global renewable energy leader

Renewables are starting to compete with coal. The surge in renewable energy has reduced cost, so that coal is increasingly becoming uncompetitive for power generation. Adaptation of innovative technologies in the renewable energy sector is also helping improve the quality of power supply and making renewable energy more dependable.

There is also a strong environmental and health rationale for reform. The Health Effects Institute (2018) has found that coal is responsible for around 1.3 million deaths per year, largely due to coal power plants. Another study found that eliminating harmful emissions from power plants could save an estimated annual 11 million years of life in India (Gao, et al., 2018). Civil society and citizens have protested against polluting power plants. Recently, the Badarpur thermal power plant in Delhi, declared as the most polluting power plant in the country (CSE, 2015), was permanently shut down after reports declared it inefficient and people living nearby blamed it for causing cancer and tuberculosis (*Times of India*, 2018)

## Complementary Policies: Starting a dialogue on just transition now to lay the foundations

India has a great potential to develop a thriving renewable energy sector with large employment opportunities before or in parallel with the phase-out of coal. The coal sector is already expecting a decline in demand for labour on account of mines investing in automation. Moreover, the depleting resources of open-cast mines in India will compel CIL to shift to underground mining, which will require retraining workers. If coal mines are increasingly uneconomic, there may be more merit in retraining workers for renewable energy jobs. Diversification of coal companies can create employment and reduce financial distress on coal companies. Innovative techniques such as converting collapsed coal mines into floating solar projects as being done in China may also be explored.

Skilling in green jobs is important. India's Council for Green Jobs, founded in 2015, offers over 70 courses oriented toward environment sustainability by private institutions (ILO, 2018). Retraining of present coal sector employees may be done for upcoming green sector job prospects such as the green corridor for transmission of renewable energy.



Regional imbalances of coal-intensive and renewable energy-intensive states need to be addressed. Encouraging new industries and generating employment opportunities in renewable energy or other sectors can support coal-intensive states. Tax breaks or supporting technology hubs can strengthen employment opportunities and help in redirecting downstream businesses of coal mining to cleaner industries. Promoting decentralized renewable energy (DRE) options can create large number of local jobs.

### Conclusion: Huge potential for a positive renewable energy transition accompanied by an inclusive just transition dialogue

India plays a strong role as a leader in renewable energy and important player in international climate negotiations. Along with focusing on a coal phase-out, India could focus on increasing a renewable energy phase-in. This provides a positive goal in line with the ambitions of the Indian government.

There is a chance to address impacts on workers in the coal industry, and on coal-producing regions and communities early on. Involving workers organizations, regions and businesses from both the coal sector and the emerging renewable energy sector in an inclusive dialogue provides opportunities to identify potential positive and negative impacts and identify measures that support a just transition.

In India, the transition is in its early stages and will take decades to fully materialize. Insensitive policies that create big losers and disadvantaged regions result in hostility and resistance that is damaging for communities and counterproductive to the reform of the energy system and achieving climate goals. India has an excellent chance to get ahead of the curve by initiating a dialogue now.

#### Enabling factors

- Develop a positive narrative for an energy transition and job opportunities
- Involve workers organizations, regions and businesses early on in an inclusive dialogue on a just transition
- Develop impact assessments for different scenarios at the regional and national levels, including both job losses and job gains, as well as mitigation measures
- Continue to support green jobs training, also in collaboration with coal companies
- Support localized industries, including decentralized renewables, that can counterbalance a loss of jobs and industries in coal regions



## Canada: A high-level task force for a just transition in the coal power sector

On February 16, 2018 Canada committed to phase out coal-fired electricity by 2030. The intent is that this will contribute to Canada's goal of having 90 per cent of its electricity coming from non-emitting sources by 2030 (Government of Canada, 2018a). The Government of Canada shifted to a Just Transition approach, launching a Task Force on Just Transition for Canadian Coal Power Workers and Communities (Government of Canada, 2018b). This task force, made up of labour, private sector, NGO, academic and local government representatives is mandated to engage with relevant stakeholders, notably the local workers and communities that will be most affected. The task force is intended to collect information on impacts and identify opportunities and funding streams to support workers and communities through the transition. The Government of Canada is then to act on the task force recommendations, which will be made public by early 2019.

### Impacts: Regional impacts on jobs and communities

The full impact of the coal phase-out plan is not yet known. Roughly 42,000 people are employed in the coal industry sector in Canada, both directly and indirectly (Coal Association of Canada, 2017). Some of these jobs may have been lost even without the coal phase-out plan, given the age of Canada's coal-fired power plants, as well as the economics of coal versus natural gas and renewable energy (Canadian Gas Association, n.d.). However, the full impact and the timeline of the phase-out was fully felt only when the detailed phase-out plan was articulated. Communities where coal was a major part of the local economy were concerned about the loss of jobs and potential local negative economic impact. For example, Hanna, Alberta, which is home to a major coal-fired generating station employing 110 people and a coal mine employing another 60 to 80, expressed concerns about the economic downturn they are already facing as a result of the phase-out announcement (CBC, 2017a).

Previous transitions on the provincial level offer some lessons. In Ontario, most of the coal-fired plants were government-owned, and assessments of the phase-out impact on jobs are unclear. Some jobs have been recovered, such as with the coal power plant in Atikokan that was converted to biomass (Ontario Power Generation, n.d.). In Alberta, the government offered private coal-fired electric companies payments in compensation for closing units early to meet the coal phase-out plan (Morgan, 2016).

### Context: Cross-party agreement, but regional fears about the future

A coal phase-out is supported across political lines at the federal level. A Conservative government first introduced national emissions standards on coal in 2011 that would have led to a sharp reduction in coal-based electricity. A new Liberal government strengthened these regulations by putting in place an end date for phase-out by 2030.

Coal in energy generation was already on the decline when the phase-out was decided. Coal has been an important part of Canada's electricity history, but has not been a dominant force, rivalled by hydroelectricity and nuclear power for decades. Currently 66 per cent of Canada's electricity comes from renewable resources and 81 per cent comes from non-emitting sources including nuclear (Natural Resources Canada, 2018). The economics of the electricity sector in Canada indicated that a shift away from coal was likely coming, particularly due to cost-competitive natural gas, and there was little to no new coal-fired generation expansion planned. Carbon pricing that is expected to be launched nationally in 2019 would further increase costs by CAD 50 per tonne of CO<sub>2</sub> in five years (CBC, 2017b).

Nevertheless, in some provinces in the west (Alberta, Saskatchewan) and in eastern Canada (New Brunswick, Nova Scotia) coal is still mined and a critical part of electricity generation. In provinces such as Ontario, coal was recently phased out in favour of lower emitting sources (Tasker, 2016; Harris et al., 2015) This contributed to an overall reduction of emissions from the electricity sector from 118 Mt in 2005 to 79 Mt in 2015 (Government of Canada, 2018c). The impacts on workers and communities are therefore very regionalized.



## Champions: Cross-party support and engaged labour leadership

The government as well as NGOs and academics supported a shift to clean energy for environmental and health reasons. As other fuels for electricity generation were cost-competitive or cheaper than coal, and strong opposition on economical terms did not emerge (Vriens, 2018).

At the international level, Canada is a founding member of the Powering Past Coal Alliance (Global News, 2017), a coalition focused on creating a global shift away from coal-fired electricity toward renewable energy sources. The Alliance now has 74 members, including 28 national governments, 18 sub-national governments and 28 businesses or organizations committed to its declaration (Powering Past Coal Alliance, n.d.a., n.d.b). Several Canadian provinces are also members, including those that are part of the phase-out.

Canadian labour leadership supported the phase-out plan, contingent on the development and mandate of the Task Force to support workers and communities. Canadian labour leadership has supported the concept of Just Transition for roughly the past 20 years. There is nevertheless apprehension at the worker level, which means that it is important for government to work with labour leadership to address their concerns. Some worker organizations support a shift from fossil fuel to renewable energy jobs. The worker-focused organization Iron + Earth has published a Workers' Climate Plan (Iron + Earth, 2016) that proposes: building Canada's renewable energy workforce; manufacturing of renewable energy products; positioning existing sector unions, contractors and developers within the energy sector; and renewable energy technologies and industrial-scale efficiency projects.

## Case for Reform: health concerns and the Paris Agreement

The main arguments for this transition were health and environment related. Health concerns for noncommunicable diseases and other respiratory illnesses were the primary driver of the coal phase-out on a local level, for example in Ontario (Harris et al., 2015). Canada also expects that the coal phase-out will result in 260 avoided premature deaths, 40,000 fewer asthma episodes, and 190,000 fewer days of breathing difficulty and reduced activity—resulting in an economic health benefit estimated at CAD 1.2 billion from 2019 to 2055 Environment and Climate Change Canada (2018). At the federal level, climate change mitigation has been a major driver to achieve Canada's contribution to the Paris Agreement (Ballingall, 2017). It is expected that this phase-out plan will result in reduction of GHG emissions of roughly 16 million tonnes in 2030.

## Complementary Policies: Focus on supporting communities

A strong consideration of impacts on communities and workers of a coal phase-out was highly important. The Task Force is expected to present recommendations for complementary policies to mitigate negative impacts. Some programs and funding for transition already exist in provinces where coal is a major part of the economy, such as the support programs committed by the Alberta Government which include re-employment, retirement bridging, retraining and relocation (Government of Alberta, 2018). For instance, Hanna received CAD 450,000 in 2017 to support economic diversification (Global News, 2017).

The Pan-Canadian Framework on Clean Growth and Climate Change (PCF) (Government of Canada, 2017) also includes various measures to mitigate negative impacts of low-carbon transition. This includes support for research of clean energy technologies, for job skills development, for export of clean energy technologies developed in Canada, and hundreds of millions of dollars for clean technology development and deployment.

## Conclusion: High-Level support and inclusive processes

Setting up a Just Transition Task Force addressed two key points of this phase-out. First, negative impacts on workers and communities affected by the transition would be carefully considered and mitigated. Second, the most important stakeholders (labour, NGO, business) were involved in developing the recommendations for these. The task force brings together prominent individuals from various backgrounds including labour,



environmental groups, industry and government, while also representing the provinces where coal is a major energy source. The task force also visited every affected community to hear their concerns and help formulate recommendations.

The coal phase-out benefited from support from the highest levels of government. The message was carried by the Prime Minister and the Minister of Environment and Climate Change, signifying the high-level commitment to the phase-out plan. This reinforced buy-in from labour leadership and key industry representatives. The importance of meeting Canada's commitment to the Paris Agreement was a key theme of the coal phase-out and the Pan-Canadian Framework (PCF) on Clean Growth and Climate Change.

The Just Transition Task Force can be seen as an initiative to build a coalition for the phase-out among key stakeholders and to prevent strong opposition from arising. So far, while there is apprehension in regions that will be affected, the coal phase-out has proceeded relatively smoothly, especially compared to other measures of the Pan-Canadian Framework, such as carbon pricing (Rabson, 2018). While the full assessment of the coal phase-out implementation plan has yet to be made, so far the results have been positive.

### Enabling factors

- Clear commitment to consider and address negative impacts on workers and communities
- Involvement of affected stakeholders in formulating the recommendations, with excellent composition of the task force bringing together decision-makers from labour, NGO, business and regions
- Inclusive process and listening as a key part of the just transition process, with visits to every affected community
- High-level support from the Prime Minister and Minister of Environment



## Indonesia: Financing development with fossil fuel subsidies

In 2014, Indonesia reformed its subsidies on gasoline and diesel significantly. In the previous decade, Indonesia's fuel subsidies created an enormous burden on the state budget: transport fuel subsidies made up over 10 per cent of all expenditure in most years. (Pradiptyo et al., 2016). The low fuel prices created incentives for overconsumption of fossil fuels and benefited wealthier households. The subsidies also represented a lost opportunity by using large amounts of public funds for subsidies rather than long-term investments in infrastructure to drive economic growth or social assistance to reduce poverty.

Traditionally the price of gasoline and diesel in Indonesia had been subsidized. Fuels were sold to the public at fixed prices lower than international market prices, with the government budget making up the shortfall. Recognizing this lost opportunity for investment in Indonesian development, at the end of December 2014 the newly elected president Joko Widodo (known as Jokowi) introduced major reforms to fossil fuel subsidies. Jokowi had campaigned on this in his election campaign, to the broad support of the Indonesian people. Subsidies to gasoline were removed, except for distribution costs outside of the central islands of Java, Bali and Madura. For diesel, a fixed subsidy of IDR 1,000 per litre was introduced. At the same time, world oil prices plummeted, so there was no price spike for Indonesians. The reforms and the low international oil price at the time resulted in a massive fiscal savings equal to USD 15.6 billion (IDR 211 trillion) or over 10 per cent of state expenditure in 2015.

### Impacts: Potential higher fuel prices for Indonesians, but positive development outcomes in the long-term

Subsidy savings allowed the government to mobilize additional investment in transfers to regions and villages, infrastructure, and human and economic development programs that led to positive development outcomes. Reallocation of transport fuel subsidies is well aligned with Indonesia's mid-term development plan RPJMN 2015–2019.

Based on the GOI's recent four-year report, up to 2018, there have been investment in thousands of kilometres of new roads, bridges, and railway tracks, as well as airports and seaports. Prices for everyday goods declined by 57 per cent due to better air connectivity (Kurnia, 2018). The Ministry of Finance estimates that inequality decreased (reduction in Gini Ratio from 0.34 to 0.32), and poverty percentage in the villages was reduced (14.09 per cent to 13.93 per cent). Up to 2018, USD 12.2 billion (IDR 180 trillion) has been transferred for village funds (*Warta Ekonomi*, 2018). The unemployment rate has also dropped to a record low 5.1 per cent. Although these improvements cannot be attributed to the reallocation with absolute certainty, it is fair to assume that the increased funding to these sectors would have a considerable impact.

### Context: Swift changes from a leader in his “honeymoon” period at a time when energy prices cooperate

In October 2014, Jokowi was sworn in, and by November 2014 he had implemented a reform that removed the subsidies from the prices of gasoline and diesel. In end-December 2014—taking advantage of the fall in international oil prices—this was followed by a decrease in fuel prices. These falling international fuel prices created a great opportunity for the reform to take place. When the subsidies were removed, the price of fuels actually fell, allowing for lower fuel prices for consumers even as the subsidy was removed. This prevented a backlash to the plan.





## Champions: A new government with a strong mandate.

Led by the president, the government was a key champion of this reform, and it is due to Jokowi's swift action in 2014 that it was able to occur. Jokowi had campaigned on his reform plan, and after taking office the new government was instrumental in the implementation of the reforms and communicating their importance and benefits to Indonesians.

Civil society organizations were found to be largely supportive. Nevertheless, some communication challenges on subsidy reform remain. There is still a need to share information and promote discussion on the basic rationale for reform.

## Case for Reform: Economic and social development for Indonesians

The government strongly communicated on all the newly built infrastructures, funding to villages, economic progress, and other benefits of reform, mostly through commercials and social media. This method of communication is most effective among people living in the cities with good access to information and relatively higher levels of education, but less so in rural areas with less access to these channels.

The “one fuel price” policy (*Indonesia Investments*, 2016) was a crucial development for remote areas. This policy is intended to ensure that fuel prices are the same in remote areas as they are in major cities. However, this requires massive investments in infrastructure to support fuel distribution, which is also a subsidy, albeit a more targeted one than the previous regime.

## Complementary Policies: Massive investments in social programs, infrastructure and rural development

Massive programs were implemented together with the reforms. They did not target workers specifically, but stimulated economic growth and rural development. The Revised State Budget 2015 showed marked increases in expenditure in three main areas: economic and social programs, infrastructure and regional transfer funds. Programs on human and economic development financed by ministries received an increase of IDR 148 trillion (USD 10.1 billion). This included village funds, harbours, sea borders, special allocation funds, public works, education, social security, agriculture and health. State-owned enterprises with a focus on infrastructure received a capital injection of IDR 61 trillion (USD 4.5 billion). This targeted air services, sea transport, construction, housing, plantations, financing for small and medium-sized enterprises (SMEs), agriculture, fisheries, shipping, mining, rail, tourism and ports. Regions and villages received an IDR 34 trillion (USD 2.5 billion) increase in transfer funds. This supported food sovereignty, revitalized traditional local markets, improved regional connectivity and supported health services (Pradiptyo et al. 2016).

## Conclusion: Clear announcement and a focus on development benefits help to pass the reforms

Jokowi made energy reform a main topic for his campaign in the 2014 presidential election, so it was widely accepted as part of the actions he would take if elected president, with strong communication on the benefits of reform. In this way, people knew well in advance what to expect if he were elected and gave him a clear mandate. Although some of his policies—including the subsidy reforms—are seen as controversial by the opposition, recent surveys show that he is still enjoying strong public support (Sukmana, 2018). In 2014, the program was intended to gradually remove all fuel subsidies within four years. Although the GOI has been quite active in promoting the result of their programs using various social media channels, more can be done on basic public communications on the benefits of reform to limit potential backlash.

President Jokowi's firm personal commitment to reform was combined with strong public communications efforts centred on a positive narrative about the development benefits of reform. Transparency about the



planned reforms resulted in a strong electoral mandate. Finally, the savings from the removal of subsidies were ultimately reinvested in programs with strong development benefits for Indonesians. Finally, the opportunistic timing at a period when international oil prices were falling allowed for removal of subsidies without a resultant price shock for consumers.

### Enabling factors

- Clear announcement of reforms to seek a political mandate
- Timing when oil prices were falling
- Strong communications efforts centred around the benefits of reform
- Reinvestment of savings into programs with high development benefits



## Egypt: A shared sacrifice to reform USD 21 billion worth of subsidies

In July 2014, Egypt implemented the first broad and deep energy subsidy reform in decades. The government increased prices of transport fuels, kerosene, natural gas, electricity and heavy fuel oil. The only fuel that saw no price increase was LPG (Moerenhout, 2018). The reforms heavily affected all energy users, whether household, commerce or large industry.

**Table 4. Price increases for energy products in Egypt (2014)**

|             |  |
|-------------|--|
| Gasoline    | 78% (gasoline 80)<br>41% (gasoline 92)<br>7% (gasoline 95)   |
| Diesel      | 64%  |
| Kerosene    | 64%  |
| Natural gas | 33–204% (energy-intensive industries)<br>>200% (low users)<br>500% (medium users)<br>700% (high users) |
| HFO         | 50% (cement)<br>30% (bricks, other users)<br>40% (bakeries and food)                                   |
| Electricity | < 50% (low users)<br>+/- 17% (other users)   |

Source: Figures from Moerenhout, 2018.

### Context: Pressure to reform in turbulent post-Arab Spring times

The subsidy reforms took place during politically and economically turbulent times. After ousting President Mubarak in early 2011, President Morsi and his Muslim Brotherhood were removed from power by large popular uprisings supported by the Egyptian army in 2013. The minister of defence, General Sisi, won the 2014 presidential elections. By that time, the country's fiscal-economic crisis had reached unprecedented proportions (Butter, 2013; Paciello, 2013; ERPIC, 2014; James, 2015; Muthuthi, 2014). GDP growth had dropped from 5 per cent pre-Arab Spring to 0.5 per cent in subsequent years, unemployment was on the rise, with 40 per cent of young people out of work, and the budgetary deficit reached nearly 14 per cent of GDP in 2012–13. The country's debt rate surpassed 100 per cent of GDP, and Egypt was at acute risk of defaulting on its debt. By the time of reform, Egypt's energy subsidies cost USD 21 billion or 8.5 per cent of GDP (Griffin, Laursen, & Robertson, 2016).

### Champions: A unified political elite with no opposition

The Sisi government was the champion of these reforms. It was supported by a broad coalition of technocrats, businesses and academics, with the widespread support of large swathes of the population. President Sisi reformed energy subsidies immediately after receiving the electoral mandate for drastic measures with over 90 per cent of the vote (James, 2015). To plan and implement reforms, Sisi relied on a predominantly technocratic cabinet which was universally in favour of energy price increases. This fostered internal governmental coordination, which is often a necessary condition for reform. Furthermore, Sisi could count on support from academics and most parts of businesses and industry. For years, these groups had argued in favour of meaningful subsidy reform (Clarke, 2014). The media were also generally supportive of Sisi's proposed reforms (Marshall, 2015) and both the press and social media reacted in a balanced manner (Clarke, 2014).



Faced with this broad coalition and consensus, opposition was very limited after Sisi's landslide election. The Muslim Brotherhood had been pushed back after the violent crackdown on its members and structures. Some political parties on the left did oppose reform, but mainly on the grounds that they wanted more preparation, particularly with regards to the impact on poorer households (Moerenhout, 2018). Similarly, the wealthy elite did not oppose reforms even though there was a clear direction from the government to target subsidies better. Egypt's wealthy, as well as many parts of the middle class, favoured Sisi's proposed reforms because of a conflict fatigue and consequential desire for order and stability (*The Economist*, 2015). The lower class were not keen on reforms, but still supported Sisi. The most vocal opponents to reform were found in the transport sector (Clarke, 2014). Many drivers, however, were not linked to particular political parties or associations, and the driver's union was fairly weak.<sup>1</sup>

## Case for Reform: A shared sacrifice for a better economic future

Energy pricing reform was presented entirely as part of the painful measures necessary to restore economic opportunity to the country. President Sisi used his (electoral) popularity and asked for “shared sacrifice” of the Egyptian people. By focusing fully on creating a workable economy for all and stressing social equity considerations, the government connected with one of the strongest drivers of the initial Arab Spring protests. Even though many people remained skeptical about the ability of the Government to redistribute and invest savings from the subsidy reforms (El-Katiri & Fattouh, 2015), they believed in Sisi and his agenda to increase Egyptian economic productivity.

## Complementary Policies: “Sharing the burden as best as possible”

As Egypt's social safety net was poorly developed, several measures were implemented before—and explicitly linked to—the energy subsidy reforms. Two stimulus packages in August 2013 and January 2014 that included an increase of the minimum wages in the public sector were financed with a crucial USD 12 billion package from Gulf countries (Muthuthi, 2014). This financial assistance further included USD 3 billion worth of fuel supplies to reduce the fuel shortages that had been so prominent during Morsi's reign (Butter, 2013). The government also extended the food subsidy system to include 20 new products (Clarke, 2014) to reduce concerns about food price increases. As a short-term measure, the government offered free transport in army buses (James, 2015).

At the same time, the government increased taxes on the wealthy and imposed a new capital gains tax on business. This increased the belief that the government was serious about its intention to revive the Egyptian economy while not only targeting the middle class and low-income households.

## Conclusion: Clear announcements combined with social policies and appeal to solidarity

While Egypt's post-revolutionary situation cannot be easily compared to other countries, several elements are important. Clarity and consistency about the urgency of reforms to revive the Egyptian economy were crucial in fostering cohesion both within government and the population. President Sisi had stressed this in his electoral campaign and implemented reforms immediately after winning election by a landslide. By assuring reforms were imminent rather than potential, Sisi addressed plausible status quo biases or the natural reflex not to want any change.

Implementing social policies with immediate effect and tangible results helped reduce the impact of increased energy prices and increase trust in government. A substantial financial support package from Gulf countries was used to this effect. This was paired with communications strategies that explained how energy subsidies disproportionately benefited wealthier households. President Sisi also stressed the responsibility and need for shared sacrifice to repair Egypt's economy, targeting the nationalistic sentiment that had been dominant in the uprisings. The government's messaging strategy strongly addressed the belief systems of middle- and lower-class Egyptians (Moerenhout, 2018) and was in line with the revolution's demands for more socioeconomic justice.

<sup>1</sup> Based on focus group discussions conducted in 2014 by the Global Subsidies Initiative.



### Enabling factors

- Clarity and consistency about the urgency of reforms to revive the Egyptian economy
- Social policies with tangible results, especially for poor households, financed by a USD 15 billion support package
- Coherent communications strategies that resonate with the belief systems of Egyptians and the demands of the Arab Spring protests



## Ukraine: A steady and costly decline of coal—what is happening to workers?

Ukraine has a long tradition of coal extraction and processing stretching back over 200 years. The country never had a target to abandon coal production and use due to political and social concerns. However, a large phase-out of coal has been taking place for the last three decades, largely driven by economic factors. Coal is the most abundant energy resource in Ukraine, but geological conditions are exceptionally difficult, due to the high depth and low thickness of coal seams. This results in high production costs and high safety risks that undermine the competitiveness of the sector (Razumkov Centre, 2003).

Coal extraction peaked in 1976 at 218 million tonnes (roughly 152.6 Mtoe).<sup>2</sup> After large oil and gas deposits were discovered in West Siberia in Russia, a sharp decline of capital investments in mining in the Donbass region in Ukraine followed. Without sufficient resources for technical upgrades and to ensure labour productivity, the coal sector ended up in crisis conditions in the 1980s, which further deteriorated in the 1990s. Sector restructuring started in 1996, but even with improvements the crisis situation persisted (Razumkov Centre, 2003a). Between 1990 to 2016, domestic coal extraction shrank from roughly 87 Mtoe to 23 Mtoe (IEA, 2018). Potentially profitable mines were gradually privatized. Loss-making mines, often with substantially exhausted deposits and difficult geological conditions, were left in state ownership.

Still, the share of coal in Ukraine's total primary energy supply remained largely unchanged at 33–34 per cent due to a decline in overall energy consumption and increase of net coal imports (IEA, 2018). In 2013, private coal mines, which often belong to vertically integrated steel or power producers, delivered roughly 72 per cent of domestically produced coal (NISS, 2014). Military conflict in the east of Ukraine further worsened the situation in the coal sector with many mines being in the conflict region (Savitsky, 2015). As of 2018, 33 out of 102 coal mines are still controlled by the Ukrainian government, and only four of these are profitable (Secretariat of the Cabinet of Ministers, 2018).

### Impacts: Massive job losses and rising unemployment due to coal sector restructuring

In 1992, the coal sector provided 888,000 jobs. Since then, the number of employees was constantly declining due to sector restructuring and liquidation of unprofitable mines (Razumkov Centre, 2003b). As of January 2016, the coal industry employs 122,000 workers, with 51,000 at state-owned mines (Euracoal, 2018).

Social conditions became exceptionally difficult in satellite towns in the east of Ukraine where closed coal mines were the main job providers for most of the population. In 2011, the official unemployment rate in such towns in coal mining and industrially developed Donetsk region was 1.5 to 3 times higher than the average in the same region (Koshechkova, 2014).

### Context: The “black hole” in Ukraine's budget is about to close, while ambitious plans emerge

While the coal sector was not competitive, closure of unprofitable mines was often postponed for social or political reasons. The government provided direct budget support to partially cover operational costs of loss-making mines and finance capital expenditure for decades. This was very costly. Financial support to the coal sector peaked at UAH 15.3 billion in 2013, when it received 3.8 per cent of total budget outlays. It declined to only UAH 2 billion in 2015, when most of the state-owned coal mines became trapped in the territory of military conflict (State Treasury Service, 2016).

<sup>2</sup> Converted using Unit Juggler, <https://www.unitjuggler.com/convert-energy-from-tSKE-to-Mtoe.html?val=218000000>



The government has now decided to slowly reduce reliance on coal. According to Ukraine's energy strategy, the share of coal in the total primary energy supply is expected to drop to 12.5 per cent by 2035. At the same time, renewable energy sources are projected to expand from 4 per cent to 25 per cent. The strategy envisions restructuring of the coal sector, privatizing promising state-owned mines and closing loss-making mines (Cabinet of Ministers of Ukraine, 2017). As a result, subsidies to the coal sector should no longer be needed, effectively closing the “black hole” in the budget. The government aims to limit state support to labour and environmental safety issues (Cabinet of Ministers of Ukraine, 2017).

At the same time, Ukraine's low-carbon emission development strategy (LEDS) adopted in 2018 includes a number of measures that are expected to provide new jobs (Ministry of Ecology and Natural Resources, 2018). For example, it envisions retrofitting of housing stock and the wide application of energy efficiency measures in power and heat generation as well as industrial and agricultural sectors.

### Champions: Support to coal from government and unions

Despite mounting inefficiency and growing state support to keep the sector afloat, the Ministry of Energy and Coal Industry as well as labour unions always believed that the coal sector could become profitable again and recover its crucial role for Ukraine's economy. There are several trade unions in Ukraine, which often acted as main advocates of miners' social rights—organizing strikes to demand timely payment of wages and trying to influence state policy in the coal sector.

The main advocates for the phase-out of coal and transition to renewables have been civil society organizations, particularly the NGO Working Group on Climate Change, while renewable energy associations have been quite successful in lobbying for favourable policy conditions for the development of the renewable energy sector. Studies like the development of scenarios to phase out coal and nuclear energy have fuelled further debate on the possibility of scaling up national ambition on renewable energy transition, required policies and grid infrastructure (Diachuk et al., 2017).

### Case for Reform: An uncompetitive coal sector and EU targets

Economic factors such as high production costs, labour intensity and overall poor competitiveness of Ukraine's coal sector have been the main factors on sector restructuring and phase-out of coal extraction.

As Ukraine became a member of the Energy Community Treaty in September 2010 and signed an Association Agreement with the EU in 2014, it voluntarily took ambitious obligations on the development of renewables and implementation of demanding environmental standards. In particular, the EU's Large Combustion Plants Directive (LCPD) and the Industrial Emissions Directive (IED) entered into effect for the Energy Community members on January 1, 2018. Implementation of both directives will considerably increase operating costs of existing coal power plants and capital expenditures for construction of new ones. This makes coal power plants uncompetitive compared to renewable energy sources (Savitsky, 2018).

### Complementary Policies: Previous failures and promising new plans for ex-miners

While some measures were introduced to create new jobs for ex-miners in times of massive job losses in the energy sector, they were poorly coordinated and underfinanced. Budget funds planned for this purpose were often misused and reallocated to other state programs, so that only 16 per cent of planned expenditures were spent for the period from 1996 to 2000. For the same period, 26,000 new jobs were created, which corresponds to only 6 per cent of the initial target, at the cost of USD 43.2 million USD (UAH 235 million). Still, the cost of these programs was only a fraction of the support provided to the coal mining sector.



However, these new jobs did not resolve the problem of unemployment of ex-miners. Job creation in new facilities and enterprises was implemented without proper assessment of whether these jobs were actually needed, or whether the factory and plant were profitable and competitive (Razumkov Centre, 2003b). The failure to support workers resulted in unemployment and social problems in mining regions (Razumkov Centre, 2003b).

## Conclusion: Potential to restructure the coal sector while developing alternatives

Ukraine's energy sector is likely to face a major transformation in the near future, given the economic trends and demanding environmental and renewable energy obligations under the Energy Community Treaty and Association Agreement with the EU. Embracing and clearly communicating this reality, especially to government agencies and labour unions, instead of trying to preserve a declining and expensive coal sector, can save costs in the short and long terms.

Just transition measures can support this process and are partly already planned. The current energy strategy aims to mitigate negative social consequences through a comprehensive approach, including social support for ex-miners. Social and environmental mitigation plans for each coal mine to be closed and programs for social rehabilitation of affected regions should be developed. These measures will be designed taking into account best international practices and will include redundancy payments, consulting assistance to ex-miners and retraining programs as well as the development of infrastructure, establishment of business hubs and special economic zones in affected regions. Ukraine's government is expecting to receive technical support from international partners to develop and implement these programs (Cabinet of Ministers of Ukraine, 2017).

There are clear benefits in not only transitioning *away* from coal, but explaining that this is a transition to something and showing the tangible benefits. Incentives for job creation through massive scale-up of state energy efficiency programs can mitigate the negative consequences of the energy transition in Ukraine. It is important that transition plans are developed in an open dialogue with mining communities, municipalities, civil society organizations and local business. The European Commission has already expressed its readiness to support Ukraine in closing depleted and dangerous mines (*Evropeyska Pravda*, 2018). The most important task would be ensuring effective and efficient spending of either international aid or national budget funds.

### Potential enabling factors

- Sharing best practice on just transition measures
- Social and environmental mitigation plans for mine closures
- Promoting job creation in other sectors, for example through energy efficiency programs
- Dialogue with mining communities, municipalities, civil society organizations and local business
- Mobilize international aid and domestic budget funds to support economic development and social policies





## 4.0 Next Steps: Acting early to minimize negative impacts and maximize positive opportunities

Acting early can make energy transitions less costly and more just, while opening up new perspectives for countries to develop low-carbon industries. Nevertheless, it is not easy to overcome “carbon lock-in,” and dedicated political and communications strategies are needed to accelerate just energy transitions.

Much can be done to support these processes that are already ongoing or nascent in many countries. The table below brings together concrete steps that countries can take to initiate or accelerate a just energy transition, based on the case studies and the literature. So far, much of the experiences with just transitions come from wealthier countries. It will be crucial to broaden these experiences with more examples from developing countries, and adapt the just transition concept to individual country contexts.

|                                       |  |
|---------------------------------------|--|
| Understanding the context             | <ul style="list-style-type: none"> <li>• Map the political economy of an energy transition</li> <li>• Use detailed analyses of positive and negative impacts of an energy transition (at national, regional or even plant level)</li> </ul>  |
| Identifying champions                 | <ul style="list-style-type: none"> <li>• Facilitate international and regional exchange and peer learning between countries at different stages of energy transition processes, including engagement with labour, businesses, civil society, especially for developing country contexts</li> <li>• Round tables at the country level to start or enhance a conversation on a just transition between all concerned stakeholders</li> <li>• High-level dialogue between countries in similar situations to promote the idea of a just transition at the highest levels of government (e.g., at the EU, OECD or G20 level or bilaterally)</li> </ul> |
| Making the case                       | <ul style="list-style-type: none"> <li>• Develop communications strategies for just energy transitions</li> <li>• Set up inclusive processes for “two-way communications”</li> <li>• Train government officials in communications</li> </ul>   |
| Implementing just transition measures | <ul style="list-style-type: none"> <li>• Promote localized green jobs, including in decentralized energy and energy efficiency, and link this explicitly to the energy transition</li> <li>• Mobilize additional funding to promote visible and tangible just transition measures, and communicate about the benefits</li> <li>• Share best practices of just transition measures</li> </ul>   |



## References

- Addo, S., Bazilian, M. & Oquah, S. (2017). Ghana: Lessons learned, new strategies. In G. Inchauste and D. Victor (eds.), *The political economy of energy subsidy reform*, 95–132. Washington, D.C.: World Bank. Retrieved from <https://openknowledge.worldbank.org/handle/10986/26216>
- Bacon, R. & Kojima, M. (2011). *Issues in estimating the employment generated by energy sector activities*. Washington D.C.: World Bank. Retrieved from <http://siteresources.worldbank.org/EXTENERGY2/Resources/MeasuringEmploymentImpactofEnergySector.pdf>
- Ballingall, A. (2017). Environment minister touts coal phase-out ahead of climate talks in Germany. *Toronto Star*. Retrieved from <https://www.thestar.com/news/canada/2017/11/12/canada-uk-team-up-at-climate-conference-in-push-to-eliminate-coal-power.html>
- Baran, J., Lewandowski, P., Szpor, A., & Witajewski-Baltvilks, J. (2018). *Coal transitions in Poland – Options for a fair and feasible transition for the Polish coal sector*. IDDRI & Climate Strategies. Retrieved from [https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Rapport/20180609\\_ReportCOAL\\_Poland-def.pdf](https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Rapport/20180609_ReportCOAL_Poland-def.pdf)
- Bast, E., Doukas, A., Pickard, S., van de Burg, L., & Whitley, S. (2015). *Empty promises: G20 subsidies to oil, gas and coal production*. Oil Change International. Retrieved from <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9957.pdf>
- Beaton, C., Gerasimchuk, I., Laan, T., Lang, K., Vis-Dunbar, D., & Wooders, P. (2013). *A guidebook to fossil-fuel subsidy reform for policy-makers in Southeast Asia*. Winnipeg: IISD. Retrieved from [https://www.iisd.org/gsi/sites/default/files/ffs\\_guidebook.pdf](https://www.iisd.org/gsi/sites/default/files/ffs_guidebook.pdf)
- Beaton, C., Lontoh, L., & Wai-Poi, M. (2017). Indonesia: Pricing reforms, social assistance, and the importance of perceptions. In G. Inchauste & D. Victor, *The political economy of energy subsidy reform*, 133–208. Washington, D.C.: World Bank. Retrieved from <https://openknowledge.worldbank.org/handle/10986/26216>
- Bergaoui, J. (2016). *Five key lessons from Malaysia's 2014 subsidy reform experience*. Energy Sector Management Assistance Program (ESMAP). Retrieved from <https://www.esmap.org/node/74414>
- Blasi, G. & Jost, J. T. (2006). System justification theory and research: implications for law, legal advocacy, and social justice. *California Law Review* 94(4), 1119–68.
- Bloomberg New Energy Finance (BNEF). (2018, July). *Clean energy investment trends, 2Q 2018*. Retrieved from <https://data.bloomberglp.com/bnef/sites/14/2018/07/BNEF-Clean-Energy-Investment-Trends-1H-2018.pdf>
- Blyth, W., Gross, R., Speirs, J., Sorrell, S., Nicholls, J., Dorgan, A., & Hughes, N. (2014). *Low carbon jobs: The evidence for net job creation from policy support for energy efficiency and renewable energy*. London: UK Energy Research Centre. Retrieved from <http://www.ukerc.ac.uk/publications/low-carbon-jobs-the-evidence-for-net-job-creation-from-policy-support-for-energy-efficiency-and-renewable-energy.html>
- Bridle, R., Kitson, L., Duan, H., Sanchez, L., & Merrill, T. (2017). *At the crossroads : Balancing the financial and social costs of coal transition in China*. Winnipeg: IISD. Retrieved from <https://www.iisd.org/sites/default/files/publications/crossroads-balancing-financial-social-costs-coal-transition-china.pdf>
- Bridle, R., Gass, P., Halimajaya, A., Lontoh, L., McCulloch, N., Petrofsky, E., & Sanchez, L. (2018). *Missing the 23 Per Cent Target: Roadblocks to the development of renewable energy in Indonesia*. Winnipeg/Geneva: International Institute for Sustainable Development. Retrieved from <https://www.iisd.org/sites/default/files/publications/roadblocks-indonesia-renewable-energy.pdf>



- Butter, D. (2013). *Egypt in search of economic direction* (Chatham House briefing paper). Retrieved from [https://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Middle%20East/bp\\_butter1113.pdf](https://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Middle%20East/bp_butter1113.pdf)
- Cabinet of Ministers of Ukraine (2017). *Resolution of the Cabinet of Ministers No 605-p as of 18 August 2017 On the approval of the Energy Strategy of Ukraine "Security, Energy Efficiency, Competitiveness" for the period up to 2035* (in Ukrainian). Retrieved from <https://www.kmu.gov.ua/ua/npas/250250456>
- Cameron, L., & Van Der Zwaan, B. (2015). Employment factors for wind and solar energy technologies: A literature review. *Renewable and Sustainable Energy Reviews* 45.
- Canadian Gas Association. (n.d.). *Gas stats*. Retrieved from <http://www.cga.ca/gas-stats/>
- CBC. (2017a). *Coal town hopes Alberta government grants will help it bounce back*. Retrieved from <https://www.cbc.ca/news/canada/calgary/hanna-coal-alberta-grants-diversification-1.4266241>
- CBC. (2017b). *Liberals provide details of plan for national carbon tax*. Retrieved from <https://www.cbc.ca/news/politics/carbon-price-tax-discussion-paper-1.4120135>
- Central Electricity Authority (CEA). (2018, October). *Annual report 2017–18*. Retrieved from [http://www.cea.nic.in/reports/annual/annualreports/annual\\_report-2018.pdf](http://www.cea.nic.in/reports/annual/annualreports/annual_report-2018.pdf)
- Centre for European Policy Studies (CEPS). (2015). *Climate for Sustainable Growth – Poland case study*. Centre for European Policy Studies. Retrieved from <http://ceps-ech.eu/publication/climate-sustainable-growth-poland-case-study>
- Centre for Science and Environment (CSE). (2015, May). *India's first-ever environmental rating of coal-based power plants finds the sector's performance to be way below global benchmarks*. Retrieved from <https://www.cseindia.org/indias-first-ever-environmental-rating-of-coal-based-power-plants-finds-the-sectors-performance-to-be-way-below-global-benchmarks-5685>
- Clarke, K. (2014). *Egypt's recent subsidy reforms. Energy subsidy country update*. Winnipeg/Geneva: IISD/GSI. Retrieved from [http://www.iisd.org/gsi/sites/default/files/ffs\\_egypt\\_update\\_august\\_2014.pdf](http://www.iisd.org/gsi/sites/default/files/ffs_egypt_update_august_2014.pdf)
- Climate Access. (2018). *Case study: Ready for 100 (Sierra Club)*. Retrieved from <https://climateaccess.org/resource/case-study-ready-100-sierra-club>
- Climate Action Network. (2018). *G20 issue brief: Just transition*. Retrieved from [http://climatenetwork.org/sites/default/files/can\\_g20\\_brief\\_2018\\_just\\_transition\\_1.pdf](http://climatenetwork.org/sites/default/files/can_g20_brief_2018_just_transition_1.pdf)
- Coal Association of Canada. (2017). *Did you know? Facts about Canadian coal*. Retrieved from <https://careersincoal.ca/facts-about-coal/>
- Coal India Limited (CIL). (2018, August). *Sustainability Report 2017-18*. Retrieved from [https://www.coalindia.in/DesktopModules/DocumentList/documents/Sustainability\\_Report\\_2017-18\\_10082018.pdf](https://www.coalindia.in/DesktopModules/DocumentList/documents/Sustainability_Report_2017-18_10082018.pdf)
- Council On Energy, Environment and Water (CEEW), National Research Development Corporation (NRDC) and SCGJ. (2017). *Greening India's workforce*. Retrieved from <http://www.indiaenvironmentportal.org.in/files/file/CEEW%20NRDC%20-%20Greening%20India's%20Workforce%20report.pdf>
- Diachuk, O., Chepeliev, M., Podolets, R., Trypolska, G., Venger, V. Saprykina, T. & Yukhymets, R. (2017). *Transition of Ukraine to the renewable energy by 2050*. Heinrich Boell Foundation Regional Office in Ukraine. Retrieved from [https://ua.boell.org/sites/default/files/transition\\_of\\_ukraine\\_to\\_the\\_renewable\\_energy\\_by\\_2050\\_1.pdf](https://ua.boell.org/sites/default/files/transition_of_ukraine_to_the_renewable_energy_by_2050_1.pdf)
- The Economist*. (2015). *Worse than Mubarak*. Retrieved from <http://www.economist.com/news/middle-east-and-africa/21650160-abdel-fattah-al-sisi-has-restored-order-egypt-great-cost-worse>



*Ekonomichna Pravda*. (2018). Four Ukrainian cities are planning to completely switch to “green” energy (in Ukrainian). Retrieved from <https://www.epravda.com.ua/news/2018/10/1/641139/>

El-Katiri, L., Fattouh, B. (2015, February). *A brief political economy of energy subsidies in the Middle East and North Africa* (OIES Paper: MEP 11). Oxford Institute for Energy Studies. Retrieved from <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2015/02/MEP-11.pdf>

Environment and Climate Change Canada. (2018). *The Government of Canada outlines next steps in clean-energy transition*. Retrieved from <https://www.canada.ca/en/environment-climate-change/news/2018/02/the-government-ofcanadaoutlinesnextstepsinclean-energytransition.html>

Energy Community (n.d.) *LEAP: Introduction*. Retrieved from <https://www.energycommunity.org/default.asp?action=introduction>

Energy Sector Management Assistance Program (ESMAP) (2017). *A phased approach to energy subsidy reform: The Morocco experience*. ESROC Practitioner Exchange Series. Retrieved from [https://www.esmap.org/sites/default/files/Practitioners%20Exchange%20Series%20Morocco\\_v2.pdf](https://www.esmap.org/sites/default/files/Practitioners%20Exchange%20Series%20Morocco_v2.pdf)

Euracoal. (2018). *Overview of the coal sector in Ukraine*. Retrieved from <https://euracoal.eu/info/country-profiles/ukraine/>

European Commission. (2017, December 11). *No region left behind: Launch of the Platform for Coal Regions in Transition*. Retrieved from [http://europa.eu/rapid/press-release\\_IP-17-5165\\_en.htm](http://europa.eu/rapid/press-release_IP-17-5165_en.htm)

European Rim Policy and Investment Council (ERPIC). (2014). *Energy Brief: Egypt’s Al-Sisi addresses energy subsidy issue*. Cyprus: European Rim Policy and Investment Council.

Evropeyska Pravda (2018). *Strategy-2035: The EU is ready to help Ukraine close the dangerous mines* (in Ukrainian). <https://www.eurointegration.com.ua/news/2018/06/22/7083489/>

Fattouh, B., Poudineh, R. & R. West. (2018). *The rise of renewables and energy transition: what adaptation strategy for oil companies and oil-exporting countries?* The Oxford Institute for Energy Studies. Retrieved from <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2018/05/The-rise-of-renewables-and-energy-transition-what-adaptation-strategy-for-oil-companies-and-oil-exporting-countries-MEP-19.pdf>

Finnemore, M. & Sikkink, K.A. (2005). International norm dynamics and political change. *International Organization* 52(4), 881–917. doi:10.1162/002081898550789.

Gao, M., Beig, G., Song, S., Zhang, H., Hu, J., Ying, Q., et al. (2018). The impact of power generation emissions on ambient PM2.5 pollution and human health in China and India (Abstract). *Environment International*, 121, 250–259

Gass, P., & Echeverria, D. (2017). *Fossil fuel subsidy reform and the just transition*. Winnipeg: IISD. Retrieved from <https://www.iisd.org/sites/default/files/publications/fossil-fuel-subsidy-reform-just-transition.pdf>

Gass, P. & Gerasimchuk, I. (2016). *Stories of coal phase-out: Lessons learned for China*. Winnipeg: IISD. Retrieved from <http://www.iisd.org/library/stories-coal-phase-outlessons-learned-china>

Geological Survey of India. (2018, April). *Indian coal and lignite resources–2018*. Retrieved from <https://employee.gsi.gov.in/cs/groups/public/documents/document/b3zp/mjk1/~edisp/dcport1gsigovi295293.pdf>

Gerasimchuk, I., Bassi, A. M., Dominguez Ordonez, C., Doukas, A., Merrill, L., & Whitley, S. (2017). *Zombie energy: Climate benefits of ending subsidies to fossil fuel production*. Winnipeg: IISD. Retrieved from <http://www.iisd.org/sites/default/files/publications/zombie-energy-climate-benefits-ending-subsidies-fossil-fuel-production.pdf>



Gerasimchuk, I., Merrill, L., Bridle, R., Gass, P., Sanchez, L., Kitson, L. & Wooders, P. (2018). *Fossil fuel phase-out and a just transition. Learning from stories of coal phase-outs*. Stories for success for the UNFCCC Talanoa Dialogue. Retrieved from [https://unfccc.int/sites/default/files/resource/69\\_IISD%20Fossil%20fuel%20phase%20out%20and%20just%20transition%2C%20stories%20for%20success.pdf](https://unfccc.int/sites/default/files/resource/69_IISD%20Fossil%20fuel%20phase%20out%20and%20just%20transition%2C%20stories%20for%20success.pdf)

Gerasimchuk, I., Whitley, S., Beaton, C., Bridle, R., Doukas, A., di Paola, M. & Touchette, Y. (2018). *Stories from G20 countries: Shifting public money out of fossil fuels*. Winnipeg: IISD. Retrieved from <https://www.iisd.org/sites/default/files/publications/stories-g20-shifting-public-money-out-fossil-fuels-en.pdf>

*Global News*. (2017). Alberta sets up fund to help communities during coal phase-out transition. Retrieved from <https://globalnews.ca/news/3734827/alberta-sets-up-fund-to-help-communities-during-coal-phase-out-transition/>

Government of Alberta. (2018). *Support for workers affected by coal phase out*. Retrieved from <https://www.alberta.ca/support-for-coal-workers.aspx>

Government of Canada. (2017). *Pan-Canadian Framework on Clean Growth and Climate Change*. Retrieved from <http://publications.gc.ca/site/eng/9.828774/publication.html>

Government of Canada. (2018a). *Taking action to phase out coal power*. Retrieved from <https://www.canada.ca/en/environment-climate-change/news/2017/11/taking-action-to-phase-out-coal-power.html>

Government of Canada. (2018b). *Task force: Just transition for Canadian coal power workers and communities*. Retrieved from <https://www.canada.ca/en/environment-climate-change/services/climate-change/task-force-just-transition.html>

Government of Canada. (2018c). *Technical backgrounder: Proposed federal regulations for electricity sector*. Retrieved from <https://www.canada.ca/en/environment-climate-change/news/2018/02/technical-backgrounder-proposed-federal-regulations-for-electricity-se.html>

Government of India. (2015, October). *India's INDC to UNFCCC*. Retrieved from <http://www4.unfccc.int/ndcregistry/PublishedDocuments/India%20First/INDIA%20INDC%20TO%20UNFCCC.pdf>

Griffin, P., Laursen, T., & Robertson, J. (2016). *Egypt: Guiding reform of energy subsidies long-term* (Policy Research Working Paper 7571). Washington, DC: World Bank. [http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2016/02/19/090224b08419742e/1\\_0/Rendered/PDF/Egypt000guidin00subsidies0long0term.pdf](http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2016/02/19/090224b08419742e/1_0/Rendered/PDF/Egypt000guidin00subsidies0long0term.pdf)

Harris, M., Beck, M., & Gerasimchuk, I. (2015). *The end of coal: Ontario's coal phase-out*. Retrieved from <https://www.iisd.org/sites/default/files/publications/end-of-coal-ontario-coal-phase-out.pdf>

Health Effects Institute. (2018, January). *Burden of disease attributable to major air pollution sources in India*. Retrieved from [https://www.healtheffects.org/system/files/GBD-MAPS-SpecRep21-India-revised\\_0.pdf](https://www.healtheffects.org/system/files/GBD-MAPS-SpecRep21-India-revised_0.pdf)

Hirsch, T., Matthes, M. & J. Fünfgelt. (2017). *Guiding principles & lessons learnt for a just energy transition in the Global South*. Friedrich Ebert Stiftung. Retrieved from <http://library.fes.de/pdf-files/iez/13955.pdf>

International Energy Agency (IEA). (2011). *Energy policies of IEA countries: Poland – 2011 Review*. Paris: IEA.

International Energy Agency. (2016). *Energy policies of IEA countries: Poland – 2016 Review*. Paris: IEA. Retrieved from [https://www.iea.org/publications/freepublications/publication/Energy\\_Policies\\_of\\_IEA\\_Countries\\_Poland\\_2016\\_Review.pdf](https://www.iea.org/publications/freepublications/publication/Energy_Policies_of_IEA_Countries_Poland_2016_Review.pdf)

International Energy Agency. (2017). *International Energy Investment 2017*. Paris: IEA.



- International Energy Agency. (2018). *IEA world energy balances 2018*. Retrieved from <https://webstore.iea.org/world-energy-balances-2018>
- IEA-ETSAP (n.d.). TIMES. Retrieved from <https://iea-etsap.org/index.php/etsap-tools/model-generators/times>
- Indonesia Investments. (2016). One Fuel Price policy Indonesia, higher operational costs Pertamina. Retrieved from <https://www.indonesia-investments.com/news/todays-headlines/one-fuel-price-policy-indonesia-higher-operational-costs-pertamina/item7295>
- IndustryALL. (2017, February 22). *European Parliament votes in favour of a Just Transition fund*. Retrieved from <http://www.industrialunion.org/european-parliament-votes-in-favour-of-a-just-transition-fund>
- International Energy Agency (IEA) (2017). *International Energy Investment 2017*. Paris, IEA/OECD. Retrieved from <https://www.iea.org/publications/wei2017/>
- International Labour Organization (ILO) (2010). *Trends econometric models: A review of the methodology*. Geneva, International Labour Organization. Retrieved from [https://www.ilo.org/wcmsp5/groups/public/---ed\\_emp/---emp\\_elm/---trends/documents/publication/wcms\\_120382.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_elm/---trends/documents/publication/wcms_120382.pdf)
- International Labour Organization. (2015). *Guidelines for a just transition towards environmentally sustainable economies and societies for all*. Geneva: ILO. Retrieved from [https://www.ilo.org/wcmsp5/groups/public/---ed\\_emp/---emp\\_ent/documents/publication/wcms\\_432859.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_432859.pdf)
- International Labour Organization (ILO) (2018a). *Greening with Jobs. World Employment and social outlook 2018*. International Labour Office, Geneva. Retrieved from [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms\\_628654.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_628654.pdf)
- International Renewable Energy Agency. (2012). *Renewable energy jobs: Status, prospects and policies. Biofuels and grid-connected electricity generation*. International Renewable Energy Agency, Abu Dhabi. Retrieved from <https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2012/RenewableEnergyJobs.pdf>
- International Renewable Energy Agency. (2018a). *Renewable energy and jobs: Annual review 2018*. International Renewable Energy Agency, Abu Dhabi. Retrieved from [http://irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA\\_RE\\_Jobs\\_Annual\\_Review\\_2018.pdf](http://irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA_RE_Jobs_Annual_Review_2018.pdf)
- International Renewable Energy Agency. (2018b). *Renewable power generation costs in 2017*. Retrieved from [http://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jan/IRENA\\_2017\\_Power\\_Costs\\_2018.pdf](http://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jan/IRENA_2017_Power_Costs_2018.pdf)
- Iron + Earth. (2016). *Workers Climate Plan*. Retrieved from [http://d3n8a8pro7vhmx.cloudfront.net/themes/5640eaf72213934458000001/attachments/original/1480293178/Iron\\_and\\_Earth-WCP\\_Nov\\_2016\\_vers\\_2.pdf?1480293178](http://d3n8a8pro7vhmx.cloudfront.net/themes/5640eaf72213934458000001/attachments/original/1480293178/Iron_and_Earth-WCP_Nov_2016_vers_2.pdf?1480293178)
- James, L. (2015). *Recent developments in Egypt's fuel subsidy reform process*. Geneva: Global Subsidies Initiative. Retrieved from [https://www.iisd.org/gsi/sites/default/files/ffs\\_egypt\\_lessonslearned.pdf](https://www.iisd.org/gsi/sites/default/files/ffs_egypt_lessonslearned.pdf)
- Jost, J.T., & Banaji, M.R. (1994). The role of stereotyping in system-justification and the production of false consciousness. *British Journal of Social Psychology* 33(1), 1–27. doi:10.1111/j.2044-8309.1994.tb01008.x
- Just Transition Centre. (2017). *Just Transition. A report to the OECD*. Retrieved from <https://www.oecd.org/environment/cc/g20-climate/collapsecontents/Just-Transition-Centre-report-just-transition.pdf>
- Just Transition Platform (n.d.). *RESTART will win the trust of the people if it's stable*. Retrieved from <http://www.just-transition.info/restart-will-win-the-trust-of-the-people-if-its-stable>



Keck, M. E., & Sikkink, K. (1998). *Activists beyond borders: Advocacy networks in international politics* (1st ed.). Ithaca, N.Y: Cornell University Press.

Koshechkova, I. (2014). *Analysis of the negative consequences of coal mines liquidation and proposals on their decommission* (in Ukrainian). Coal of Ukraine.

Krause, D. & Roth, J. (2018). *Just transition(s) and transformative change*. Retrieved from <https://medium.com/just-transitions/krause-roth-c6a82ae44d5b>

Kurnia, T. (2018). 4 Tahun Jokowi-JK, Ini Deretan Infrastruktur yang Dibangun di RI. *Bisnis Liputan6.com*. Retrieved from <https://www.liputan6.com/bisnis/read/3672741/4-tahun-jokowi-jk-ini-deretan-infrastruktur-yang-dibangun-di-ri>

Labour Network for Sustainability. (n.d.) *Just Transition—Just what is it?* Retrieved from <http://www.labor4sustainability.org/uncategorized/just-transition-just-what-is-it/>

Lahiri-Dutt, K. (2016). The diverse worlds of coal in India: Energising the nation, energising livelihoods. *Energy Policy*, 99, 203–213.

Lim, B.K., Miller, M., & Stanway, D. (2016). China plans to lay off millions of state workers: Report. *Huffington Post*. Retrieved from [https://www.huffingtonpost.com/entry/china-lay-off-workers-curb-pollution-us\\_56d5e8c0e4b03260bf78453e](https://www.huffingtonpost.com/entry/china-lay-off-workers-curb-pollution-us_56d5e8c0e4b03260bf78453e)

Maher, T. (n.d.). *A new approach in Australia to just transition*. World Resources Institute. Retrieved from <https://www.wri.org/climate/expert-perspective/new-approach-australia-just-transition>

Marshall, G. (2014). *Hearth and hiraeth: Constructing climate change narratives around national identity*. Oxford: Climate Outreach Information Network. Retrieved from <https://www.climateinformationnetwork.org.uk/cmsfiles/COIN-Hearth-and-Hiraeth.pdf>

Marshall, G. & Darnton, A. (2012). *Sustainable development narratives for Wales: A toolkit for government communications*. Welsh Government.

Marshall, G., Bennett, A. & Clarke, J. (2018). *Communicating climate change and energy in Alberta*. Alberta Narratives Project. Oxford: Climate Outreach Information Network. Retrieved from <https://climateoutreach.org/resources/global-narratives-alberta-narratives-project/>

Marshall, S. (2015). *The Egyptian armed forces and the remaking of an economic empire*. Carnegie Middle East Center. Retrieved from [http://carnegieendowment.org/files/egyptian\\_armed\\_forces.pdf](http://carnegieendowment.org/files/egyptian_armed_forces.pdf)

McKinsey & Company (2017). *Jobs lost, jobs gained: Workforce transitions in a time of automation*. Retrieved from <https://www.mckinsey.com~/media/mckinsey/featured%20insights/future%20of%20organizations/what%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/mgi-jobs-lost-jobs-gained-report-december-6-2017.ashx>

Merrill, T., & Kitson, L. (2017) *The end of coal mining in South Wales: Lessons learned from industrial transformation*. Geneva: GSI. Retrieved from <https://www.iisd.org/sites/default/files/publications/end-of-coal-mining-south-wales-lessons-learned.pdf>

Meyer, I., & Sommer, M.W. (2014). *Employment effects of renewable energy supply*. Vienna. Retrieved from [https://www.wifo.ac.at/bibliothek/archiv/36286/WWWforEurope\\_PP\\_12.pdf](https://www.wifo.ac.at/bibliothek/archiv/36286/WWWforEurope_PP_12.pdf)

Ministry of Ecology and Natural Resources. (2018). *Ukraine 2050 Low Emission Development Strategy*. Retrieved from [https://unfccc.int/sites/default/files/resource/Ukraine\\_LEDs\\_en.pdf](https://unfccc.int/sites/default/files/resource/Ukraine_LEDs_en.pdf)



Moerenhout, T., Vezanis, N. & Westling, C. (2017). *Navigating political hurricanes in the MENA Region: Energy pricing reform in a context of changing social contracts*. New York, NY: Columbia University Center on Global Energy Policy.

Moerenhout, T. (2018). Reforming Egypt's fossil fuel subsidies in the context of a changing social contract. In J. Skovgaard and H. van Asselt (eds.), *The politics of fossil fuel subsidies and their reform*. Cambridge: Cambridge University Press.

Morgan, G. (2016). Alberta to pay three power companies \$1.36 billion to shut their coal-fired plants early. *Financial Post*. Retrieved from <https://business.financialpost.com/commodities/energy/alberta-strikes-1-36-billion-deal-with-coal-companies-as-part-of-plan-to-shut-down-plants-early>

Muthuthi, C. (2014). *African economic outlook: Egypt 2014*. AfDB, OECD, UNDP.

National Renewable Energy Laboratory (NREL). (n.d.). *JEDI: Jobs and Economic Development Impact Models*. Retrieved from <https://www.nrel.gov/analysis/jedi/>

Natural Resources Canada. (2018). *What is electricity?* Retrieved from <https://www.nrcan.gc.ca/energy/facts/electricity/20068>

NISS. (2014). *Priorities and modernisation leverage of the coal industry in Ukraine* (in Ukrainian). National Institute for Strategic Studies, Kyiv. Retrieved from [www.niss.gov.ua/articles/1495/](http://www.niss.gov.ua/articles/1495/)

NITI Aayog. (2015, December). *Report of Expert Group on 175 GW RE by 2022*. Retrieved from [http://niti.gov.in/writereaddata/files/writereaddata/files/document\\_publication/report-175-GW-RE.pdf](http://niti.gov.in/writereaddata/files/writereaddata/files/document_publication/report-175-GW-RE.pdf)

NITI Aayog. (2017, August). *India three year action agenda FY18–FY20*. Retrieved from <http://niti.gov.in/writereaddata/files/coop/IndiaActionPlan.pdf>

Olivier, A. & Ruggeri Laderchi, C. (2018). *Analyzing the incidence of consumer price subsidies and the impact of reform on households — Quantitative analysis* (Energy Subsidy Reform Assessment Framework (ESRAF) Good Practice Note 3). ESMAP Paper. Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/250011530882467380/pdf/ESRAF-note-3-Analyzing-the-Incidence-of-Consumer-Price-Subsidies-and-the-Impact-of-Reform-on-Households-Quantitative.pdf>

Ontario Power Generation. (n.d.). *Atikokan biomass conversion*. Retrieved from <https://www.opg.com/generating-power/thermal/stations/atikokan-station/pages/atikokan-station-biomass-conversion-project.aspx>

Organisation for Economic Co-operation and Development (OECD)/IEA and IRENA. (2017). *Perspectives for the energy transition – Investment needs for a low-carbon energy system*. Paris: OECD/IEA.

Paciello, M. (2013). Economic and social policies in Post-Mubarak Egypt. *Insight Egypt* 3(2).

Palatino, M. (2014). Why Malaysia reduced its fuel subsidy. *The Diplomat*. Retrieved from <https://thediplomat.com/2014/10/why-malaysia-reduced-its-fuel-subsidy/>

Powering Past Coal Alliance. (n.d.a). *Declaration*. Retrieved from <https://poweringpastcoal.org/about/Powering-Past-Coal-Alliance-Declaration>

Powering Past Coal Alliance. (n.d.b). *Members*. Retrieved from <https://poweringpastcoal.org/about/Powering-Past-Coal-Alliance-Members>

Quartz. (2018, May). *India is beating China in the race to build massive solar power projects*. Retrieved from <https://qz.com/india/1283299/in-the-race-to-build-massive-solar-power-projects-india-is-poised-to-beat-china/>





- Pradiptyo, R., Susanto, A., Wirotomo, A., Adisasmita, A., & Beaton, C. (2016). *Financing development with fossil fuel subsidies*. Winnipeg: IISD. Retrieved from <https://www.iisd.org/sites/default/files/publications/financing-development-with-fossil-fuel-subsidies-indonesia.pdf>
- Rabson, M. (2018). Canadians voted for a carbon tax, Trudeau says as provincial blowback grows. *National Post*. Retrieved from <https://nationalpost.com/pmnn/news-pmnn/canada-news-pmnn/feds-on-track-to-impose-carbon-price-on-growing-number-of-provinces-on-jan-1>
- Razumkov Centre. (2003a). *Coal sector of Ukraine: current state and trends against the background of restructuring* (in Ukrainian). [http://old.razumkov.org.ua/additional/analytical\\_report\\_NSD44\\_ukr.pdf](http://old.razumkov.org.ua/additional/analytical_report_NSD44_ukr.pdf)
- Razumkov Centre. (2003b). *Restructuring of the coal sector of Ukraine: Intentions and results* (in Ukrainian). [http://old.razumkov.org.ua/additional/analytical\\_report\\_NSD44\\_ukr.pdf](http://old.razumkov.org.ua/additional/analytical_report_NSD44_ukr.pdf)
- Robins, N., Brunsting, V. & D. Wood. (2018). *Climate change and the Just Transition: A guide for investor action*. The Grantham Research Institute on Climate Change and the Environment & The Initiative on Responsible Investment. Retrieved from <https://www.unpri.org/download?ac=5361>
- Rosemberg, A. (2017). Strengthening just transition policies in international climate governance. *Policy Analysis Brief*, (April), 1–16. Retrieved from <https://www.stanleyfoundation.org/publications/pab/RosembergPABStrengtheningJustTransition417.pdf>
- Sartor, O. (2018). *Implementing coal transitions: Insights from case studies of major coal-consuming economies*. IDDRI and Climate Strategies. IDDRI (France). Retrieved from [https://coaltransitions.files.wordpress.com/2018/09/coal\\_synthesis\\_final.pdf](https://coaltransitions.files.wordpress.com/2018/09/coal_synthesis_final.pdf)
- Savitsky, O. (2015). *Towards the end of the coal age in Ukraine?! A review of the Ukrainian coal sector in the context of the Donbass crisis*. Retrieved from [https://ua.boell.org/sites/default/files/a5\\_web\\_layout\\_kiev\\_boell.pdf](https://ua.boell.org/sites/default/files/a5_web_layout_kiev_boell.pdf)
- Savitsky, O. (2018). Energy Community sets stage for clean energy transition in South-East Europe. *EnergyPost*. Retrieved from <http://energypost.eu/energy-community-sets-stage-for-clean-energy-transition-in-south-east-europe/>
- Secretariat of the Cabinet of Ministers (2018). *Head of Government: we should hear the noise of production in the mines, not knocking of helmets due to wages arrears* (in Ukrainian). Retrieved from <https://www.kmu.gov.ua/ua/news/glava-uryadu-na-shahtah-maye-buti-shum-virobnictva-ne-stuk-kasok-cherez-borgi-po-zarplati>
- Smith, S. (2017). *Just Transition: A report for the OECD*. 1–23. Retrieved from <https://www.oecd.org/environment/cc/g20-climate/collapsecontents/Just-Transition-Centre-report-just-transition.pdf>
- State Treasury Service (2016). *Reports on the Execution of State Budget 2013-2015* (in Ukrainian). Retrieved from <http://www.treasury.gov.ua/main/uk/doccatalog/list?currDir=146477>.
- Stanchi, K. (2010). The power of priming in legal advocacy: Using the science of first impressions to persuade the reader. *Oregon Law Review* 89 (2010), 305–50. Retrieved from <https://www.lwionline.org/sites/default/files/2016-09/12stanchi.pdf>
- Stanley Foundation. (2017). *Setting an international policy agenda for just transitions*. Retrieved from <https://www.stanleyfoundation.org/publications/pdb/SPCCCPDB318.pdf>
- Stavis, D. (2018). *(Re)claiming Just Transition*. Retrieved from [http://www.unrisd.org/unrisd/website/newsview.nsf/\(httpNews\)/B3BF9D082D992D04C125826D004540BB?OpenDocument](http://www.unrisd.org/unrisd/website/newsview.nsf/(httpNews)/B3BF9D082D992D04C125826D004540BB?OpenDocument)



- Sukmana, Y. (2018). Survei Indikator: Jokowi-Ma'ruf 57,7 Persen, Prabowo-Sandiaga 32,3 Persen - Kompas.com. *Kompas*. Retrieved from <https://nasional.kompas.com/read/2018/09/26/14514271/survei-indikator-jokowi-maruf-577-persen-prabowo-sandiaga-323-persen>
- Szpor, A., & Ziółkowska, K. (2018). *The transformation of the Polish coal sector*. Winnipeg: International Institute for Sustainable Development. Retrieved from <https://www.iisd.org/sites/default/files/publications/transformation-polish-coal-sector.pdf>
- Tasker, J.P. (2016). Canada's rejection of coal will clear the air but impact workers and power bills. *CBC*. Retrieved from <https://www.cbc.ca/news/politics/canada-coal-country-mckenna-workers-1.3860764>
- The B Team. (2018). *Just Transition: A business guide*. The B Team and Just Transition Centre. Retrieved from [https://www.ituc-csi.org/IMG/pdf/just\\_transition\\_-\\_a\\_business\\_guide.pdf](https://www.ituc-csi.org/IMG/pdf/just_transition_-_a_business_guide.pdf)
- The Wire*. (2018, November). Contract workers left in the lurch after closure of Badarpur power plant. Retrieved from <https://thewire.in/labour/contract-workers-left-in-the-lurch-after-closure-of-badarpur-power-plant>
- Times of India*. (2018, October). Badarpur thermal plant shut for good. Retrieved from <https://timesofindia.indiatimes.com/city/delhi/badarpur-thermal-plant-shut-for-good/articleshow/66228551.cms>
- United Nations Framework Convention on Climate Change. (2015). *Paris Agreement*. Retrieved from [https://unfccc.int/sites/default/files/english\\_paris\\_agreement.pdf](https://unfccc.int/sites/default/files/english_paris_agreement.pdf)
- UNFCCC Secretariat. (2017). *Just transition of the workforce, and the creation of decent work and quality jobs*. Retrieved from <https://unfccc.int/resource/docs/2016/tp/07.pdf>
- UNFCCC Secretariat. (2018). *Overview of inputs to the Talanoa Dialogue*. Retrieved from [https://img1.wsimg.com/blobby/go/9fc76f74-a749-4eec-9a06-5907e013dbc9/downloads/1cbos7k3c\\_792514.pdf](https://img1.wsimg.com/blobby/go/9fc76f74-a749-4eec-9a06-5907e013dbc9/downloads/1cbos7k3c_792514.pdf)
- Unruh, G. (2000). Understanding carbon lock-in. *Energy Policy* 28(12), 817–830. Retrieved from [https://is.muni.cz/el/1423/podzim2016/MEB415/um/Unruh\\_Understanding\\_Carbon\\_lock\\_in.pdf](https://is.muni.cz/el/1423/podzim2016/MEB415/um/Unruh_Understanding_Carbon_lock_in.pdf)
- Vallentin, D. D., Wehnert, T., Schüle, D. R., & Mölter, H. (2016). *Strategische Ansätze für die Gestaltung des Strukturwandels in der Lausitz*. Wuppertal.
- Vriens, L. (2018). *The end of coal: Alberta's coal phase-out*. Winnipeg: IISD. Retrieved from <https://www.iisd.org/sites/default/files/publications/alberta-coal-phase-out.pdf>
- Warta Ekonomi*. (2018). Mendes: Penyerapan Dana Desa Capai 99%. Retrieved from <https://www.wartaekonomi.co.id/read200479/mendes-penyerapan-dana-desa-capai-99.html>
- Wei, M., Patadia, S. & Kammen, D.M. (2010). Putting renewables and energy efficiency to work: How many jobs can the clean energy industry generate in the US? *Energy Policy*. Retrieved from [https://rael.berkeley.edu/wp-content/uploads/2015/04/WeiPatadiaKammen\\_CleanEnergyJobs\\_EPolicy2010.pdf](https://rael.berkeley.edu/wp-content/uploads/2015/04/WeiPatadiaKammen_CleanEnergyJobs_EPolicy2010.pdf)
- Yemtsov, R., & Moubarak, A. (2018). *Assessing the readiness of social safety nets to mitigate the impact of reform* (Energy Subsidy Reform Assessment Framework (ESRAF) Good Practice Note 5). ESMAP Paper. Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/180951530884246896/pdf/ESRAF-note-5-Assessing-the-readiness-of-Social-Safety-Nets-to-Mitigate-the-Impact-of-Reform.pdf>



## Annex 1. Quantitative approaches for estimating employment impacts

Standard approaches for estimating the existing level of sectoral employment include bottom-up survey research to identify the level of employment required to manufacture and operate any given energy technology; or a top-down approach, by using input-output tables to identify the average links between outputs from an energy sub-sector and demands on other sectors and labour (Bacon & Kojima, 2011). Surveys are typically used only to identify direct jobs at a project-specific level, while input-output tables can be used at a sectoral level to estimate direct, indirect and induced jobs (Bacon & Kojima, 2011). Such analysis is relevant at all stages of a transition: both before a transition is seriously underway, to help identify baseline data for projecting changes, but also throughout a transition, to gauge the reality of impacts on labour and to ensure that future projections are constantly adjusted in the light of real-world impacts.

Each approach has challenges. Survey research can be highly resource-intensive, and in many countries existing survey data is derived from individual technology-specific exercises, rather than a standardized approach across all technologies (Cameron & Van Der Zwaan, 2015). Input-output analysis is often limited by a shallow degree of disaggregation of the energy sector in standard input-output tables: for example, data may be structured so that energy is represented as a single joint sector, or as one sector for petroleum products and one for electricity (Bacon & Kojima, 2011). A fine degree of disaggregation is required for input-output analysis of an energy transition, including at least data that disaggregates between conventional and renewable energy technologies in the transport and electricity sectors. Moreover, in some countries, input-output models are not regularly updated, so the best-available data can be significantly out of date (Bacon & Kojima, 2011).

Few studies on renewable energy employment have been conducted in developing or emerging economies, leading to an over-reliance on employment factors from OECD countries. In such contexts, the development of robust employment factors is an important step in planning for a just transition. In countries with extensive data and bodies of research, model plant data may exist that can be used to estimate project-level employment across a range of conventional and renewable energy technologies, such as the Job and Economic Development Impact (JEDI) model developed by the U.S. National Renewable Energy Laboratory (NREL) (Bacon & Kojima, 2011). Such models are typically based on multipliers from input-output data, but may also be adjusted and updated based on bespoke data collection activities, such as survey data, or interviews with industry experts and project developers (Bacon & Kojima, 2011; NREL, n.d.). NREL's JEDI model is also designed to estimate factors such as average earnings, the share of spending that will take place locally, the specific goods and services associated with different projects, and how outcomes will vary in different states and tax jurisdictions (NREL, n.d.).

With adequate baseline data on employment, it is then possible to use a range of energy sector models that can project how energy systems will change over time, and link these impacts back to employment factors. Some models, such as LEAP, are developed specifically around identifying the energy, emission and costs of specific user-defined scenarios, and can be adapted to integrate employment factors (Energy Community, n.d.). Other models, such as MARKAL and TIMES, are designed to identify the optimal energy supply to meet a given level of demand at the lowest possible costs, taking into account exogenous assumptions about demand, relative prices and any real-world policy constraints, such as existing national energy targets or greenhouse gas emissions levels (IEA-ETSAP, n.d.). In addition to identifying robust baseline employment data, the main challenge for forward-thinking modelling on energy sector employment is to ensure that reasonable assumptions are made about how employment factors will change over time. This is hard to predict and typically requires some form of sensitivity analysis. In a recent modelling exercise on economic transitions linked to automation, global consultancy firm McKinsey accounted for scenarios where productivity across the renewable energy value chain would plateau (maximum employment generation) or continue to improve at historical rates (minimum employment generation) (McKinsey & Company, 2017). Such analysis should also be applied to



conventional energy generation, particularly in countries that have not yet fully adopted available technologies to improve efficiency of fuel extraction, refining and distribution, which have historically driven significant levels of labour displacement in many advanced economies.

Economic and energy system models tend to specialize in identifying points of equilibrium before and after change—but if we are interested in a just transition it is important to be able to explore the transition pathway itself, including the scale and duration of unemployment linked to a transition, before new jobs are found or created. Most energy sector models can be adjusted to project outputs on a year-by-year basis, but some form of labour system modelling is then required to estimate likely duration of employment and prospects for re-employment. Following the 2008 financial crisis, the International Labour Organization (ILO) used an econometric approach to forecasting unemployment and unemployment “stickiness” over the short- and medium-term, estimating factors for impacts based on historical data about unemployment rates during periods of crisis and recovery, disaggregated by countries and regions (ILO, 2010). McKinsey’s work on economic transitions linked to automation takes a scenario approach, and simply assigns different re-employment rates in different countries over low, medium, high and full scenarios, based on historical data where available, and adapted as necessary to account for conditions such as labour market flexibility, professional skills and differences in the geographic location of declining and growing sub-sectors (McKinsey & Company, 2017). Most countries have existing systems for projecting unemployment trends, and analysis should engage with these as a starting point as far as possible.

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