Fossil Fuel Subsidy Reform and the Just Transition:

Integrating approaches for complementary outcomes

GSI REPORT

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Executive Summary

This paper articulates how fossil fuel subsidy reform (FFSR) can contribute to a just transition, and how FFSR can be more successful under a just transition framework. The report explores a number of reasons for a framework, including alignment of the objectives of FFSR and just transition and, very importantly, FFSR's ability to unlock revenues for implementing just transition.

According to the ILO *Guidelines for a Just Transition Towards Environmentally Sustainable Economics and Societies for All*, transitions to environmentally and socially sustainable economies can become a strong driver of job creation, job upgrading, social justice and poverty eradication. (International Labour Organization, 2015).

Fossil fuel subsidies act against sustainability, while reform is consistent with just transition principles. These subsidies also exacerbate greenhouse gas emissions, which contribute to climate change: "Research estimates that the removal of global fossil fuel subsidies to fossil fuel consumption would lead to a global decrease in carbon emissions of between 6.4 and 8.2 per cent by 2050" (Merrill, et al., 2017). In addition, a removal of global subsidies to fossil fuel production would save 37 Gt of carbon dioxide emissions over the same timeline (Gerasimchuk, Bassi, Ordonez, Doukas, & Merrill, 2017). Thus, the elimination of all subsidies to fossil fuel production and consumption globally will reduce emissions by roughly 10 per cent.

This paper goes into detail about the various ways in which FFSR can be consistent with just transition. The scale of current fossil fuel subsidies in the world coupled with the massive financial needs for transition are early indicators of the benefits of approaching FFSR with just transition in mind. Leveraging this misspent finance to support just transition is just one of many ways in which these issues can coalesce.

The Cost of Just Transition

The cost of just transition is estimated to be very high according to recent estimates. A just transition framework for U.S. workers involved in fossil fuel production alone is estimated at USD 600 million per year for supports for workers facing retrenchments, guaranteeing pensions for workers in affected industries and mounting transition programs for affected communities (Pollin & Callaci, 2016). Another example of a transition from the Netherlands for mining workers was estimated to cost approximately EUR 11.6 billion in national subsidies for supporting coal prices and regional reconversion (Caldecott, Sartor, & Spencer, 2017). One estimate of the Dutch case estimated the re-investment in new economic activities at EUR 300,000–400,000 per long-term job created (Caldecott, Sartor, & Spencer, 2017).

The Implications of Fossil Fuel Subsidies and their Reform

Approaching just transition through FFSR requires an understanding of what FFSR can achieve and how this reform can be successful and long lasting. Fossil fuel subsidies are a barrier to just transition and green economies because they are often socially regressive—failing to help the poor and propping up sectors that would otherwise become non-competitive rather than focusing on long-term economic and employment planning. In 2010, a review of developing countries by the International Monetary Fund indicated that 92 per cent of fossil fuel consumption subsidies were actually realized by the top four quintiles of society (Friends of Fossil Fuel Subsidy Reform, 2015). This same study found that the distribution of subsidy benefits was actually weighted to the top quintile for all fuels studied (Arze del Granado, Coady, & Gillingham, 2010). One of the main justifications for subsidies is their benefits for the poor, but in reality it is not the poor who receive most of the benefits. Even if the aforementioned environmental and economic arguments for reform are set aside, in most cases studies, these fossil fuel subsidies fail in terms of even their social justification for existence. If reformed, programming, financial supports and other benefits could be much better targeted to workers in fossil fuel sectors and the poor, who need these supports the most.

Three core elements for successful FFSR have been identified in the Global Subsidies Initiative (GSI) publication *A Guidebook to Fossil-Fuel Subsidy Reform for Policy-Makers in Southeast Asia* (Beaton et al., 2013):

- Getting the prices right
- Managing impacts
- Building support

These three elements serve as useful guidance for ensuring that FFSR will contribute to just transition.

Creating Budgetary Space for Just Transition Through Subsidy Reform

There is much focus on the need for directing public and private investment to low-carbon and sustainable outcomes, and also the significant requirements for climate change. The Organisation for Economic Co-operation and Development (OECD) has projected the scaling up of developed country pledges for climate finance to total as much as USD 67 billion by 2020, but still only representing two thirds of the required USD 100 billion goal (OECD, 2016), with uncertainty about the potential for private finance. Compounding this is that this commitment is only for addressing climate change, with no guarantee that this finance will also support objectives of just transitions (although this is certainly the hope of many countries). Individual country estimates for just transition have also reached into the billions of dollars, but lack clarity on how much of this is infrastructure and how much is for worker supports.

Regardless, we know three things:

1. The scale of finance required is not known but is expected to be in the order of many billions of dollars.
2. Developed country contributions to international climate finance, even when coupled with private investment, are not guaranteed to provide the scale or targeted supports required to support just transition.
3. Fossil fuel subsidies total at least USD 425 billion per year, which, if removed could go a long way to financing just transition.

This is why FFSR can be such a fundamental tool for financing just transition. At a time of austerity in many regions of the world, the budgetary space required for investments in worker supports, education, health and social programming can place pressure on public budgets and strain the political economy and public support for just transition if the financing is not in place to achieve the desired objectives.

Lessons and Additional Thoughts on Achieving Development Goals

This paper contains several examples of how sectors can transition, and how, at least in theory, these transitions can be conducted using methods that are simultaneously considerate of green economies and just transition. We have also looked at how FFSR can be a simultaneous process that contributes to the objectives of green economies and the just transition.

Some of the key takeaways of this exercise include:

- While none of the governments undertaking FFSR processes examined in the case studies explicitly addressed the issue of just transition and the green economy as an objective, in looking at their motivations, it is clear that it is an underlying theme, even if it is implicit as opposed to explicit or framed in alternative terminology. The transition in the Netherlands, for instance, adopted key themes about protection of workers and ensuring stable transition for them 40 years before the idea of just transition gained international prominence. In other countries, such as Mexico, engaging representatives of workers proved critical to successful implementation.
- What we find in several of the countries is that restructuring of FFSR is not only beneficial to a just transition, it is critical, and vice versa. For several of these countries, including Mexico, Argentina and Indonesia, subsidies to the fossil fuel industry were becoming an ever-increasing burden on the public purse, to the point in some that FFSR was as much a necessity as it was a desire. Without the burden of

fossil fuel subsidies, some of these governments were able to avoid having to cut government services, while in others, such as Indonesia and Morocco, reform of subsidies is directly tied to investments in the social safety net and clean energy industries. Without public funds tied up in unsustainable price controls or subsidies to promote struggling sectors, spending could be done in a way that is much more consistent with the objectives and principles of just transition.

- We also find that stakeholder engagement and public communication are key to successful implementation. In Indonesia, President Joko Widodo made it a priority to communicate the necessity for and benefits of reforms. In the Netherlands, (then Minister) Joop den Uyl spoke to the need for transition to focus on the benefit to workers and to bring labour and employers to the table together to plan and implement transition. In Mexico, it was only after workers' groups were engaged that some of the initial protests from these groups started to abate.
- We also find that FFSR is important for both consumption and production subsidies. We learn that, even for consumption subsidies targeted at supporting the poor, many of the benefits are often realized by the upper income groups in society. We also see that, even where subsidies were retained in the short term to assist in keeping a sector stable while transition occurs, such as in the Netherlands, they were always intended to be in place to support worker transition, and ultimately reformed when no longer necessary to support worker transition.
- Critically, we also see that FFSR can be a key funder for just transition. In 2015, global subsidies to both consumption and production of fossil fuels were at least USD 425 billion. At the same time, the cost of just transition will be significant. Reforming fossil fuel subsidies will contribute to the transition to green economies by removing supports for fossil fuel sectors that harm the environment; utilizing the revenue raised from reform can go a long way to supporting the policies, programs and infrastructure that are required for just transition. Several case studies identified the ability for FFSR to help stabilize budgets in crisis (Argentina, Mexico) or create much needed investment revenues for national priorities (Indonesia).

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Abbreviations and Acronyms

CSP	concentrating solar power
EOMP	expected open market price
FFS	fossil fuels subsidies
FFSR	fossil fuel subsidy reform
FTE	full-time-equivalent
GDP	Gross Domestic Product
GHG	greenhouse gas
Gt	gigatonnes
IEA	International Energy Agency
ILO	International Labour Organization.
INDC	Intended Nationally Determined Contributions
MASEN	Ministries of Energy, Mines, Water and the Environment
MW	megawatts
NDC	Nationally Determined Contribution
OECD	Organisation for Economic Co-operation and Development
SDGs	Sustainable Development Goals
WTO	World Trade Organization

1.0 Introduction

The goal of this paper is to articulate how fossil fuel subsidy reform (FFSR) can contribute to a just transition and how FFSR can be more successful under a just transition framework. A number of reasons are explored in the report, including alignment of the objectives of FFSR and just transition, and very importantly, the ability of FFSR to unlock revenues for implementing a just transition.

Before this paper explores how the two can work together, it is important to conceptualize what FFSR and just transition mean. Though there is no universal agreement on a definition, the World Trade Organization (WTO) defines subsidies as financial contributions by governments or other public bodies where there are direct transfers of funds, foregone or uncollected revenues, provision of goods or services, or any form of income or price support (Gerasimchuk, Wooders, Merrill, & Sanchez, 2017). FFSR, then, means to remove, reduce or reform the subsidies dedicated to fossil fuels. These subsidies are often inefficient, with benefits going to the rich instead of the poor. In addition, their very existence indicates that money is being spent on supporting the combustion of fuels that are damaging the environment, instead of being spent on social or educational initiatives, or even just better structured tax reductions for people or companies that do not result in negative environmental impacts.

Just transition "brings together workers, communities, employers and government in social dialogue to drive the concrete plans, policies and investments needed for a fast and fair transformation. It focuses on jobs, livelihoods and ensuring that no one is left behind as we race to reduce emissions, protect the climate and advance social and economic justice" (International Trade Union Confederation, 2017). Naturally, these processes can work in a coordinated manner to produce strong outcomes.

According to the International Labour Organization (ILO, 2015a) *Guidelines for a Just Transition Towards Environmentally Sustainable Economics and Societies for All*, transitions to environmentally and socially sustainable economies can become strong drivers of job creation, job upgrading, social justice and poverty eradication. The specific guidelines for just transition include (International Labour Organization, 2015b):

- Employment-centred macroeconomic and growth policies
- Environmental regulations in targeted industries and sectors
- Creating an enabling environment for sustainable and greener enterprises
- Social protection policies to enhance resilience and safeguard workers from the negative impacts of climate change, economic restructuring and resource constraints
- Labour market policies that actively pursue job creation, limit job loss and ensure that adjustments related to greening policies are well managed
- Occupational safety and health policies to protect workers from occupational hazards and risks
- Skills development to ensure adequate skills at all levels to promote the greening of the economy
- The establishment of mechanisms for social dialogue throughout policy-making processes at all levels
- Policy coherence and institutional arrangements for the mainstreaming of sustainable development and ensuring stakeholder dialogue and coordination between policy fields.

1.1 Promoting Sustainability through Just Transition and FFSR

Fossil fuel subsidies also exacerbate greenhouse gas (GHG) emissions, which contribute to climate change: "Research estimates that the removal of global fossil fuel subsidies to fossil fuel consumption would lead to a global decrease in carbon emissions of between 6.4 and 8.2 per cent by 2050" (Merrill, et al., 2017). In addition, a removal of global subsidies to fossil fuel production would save 37 Gt of carbon dioxide emissions over the same timeline (Gerasimchuk, Bassi, Ordonez, Doukas, & Merrill, 2017). Thus, the elimination of all subsidies to fossil fuel production and consumption globally will reduce emissions by roughly 10 per cent.

Fossil fuel subsidies act against sustainable development, and therefore their reform—understood to include both phase-out and better targeting vulnerable groups—can be a useful tool in advancing both just transition and transition to green economy.

UN Environment's *Green Economy Report* defines a green economy as one that is focused on "human well-being and social equity" (United Nations Enviroment Programme, 2011) that drives growth in income and employment through low-carbon investments. The green economy seeks to achieve the same benefits as the decent work agenda. The ILO (2011b) background note to *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication* states that green investment can reduce environmental damage, while creating more economic opportunities and jobs. Including a social dimension can help protect workers, families and communities.

While not identical, just transition and green economy are interlinked on a basis of social, environmental and economic improvement with supporting themes of poverty reduction, growth that brings jobs and inclusive development.

The guiding principles for just transition include (International Labour Organization, 2015a):

- Strong social consensus on the goals and pathways to sustainability is fundamental. Social dialogue has to be an integral part of the institutional framework for policy making and implementation at all levels. Adequate, informed and ongoing consultation should take place with all relevant stakeholders.
- Policies must respect, promote and realize fundamental principles and rights at work.
- Policies and programs need to take into account the strong gender dimension of many environmental challenges and opportunities. Specific gender policies should be considered in order to promote equitable outcomes.
- Coherent policies across the economic, environmental, social, education/training and labour portfolios need to provide an enabling environment for enterprises, workers, investors and consumers to embrace and drive the transition towards environmentally sustainable and inclusive economies and societies.
- These coherent policies also need to provide a just transition framework for all to promote the creation of more decent jobs, including as appropriate: anticipating impacts on employment; adequate and sustainable social protection for job losses and displacement; and skills development and social dialogue, including the effective exercise of the right to organize and bargain collectively.
- There is no "one size fits all." Policies and programs need to be designed in line with the specific conditions of countries, including their stage of development, economic sectors and types and sizes of enterprises.
- In implementing sustainable development strategies, it is important to foster international cooperation among countries. In this context, we recall the outcome document of the United Nations Conference on Sustainable Development (Rio +20), including Section VI on means of implementation.

While this paper goes into detail about the various ways in which FFSR can be consistent with just transition, the scale of current fossil fuel subsidies in the world, coupled with the massive financial needs for transition are an early indicator that there may be a benefit to reforming subsidies with just transition in mind. Leveraging this misspent finance for supporting just transitions is just one of many ways in which these issues can coalesce.

We need to achieve simultaneous transition: just transition for workers and the overall transition to a green economy, both of which can be supported by subsidy reform. The Sustainable Development Goals (SDGs) also apply to this discussion, covering everything from climate action, to sustainable consumption and production, to clean energy to decent work (United Nations, 2017). There are different means of implementation for the green economy and just transition, and FFSR is one of them. FFSR is also a means of implementation for SDGs, given its benefits for clean energy and climate change.

Finally, FFSR can have potentially negative impacts on vulnerable groups, and we need to address these concerns. One particular example is early retirement for coal miners and regional aid in fossil fuel-producing

regions—it is necessary to make sure that the subsidies that are in place actually serve social causes and do not perpetuate the fossil fuel industry. Where this is not the case, reforms should be taken to ensure that social protections, particularly for workers, are retained that do not focus on perpetuating fossil fuels.

1.2 The Economic Dynamics of Just Transition and FFSR

From an environmental standpoint, subsidies for fossil fuels support activities that promote the combustion of these fuels. Globally, these subsidies are currently estimated at at least USD $425 billion per year (Gerasimchuk, Wooders, et al., 2017). The International Energy Agency (IEA) provides 2015 estimates for countries around the world. The top fossil fuel subsidies are paid out by Iran and Saudi Arabia, which spend an estimated USD 52.400 billion and USD 48.650 billion, respectively (IEA, 2016). Outside of the Organization of the Petroleum Exporting Countries, Russia, China and India have the largest fossil fuel subsidies, amounting to an estimated USD 30.333 billion, USD 19.240 billion, USD 19.210 billion, respectively (IEA, 2016). To provide a global picture, Figure 1 illustrates countries and their fossil fuel subsidies.

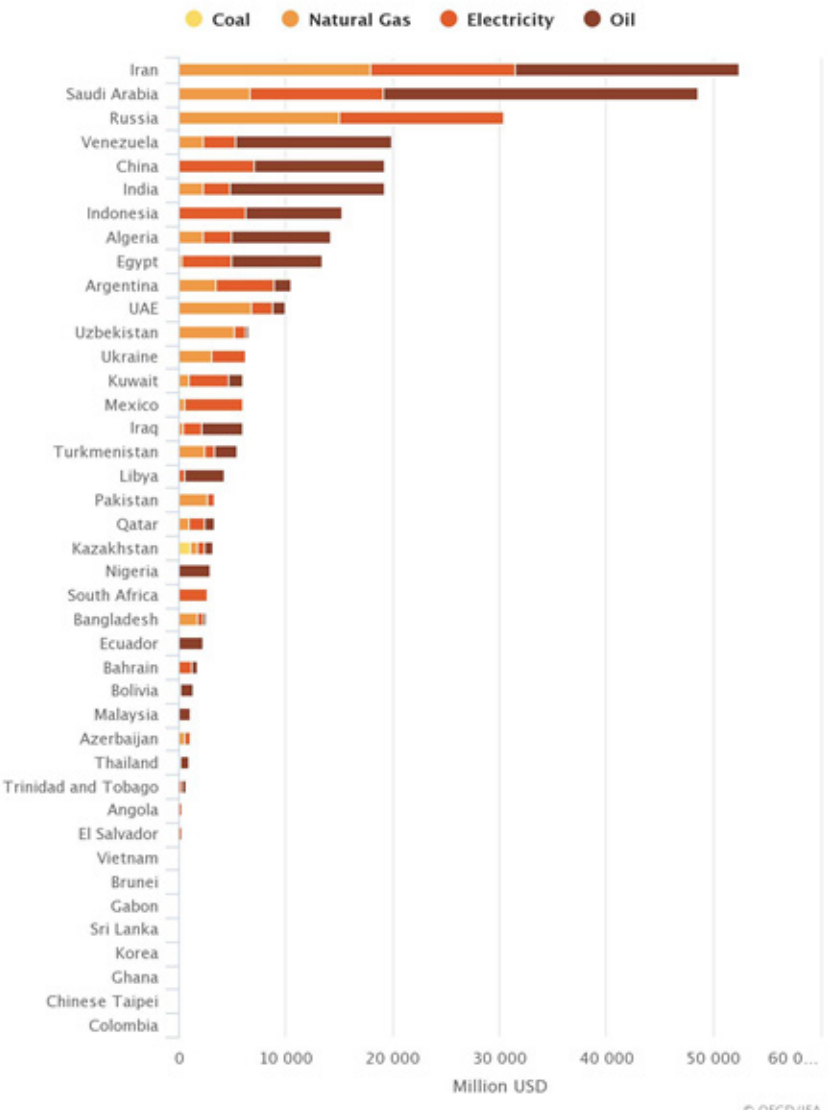

Figure 1. Fossil fuel subsidies by country, 2015

Source: IEA, 2016

The cost of just transition is estimated to be very high according to recent estimates. A just transition framework for U.S. workers involved in fossil fuel production alone is estimated at USD 600 million per year for supports for workers facing retrenchments, guaranteeing pensions for workers in affected industries and mounting transition programs for affected communities (Pollin & Callaci, 2016). Another example of a transition from the Netherlands for mining workers was estimated to cost approximately EUR 11.6 billion in national subsidies for supporting coal prices and regional reconversion (Caldecott, Sartor, & Spencer, 2017). One estimate of the Dutch case estimated the reinvestment in new economic activities at EUR 300,000–400,000 per long-term job created (Caldecott, Sartor, & Spencer, 2017).

There are also actions and investments that will be needed to ensure industrial competitiveness and support both declining sectors through the transition process (to avoid collapse) as well as boost new and emerging sectors that will contribute to transition. Reform of fossil fuel subsidies can create revenues for transition, but it can also naturally create a more level playing field, for example, by removing competitive disadvantages for renewable energy that emerge when fossil fuel sectors receive subsidies to increase their competitiveness.

1.3 The Dimensions of FFSR and its Relation to Just Transition

From a socioeconomic standpoint, the benefits of these subsidies often do not go to those who would need them most; rather, acting in a regressive manner they often benefit the wealthy more than they do the poor (World Bank, 2012). International studies have shown that, on average, the lowest income quintile only receives roughly 7 per cent of the benefits of fossil fuel consumption subsidies (Beaton et al., 2013), while the top 20 per cent receive over 40 per cent of benefits. Subsidy reform can free up the funds to provide targeted assistance for the poorest households (Beaton et al., 2013). Subsidies can also take a heavy toll on public budgets. These amounts have an opportunity cost, because they could be dedicated to other activities that more actively promote just transition, or even just basic public benefits such as investments in health care, education or employment.

In addition to its expected benefits, FFSR may also have potential negative side effects that must be mitigated in line with the objectives of just transition. Best practices and good designs of FFSR require complementary policies in support of vulnerable groups to offset the negative impacts of energy prices and potential job losses in fossil-fuel-energy-producing and energy-intensive industries. Complementary measures for industry are also part of the discussion in order to assist transitioning sectors, help build new sectors and help prevent economic collapse in sectors under transition.

The rationale for fossil fuel subsidies often includes the best intentions for workers and communities, in terms of promoting energy access or supporting employment-intensive sectors of economies. However, in practice, there are often more efficient policies that can achieve these same stated policy objectives.

1.4 On the Global Agenda: Rationale for and Commitments to FFSR

Even without a concrete link to its potential to contribute to just transition and a green economy, many countries are now looking to undertake FFSR for any number of reasons. Subsidy reform was one of the approaches to fiscal reform for GHG reductions in Intended Nationally Determined Contributions (INDCs) submitted under the United Nations Framework Convention on Climate Change processes. The International Institute for Sustainable Development (IISD) and German Society for International Cooperation (GIZ) identified 13 INDCs with explicit reference to FFSR (Terton et al., 2015). In some cases, these commitments were significant parts of GHG mitigation contributions, for example, Morocco's commitment to FFSR is expected to contribute a 6.6 per cent reduction from business-as-usual emissions by 2030.

Similarly, the G7, G20 and Asia-Pacific Economic Cooperation committed to FFSRs in 2009, with the G20 committing to "phase out and rationalize over the medium term inefficient fossil fuel subsidies while providing targeted support for the poorest" (G20, 2009). The G7 also called for all countries to eliminate inefficient fossil fuel subsidies by 2025 (Gerasimchuk, Wooders et al., 2017).

Individual countries have also taken on subsidy reform for a number of reasons. We examine some of these in Section 4, noting where approaches are consistent with just transition, and where some challenges have arisen

in cases where just transition principles were not a primary consideration. Just over the past three years, over 50 countries have undertaken efforts to reform or remove subsidies, creating fiscal space for repayment of debt and development activities (Gerasimchuk, Wooders et al., 2017). In Indonesia, President Joko Widodo noted that his desire for subsidy reform was to create increased budgetary space for infrastructure, education and health (Jakarta Globe, 2014a), a plan backed up through budgetary analysis pre- and post-reform (Pradiptyo et al., 2016). In Mexico, subsidy reforms have been tied to budgetary pressures in the opposite direction, with claims that reforms will help the government avoid cuts in social programming (Semple & Malkin, 2017).

These individual country case examples, and others, will be examined, noting where reforms have been successful and have supported just transitions, not only for their desired outcomes but for the benefits they have presented for workers and employers. In other cases, where there have been challenges in enacting reforms, these will be noted as well, identifying where stronger adherence to the guidelines for just transition may have presented ways to avoid some of the challenges or rectify them.

First, the following section outlines how the just transition can be approached by utilizing FFSR as one of the tools, noting key elements of FFSR that support transition.

2.0 Core Aspects of Fossil Fuel Subsidies (and their Reform) and Implications for Just Transition

Approaching just transition through FFSR requires an understanding of what FFSR can achieve and how this reform can be successful and long lasting.

The preceding section has outlined some of the benefits of FFSR, but just the existence of fossil fuel subsidies is a detriment to just transition. Fossil fuel subsidies are a barrier to just transition and green economies because they are often socially regressive, failing to help the poor and propping up sectors that would otherwise become non-competitive, rather than focusing on long-term economic and employment planning. In 2010, a review of developing countries by the IMF indicated that 92 per cent of fossil fuel consumption subsidies were actually realized by the top four quintiles of society (Friends of Fossil Fuel Subsidy Reform, 2015). This same study found that the distribution of subsidy benefits was actually weighted to the top quintile for all fuels studied (Arze del Granado, Coady, & Gillingham, 2010). These subsidies are often designed with benefitting the poor as one of their main justifications, but in reality it is not the poor who receive most of the benefits. Even if the aforementioned environmental and economic arguments for reform were set aside, in most cases studies these fossil fuel subsidies fail in terms of even their social justification for existence. If reformed, programming, financial supports and other benefits could be much better targeted to workers in fossil fuel sectors and the poor, who need these supports the most.

Three core elements for successful FFSR have been identified in the GSI publication *A Guidebook to Fossil-Fuel Subsidy Reform for Policy-Makers in Southeast Asia* (Beaton et al., 2013):

- Getting the prices right
- Managing impacts
- Building support

These three elements serve as useful guidance for approaching just transition through FFSR.

2.1 Addressing Pricing Challenges and Fixing Distorted Markets through a Just Transition Framework

When fossil fuels are subsidized, these subsidies "do not reduce the cost of energy, they just move it onto the population in a different way" (Beaton et al., 2013). What this means is that these subsidies still have to be accounted for either through increased taxes (to fund public expenditures on subsidies), foregone expenditures (for example in employment supports or the social safety net), foregone revenues (that could be invested in just transition), public deficits and a lack of investment in other infrastructure that could be beneficial to workers, families and communities. This does not even take into account the energy market distortion that these subsidies can create, stunting growth in energy sectors that could produce green and decent jobs.

While many national and subnational governments are moving to carbon pricing as a way to cost the negative externalities of fossil fuels related to global change, many of these same jurisdictions retain some form of fossil fuel subsidies. These subsidies undermine the intended purpose of these carbon-pricing programs: they effectively make it cheaper to burn fossil fuels while attempting to increase the cost of these polluting fuels by placing a carbon price on them (Saxe, 2016). In effect, fossil fuel subsidies can act as a negative carbon price by making it cheaper to produce or consume fossil fuels than it is to produce or consume cleaner fuels, in direct opposition to the objectives of just transition.

This relates to the wider market distortion issue that is inherent in fossil fuel subsidies. These subsidies can create competitive advantages for fossil fuels that also act as competitive disadvantages for non-fossil fuel energy sources. This alone hinders structural transformation for those sectors and workers into sectors more consistent with green economies that will form the basis of sustainable employment in the longer term. By making fossil

technologies cheaper to use, these subsidies also make it more difficult for greener and more transition-friendly technologies to emerge, stunting transition.

Getting the prices right entails focusing on the fundamentals of supply and demand. There are two components to good fossil fuel pricing structures (Beaton et al., 2013):

1. Market-based prices for fossil fuels
2. Creating an enforcing a competitive and efficient fossil energy market (by avoiding false price indicators through subsidies)

However, in the context of just transition, and even just within achievement of successful FFSR, there is recognition that these transitions cannot occur overnight without significant impacts on the economy, on industry, on workers and on people who use fossil fuels. The risk to FFSR on its own is that unsustainable implementation efforts can lead to repeal of reform efforts, the re-imposition of subsidies and sector instability.

For just transition, there are also very real concerns about getting the prices right. While the goal is moving to market-based prices, transitions have to be considerate of the impact on workers and communities that are used to subsidized energy prices, threats to energy access from price spikes and fluctuations in energy prices. Industrial sectors and communities have long been used for stable and below-market price energy access. Impacts on the economy from shifts in energy prices from subsidized, below-market rates to international market prices can also cause competitiveness impacts for energy-intensive industries, which can lead to job losses and economic retrenchment in certain sectors, unless efforts are made to adjust.

There are tools for ensuring that countries get to the right prices in sustainable ways. These can include temporary adjustment mechanisms that transition to market prices over time, but in a measured and predictable way. There are also ways in which mechanisms can be installed for the long term to ensure that market-based fuel pricing regimes are "economically and socially sustainable" and "balance consumer energy access with the economic realities of fluctuating fuel prices and the desire to avoid a return to massive subsidies" (McCulloch et al., 2017). To ensure fiscal sustainability while minimizing fluctuation and volatility, mechanisms are needed that both allow fuel prices to stay close to market rates and include protections that can protect consumers from shocks that have negative social impacts. For example, Figure 2 depicts the history of transport fuel prices in Indonesia. The blue line represents international market prices for transport fuel. The green line is the actual purchase price in Indonesia, first indicating a significant subsidy and then approaching market prices after the government-enacted reforms. Finally, the red line is a smoothed approach that stays constantly close to market prices, but makes adjustments to avoid significant price spikes and drops.

There are methods to adjust prices, but the key is to help ensure predictability based on market prices overall and avoid subsidies that keep prices artificially low.

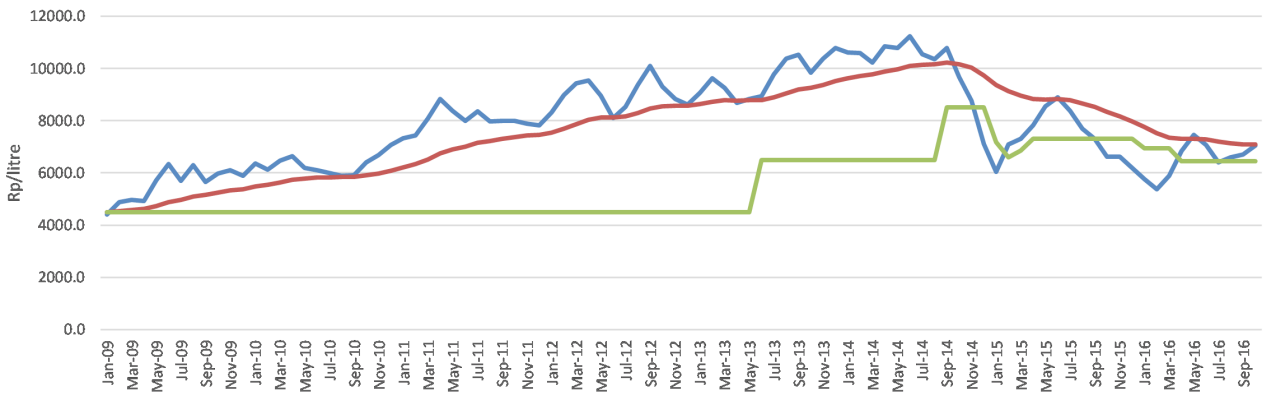

Figure 2. Example of a "smoothing" approach to FFSR

Source: McCulloch et al., 2017

Subsidy reform can also entail targeted subsidies for supporting employment, such as in the Philippines where targeted supports were put in place to assist Jeepney drivers through price controls, a move that not only assisted drivers but helped retain a popular form of public transit for locals (Beaton et al., 2013). In these cases, a form of subsidy remained after overall fuel subsidy reform, but it was much more targeted than the previous subsidies for the purpose of assisting key public services and exposed workers.

In regards to industry and large-scale employers, there are also examples of how reform can be beneficial. A GSI study of Vietnam found that foreign investors were not seriously concerned about the prospect of gradually higher power prices as subsidies were reformed, provided supply investments were secure. Vietnam Electricity ran at a loss, and there was a need to raise prices to secure reliability and supply. In fact, rather than increased rates, industry was much more concerned about inadequacy of power supply and prospects for diminishing reliability rather than higher prices (Garg, Bridle, & Clarke, 2015).

Working with employers and employees through the policy design process can also help to get the prices right during the adjustment while focusing on retaining competitive markets. Transparent and planned price adjustments as well as investing subsidy savings, at least partially, in lower-carbon development can help sectors adjust to cleaner energy sources and maintain industrial competitiveness. These types of investments can also lead to employment that is more prepared for green economies.

It is very important to get the prices right through FFSR strategies, moving to market prices, in a manner that considers impacts. Sudden shifts can create shocks to the economy and citizens, while gradual approaches have risks related to hoarding fuels to profit from adjustments, as well as a need for sustained political capital. The situation in each country is different, as are the economic dynamics.

2.2 Managing Impacts and Avoiding Unintended Consequences of FFSR

Having already touched on some of the dynamics of undertaking FFSR, there are a number of potential obstacles to pursuing FFSR consistent with just transition. FFSR can be undertaken for any number of motivations, including restructuring public budget deficits, transitioning to clean energy sources, reducing GHG emissions and air pollution, and creating fiscal space for issues like investment in key infrastructure and poverty alleviation. Undertaking FFSR consistent with just transition entails consideration of all of these issues simultaneously, including those where FFSR can potentially have negative side effects or unintended consequences in one area while making improvements in another (e.g., GHG reduction efforts resulting in job losses).

Common potential impacts of reform include inflation, changes in energy access and potential exacerbation of poverty impacts for low-income households. The following looks at some of these challenges and how to address them through the lens of FFSR and just transition.

2.2.1 How Communities and Enterprises React to FFSR Changes in Markets

When FFSRs are enacted, the changes that they make to markets cause reactions among enterprises. These reactions differ based on the nature of the enterprise, but we look in general at the reactions from industries and communities.

Response measures for industries can fall along four themes (Rentschler, Kornejew, & Bazilian, 2017):

- **Absorption:** Accepting smaller profit margins resulting from energy price increases. This is more often a short-term reaction for companies while planning for the other measures in an attempt to recover lost profits.
- **Substitution**: Switching newly unsubsidized energy types for ones that are cheaper. This can be a positive shift if the move is to a cleaner energy sources; however, it can also be a negative shift if it is to a cheaper, but more potentially harmful energy source (e.g., shifting LPG to kerosene or unsustainable biomass).

- **Resource efficiency:** Directly, firms can look to reduce their cost through energy efficiency in an attempt to reduce exposure to increased prices. Indirectly they can also look to increase material efficiency across the resources used in an attempt to reduce costs in other areas to offset for increased energy costs. From an FFSR perspective, any form of efficiency is seen as a positive reaction associated with "modernisation, innovation, and reduction of negative externalities of inefficient energy use" (Rentschler, Kornejew, & Bazilian, 2017). However, from a just transition perspective, efficiency has to be carefully assessed for its potential impacts in other areas of the economy, notably job impacts as demand for particular resources falls and there may be a reduction in these sectors and subsectors of the economy.
- **Pass on/pass through:** Subsidy reforms can have impacts on companies, but do not necessarily mean competitiveness losses since they have their own ways in which to mitigate impact or pass-through costs. The scale of subsidy reform impacts on companies is partially tied to the ability of these companies to react by passing through costs. For example, where there are highly regulated sectors that limit the ability to pass through cost, it is likely that the impacts will be felt upstream and the energy producers and distributors feel the brunt of costs in terms of increased costs and diminished profits. On the other hand, where markets are highly liberalized it is more likely that increased costs associated with subsidy reform will be passed through to consumers. Either way it is important for governments to estimate pass on/pass through potential as it will enable them to understand not only impacts and reactions from industries, but also impacts on consumers and communities if pass through is high.

In terms of other reactions beyond strictly economic and technical, it is common that industries, particularly those that are fossil fuel energy intensive, seek to oppose efforts to subsidy reforms citing competitiveness and profitability. They can exert political economy pressures for governments looking to implement reforms (Rentschler, Kornejew, & Bazilian, 2017), in particular by outlining potential job losses. With regards to just transitions, this can be troubling as attempts to reform subsidies can be framed as actions that will negatively affect jobs. These challenges make it more difficult for government to enact reforms, especially if employment benefits from reform are not well communicated, or employer or employee representatives do not see employment benefits from reform. This messaging, or alternatively the inability of governments to confront concerns, can also turn workers against reforms, even if reforms have clear employee benefits inherent in them, such as transition supports including retraining, supports for employment in green and emerging sectors, educational programs and investments in the social safety net. Developing coherent messaging and working closely with stakeholders (including employers, workers organizations and industries that will benefit from reform) can help alleviate this concern.

Reactions to subsidy reforms from individuals and communities are diverse and can depend on the nature of the reform. As outlined in the case studies, reactions to transport fuel subsidy reform in Indonesia were initially positive, characterized as entailing "virtually no dissent" (McCulloch, 2017), while in Mexico, it led to civil unrest and worker opposition. Undoubtedly, reaction is closely tied to the impact of reforms and public communications, not to mention market conditions at the time of reform. In Indonesia, prices for transport fuel declined over 20 per cent immediately following reform (Lontoh & Christensen, 2015), while in Mexico, at one point, they rose 20 per cent.

Fuel switching can also occur at industrial and individual household levels and must be monitored closely. If subsidy reforms and associated increases in energy prices motivate energy users to turn to fuels that are more negative in terms of their environmental, social or health impacts, then adjustments or response measures may be needed, or the entire process is at threat of being counterproductive.

Aside from fuel switching, another direct reaction may be a lack of energy access, as fuels are no longer affordable, or new sources of energy are not available in adequate supply. Indirectly, increased energy prices can contribute to poverty as household income is placed under greater pressure. A study of uncompensated subsidy removal in Nigeria projected an estimated 3–4 per cent increase in the national poverty rate (Rentschler, 2016), significant enough to warrant managing the impact of reform, as outlined in the following section.

2.2.2 Managing Impacts of Reform

Unintended negative impacts may come with reforms that are aimed at improving economic, environmental and social prosperity, including inflation and reduced energy access. There are ways, however, to anticipate and manage these impacts and avoid or mitigate their ability to retract from the objectives of just transition.

Projection and estimation of impacts is the first step in this process. This has typically been done on fiscal reform policies in terms of the impact they will have on the economy and, for climate change mitigation, the impact that approaches will have on emissions. Concerning just transition, estimating the impacts of FFSR would entail mapping out the extended impacts of the proposed reforms on employers and workers in multiple sectors. The principles for just transition entail the development of coherent policies across the economic, environmental, social, education/training and labour portfolios. With this in mind, consideration of impacts would have to cross these multiple issues. Developing a set of indicators that can be qualitatively and quantitatively measured is a good first step and can be done by engagement across government (see Section 2.1), and then verified in parallel to the engagement process for policy design. Examples of issues considered in just transition that could be considered for indicators include labour force participation, skills training and education availability, in addition to more standard indicators such as GDP, inflation and GHG emissions (ILO, 2013; Cruz, n.d.). The ILO has a long list of decent work indicators that can be drawn from in identifying the types of measurements that would be helpful (ILO, 2013), but it should be noted that the overall set of indicators is likely to be unique to each country based on individual goals, impacts and the makeup of the economy. Some specific indicators of transition may be the proportion of workers in green sectors versus fossil fuel sectors over time, or in terms of industries, an indicator of transition may be the shift in carbon intensity of GDP over time (i.e., the amount of emissions per $1 of GDP produced).

When considering impacts, both direct and indirect impacts must be taken into account. Indirect impacts can be large and are made up of things like higher prices for goods and services consumed by households. The prices of these goods are higher because of the increased production costs that result in higher consumer prices (Arze del Granado, Coady, & Gillingham, 2010). In many cases where the impact of fossil fuel subsidies have been assessed, the indirect impacts were over half of the total scale of impacts of reform. Adopting a cause-and-effect approach to impact analysis can be useful, including an understanding of energy use changes and their consequences for communities and families. For example, will the removal of natural gas subsidies lead small households to use biomass, which can have adverse health impacts? If the answer is yes, subsidy reforms will have to be structured in a way to avoid such an adverse impact.

Quantitative approaches to estimating impacts can be combined with qualitative approaches such as pilot projects and interviews with key impact groups. Poverty and social impact assessments of reforms would also help to ensure that the outcomes of reform are consistent with just transition.

It bears repeating that it is also essential that employer–worker engagement is a part of both managing impacts and impact assessment for FFSR. Involvement of these two groups of stakeholders and credible integration of their concerns into negative impact mitigation measures is key to building support for the response measures. This has been seen in how Mexico has managed its fuel reforms, as revealed in the case studies that follow.

The GSI *Guidebook to Fossil-Fuel Subsidy Reform for Policy-Makers in Southeast Asia* also recommends a focus to "accentuate the positive" (Beaton et al., 2013). This approach is partially an issue of ensuring that managing impacts does not become a negative story, but instead shows that, by taking action to mitigate the impacts of reforms, governments are acting in the best interests of employers and employees. Governments pushing these mechanisms in partnership with key stakeholders can help address concerns and develop more positive outcomes, taking into account stakeholder concerns and viewpoints throughout the process and designing policy structures that address their concerns.

It is just as important to keep in perspective that the ultimate objectives of just transition will be beneficial to societies through the entire process, and that the choice of approach (in this case FFSR) is based on the goal of returning the strongest outcomes for society. Communicating the benefits of FFSR and just transition for all is key not only to keeping a positive perspective on transition, but also central to building the case for reform

(see Section 2.1). This can be particularly important for workers who are also, as mentioned above, subject to messages from the opponents of FFSR that claim that it will lead to job losses for workers.

In general, mitigation measures fall into three broad categories: how reform is implemented, responses to impacts and efforts to counteract price increases (Beaton et al., 2013). The following looks at some specific approaches to incorporating these measures in addressing unintended consequences.

2.2.3 Avoiding Specific Unintended Consequences

There are many ways to avoid some of the unintended consequences of FFSR, while also leveraging greater outcomes consistent with just transition. Some of the common approaches include:

- **Utilizing Created Budget Space:** One of the most effective ways to avoid unintended consequences from FFSR is by utilizing the created budget space to address some of the concerns that may arise from reform. Utilizing budget space could include cash transfers to low-income households or other approaches such as broader-scale tax reforms targeted at particular income groups and competitively exposed sectors. In Indonesia, the savings from FFSR were reinvested in regional transfers, growth and poverty programs and infrastructure. These measures all help to address some areas of need and provide benefits that help offset impacts of subsidy reform, while also indicating the long-term benefits of eliminating subsidies. This could also entail greater investment in sectors that have public benefits and address some of the challenges that changes to market rates for fossil fuels entail, such as investments in poverty alleviation or research and development of renewable energy sources.
- **Smooth Implementation Plans:** Implementation plans that are well planned with long lead times, transparent approaches, understandable processes, and necessary regular review and adjustment will go a long way in helping to avoid unintended consequences. Phased implementation over a period of time, rather than sudden changes, can also be beneficial. Germany has an example of how FFSR implementation has been structured in a way that is consistent with concern for employment impacts. The Hard Coal Financing Act was adopted in 2007, stipulating the phase-out of production subsidies through 2018. Social acceptability was a key aspect of this reform, and as subsidies were reformed and removed, those that remained were designated to early-retirement schemes as an attempt to compensate for the unemployment caused by the phase-outs due to subsidy reform (Whitley & van der Burg, 2015). This structured implementation of reforms along a lengthy timeline, which actually dates back more than a decade before the Hard Coal Financing Act with German measures to increase transparency in subsidies to fossil fuels, serves to limit unemployment and other negative impacts that could potentially arise from FFSR. This process also allows these reforms to be smoothly implemented and their benefits to be realized. In Germany, EUR 4.9 billion in subsidies to hard coal in 1999 is scheduled to be removed entirely by 2018 (Organisation for Economic Co-operation and Development [OECD], 2011).
- **Supports for Workers:** It is well understood that the types of economic shifts that are consistent with FFSR will come with job losses, particularly in "brown" sectors that see jobs replaced by greener sectors. This occurs because financial supports to fossil fuel sectors are removed, affecting their competitiveness, which may lead to job losses. While the overall size of job turnover is predicted to be small, the ease of transition will be tied closely to the transferability of skills across sectors. The OECD has already noted the critical role of skills development for workers and that specifically targeted programs for regions with a high share of the labourer force in affected sectors could help alleviate some employment pressures (Kruse, Dellink, Chateau, & Agra, 2017). Wage supports for expanding sectors and investment in unemployment benefits for transitioning workers have also been touted to mitigate job losses at modest costs (Whitley & van der Burg, 2015).
- **Supports for Energy Consumers:** FFSR has the potential to create energy challenges for families. Price shocks created unrest in Mexico (Semple & Malkin, 2017) while in Indonesia, there is a risk that transport fuel reforms will backslide due to the perceived impacts of energy price increases, causing hesitation in matching fuel prices to market rates as prices rise (GSI, 2015). For lower-income households and poor communities, the impacts of FFSR can be just as disruptive. In Indonesia, a program designed to move people away from heavily subsidized kerosene to cleaner-burning LPG was

deemed a major success and led to USD 4 billion in savings (Pertimina, 2016); however, this was only achieved through significant subsidies for LPG that the government must now wrestle with. Removing these LPG subsidies could push people back to dirtier kerosene or other fuels, such as biomass, that would have adverse health impacts. Ensuring energy access for consumers to cleaner fuels is an essential part of any reform process. Options include: targeting subsidies only for the poorest households, technological assistance (cleaner cookstoves) or other forms of financial supports (e.g., supports for food, investment in community renewable energy generation, or even cash transfers) that do not take the form of subsidies for fossil energy fuels. New Climate Economy shows that investing in energy efficiency is a popular way to support consumers, noting progress in Indonesia and Iran (Whitley & van der Burg, 2015).

- **Employment Potential of the Renewable Energy Sector:** Focusing on employment opportunities in the renewable energy sector can address job losses. By restructuring and removing fossil fuel subsidies, governments create a leveller playing field for clean energy technologies. The renewable energy sector is also more labour intensive than fossil fuels (ILO, 2015) (see Table 1). The Netherlands (see case study) adopted an active approach, actually allowing emerging industries access to workers in transitioning industries in order to benefit both employees and employers. One study projected the average number of jobs per megawatt of capacity of solar photovoltaic to be between seven and 11 times that of coal and natural gas (Table 1) (ILO, 2011a). There are also opportunities through energy sector transition to focus on creating a more inclusive gender-balanced workforce (Pearl-Martinez & Stephens, 2016). Research has also noted that employment rates for women in renewable energy are higher, roughly double, than in fossil fuel and nuclear energy industries, although still far from gender parity (Pearl-Martinez & Stephens, 2016). FFSR will remove the competitive disadvantage for renewables, and created budget space can turn this into an advantage for employment-intensive renewable energy sectors.

Table 1. Average employment (jobs per megawatt of average capacity) over facility life

	Manufacturing, Construction, installation	Operating & maintenance / fuel processing	Total
Solar Photovoltaic	5.76-6.21	1.20-4.80	6.96-11.01
Wind Power	0.43-2.51	0.27	0.7-2.78
Biomass	0.4	0.38-2.44	0.78-2.84
Coal Fired	0.27	0.74	1.01
Natural Gas Fired	0.25	0.70	0.95

Source: ILO, 2011

These transitions are certainly not easy, and require much time and investment (in the Netherlands it took over 25 years). While not every country can shift to renewables in the short term, the goal is to shift to cleaner energy sectors over the long term through fiscal policies that do not subsidize fossil fuel production and use to the disadvantage of cleaner options. Without this long-term shift, just transition is jeopardized by economies that prioritize fossil fuels and the negative impacts they entail.

2.3 Building Support for Reform

Building support for reform "is about creating the political space that makes reform possible" (Beaton et al., 2013). Elements of this include internal coordination across governments, ensuring that government is speaking with one voice. Certainly if the issue is subsidy reform, there is need for coordination with financial and energy ministries, as well as political leadership. Internal coordination must also include integration of environmentally and socially focused bodies of government, including ministries representing health, poverty, gender, education, employment and environmental issues.

Being inclusive of all of the internal government bodies can help ensure that the just transition guiding principles are respected through the policy design process. Building support for FFSR with the objectives

of just transition requires that the voices within government that represent gender, workers' rights and other important issues have an important role in the reform process, ensuring it is inclusive of the viewpoints, concerns, opportunities and challenges that may arise. FFSR may not be able to address all of these issues, but with a strong intergovernmental dialogue and a suite of complementary policies, the design and implementation process can at least ensure inclusivity and buy-in.

Anabella Rosemburg (2017) of the International Trade Union Confederation discusses what will be required to build worker support for just transition in the areas of macroeconomic, sectoral and enterprise policies; rights and occupational safety and health; social protection; active labour market policies; skills development; social dialogue and tripartism; community renewal/economic diversification; and comprehensiveness. She offers guidance on building worker support for economic transitions that can be informative for FFSR, paraphrased here (Rosemberg, 2017):

- **Macroeconomic, Sectoral and Enterprise Policies:** New jobs created in sectors where growth is needed under the new model, sectoral policies with long-term targets for emissions and social progress, and supportive public sector policies such as procurement are key for fighting the jobs-versus-environment narrative
- **Rights and Occupational Safety and Health:** Ensuring that jobs in green sectors are appealing to workers, with decent incomes and safe work conditions, to support transition.
- **Social Protection:** Social security/insurance schemes; this also means looking to minimize job losses and provide income and employability supports to workers.
- **Active Labour Market Policies:** Focusing on workers at risk of unemployment and improving their employability, delivering employment services.
- **Skills Development:** Helping workers through skills development to obtain better and more sustainable jobs.
- **Social Dialogue and Tripartism:** Processes of discussion between workers, employers and governments, with resources to design responses to challenges.
- **Community Renewal/Economic Diversification:** Anticipating losses in revenue from declining sectors in dependent communities and empowering communities so that investments are oriented to options supported by the community.
- **Comprehensiveness:** Bringing this all together in a simultaneous transition.

When considering FFSR and just transition, building worker support for reform must include their active engagement as a strong starting point.

From an industry standpoint, there has been a lot of support for climate change and low-carbon action (for example the Carbon Disclosure Project and the G20 Financial Stability Board's Recommendations of the Task Force on Climate-Related Disclosures), but less on the requirements for industry and employers to support just transition. However, again, there are similarities between the conditions needed for support. The aforementioned Vietnam example (Section 2.1) is a good one, where it was determined through engagement with industry that they would support FFSR if it came with investments to improve infrastructure and supply of energy. In the Netherlands, supports were put in place to help industries transition their workers, including the opportunity for emergent industries to "bid" on workers in transitioning sectors to meet their employment needs (see Section 3.5). Short-term subsidies were also maintained to help assure industries that they would be protected from collapse during transition. In Indonesia, the government used some of the FFSR savings to invest in needed infrastructure and boost economic growth (Section 3.4). Basically, some entities can and will support reform/transition if there is a benefit and reforms are well planned and implemented with their concerns addressed. This may not be achievable for all industry players (for example, those in the coal sector), but effective engagement that considers how investment will present opportunities for industry is a good starting point.

The Just Transition Centre has looked at the issue of building the support of companies and investors, highlighting their need to be involved in social dialogue. Several case studies are provided in the report *Just Transition: A Report to the OECD* (Smith, 2017). The Danish transition from coal to wind starting in the 1970s is one of the examples provided that highlights the benefits for industry of the transition where Denmark's industrial policy for the wind sector "created a virtuous cycle of jobs in wind, wind power production, and investment in wind" (Smith, 2017). Industrial strategies to support the development of the wind power sector were seen as critical to the success of transition, in addition to a strong social dialogue between key stakeholders. In this example and others, clear and coherent government policies and effective stakeholder dialogue processes are seen as critical for building support from all stakeholders, including workers and employers.

The guidelines include explicit reference to the need for social dialogue, which entails that adequate, informed and ongoing stakeholder engagement is essential to the policy design process. With respect to FFSR and building the case for reform, the *Guidebook to Fossil-Fuel Subsidy Reform for Policy-Makers in Southeast Asia* also notes that "good communicators listen before talking" (Beaton et al., 2013), with effective reforms built upon an understanding of how stakeholders feel about proposed reforms, the options for reforms and how they will react to changes. This includes government stakeholders and those outside of government.

Stakeholder engagement models can employ a number of tools that include bilateral conversations, group meetings, social and traditional media engagement, and other outreach activities such as interviews and polling. The importance is that all affected stakeholders have an opportunity not just to offer input into the policy development process, but are engaged as a part of a process that is inclusive and actively incorporates the viewpoint of stakeholders into the design and implementation of reforms.

Bottom-up stakeholder engagement processes have the potential to be particularly inclusive. A bottom-up process engages (or is led by) key stakeholders very early in the policy design process, to identify the potential approaches that a government may take and tools it may use to achieve the ultimate objectives. An example of this is found in Port Augusta, Australia, where social dialogue began as a bottom-up process, in this case driven by community members, workers and their union, who were concerned about coal-fired power plants and local mines closing down. The community came up with its own plan for transition and presented it to the government, outlining a shift from coal to solar power that will keep the community alive (Smith, 2017).

In terms of pursuing FFSR and just transition, this may include beginning with basic awareness raising and capacity building about fossil fuel subsidies and the need for reform, as well as how these subsidies are a detriment to just transition and their reform can contribute to achieving transition.

Given the employment impacts of FFSR and just transition, special attention must be paid to including representatives of employers and employees as "core partners" (Smith, 2017) in stakeholder engagement. In parallel to steps highlighting likely impacts and consulting stakeholders on reform plans, various stakeholders representing diverse views (e.g., gender, poverty, labour, climate change, etc.) would each have an opportunity to suggest approaches and complementary policies that could achieve the ultimate objectives for just transition. These approaches and policies would then be considered and analyzed by government before any firm decisions are made in terms of approach.

Considering stakeholder concerns in early stages of policy formulation and seeing them through implementation is essential. It may be necessary to make adjustments based on stakeholder concerns to ensure that the end policy outcomes are reflective of these concerns and the objectives desired.[1]

Finally, it is important to remember that, as stated in the guidelines, coherent approaches to FFSR provide benefits to just transition. This includes anticipating negative and positive impacts on employment from subsidy reforms, ensuring social protection for those who may be exposed to job losses or the need to retrain, and including workers and employers equally in the design processes.

[1] This is not to suggest that subsidy reform is not the focus, but that the nature of this reform will be adapted based on stakeholder input. If stakeholders come out with concerns about reform, governments can look to ways to achieve FFSR, while adapting the FFSR process to address stakeholder concerns directly or through complementary policies (e.g., energy-efficiency incentives).

3.0 Creating Budgetary Space for Transition

As mentioned, one of the key contributions that FFSR can make to just transitions is through the creation of the budgetary space needed to finance transition. There have been a number of calls to better orient finance towards investment that will drive decent jobs and promote economic diversification and just transition policies, recognizing the financial requirements for transition (International Trade Union Confederation, n.d.).

There is much focus on the need for directing public and private investment to low-carbon and sustainable outcomes, and also the significant requirements for climate change. OECD has projected that the scaling up of developed country pledges for climate finance will total as much as USD 67 billion by 2020, but that still only represents two thirds of the required USD 100 billion goal (OECD, 2016), with uncertainty about the potential for private finance. Compounding this is that this commitment is only for addressing climate change, with no guarantee that this finance will also support just transition objectives (although this is certainly the hope of many countries). Individual country estimates for just transition mentioned earlier in his brief have also reached the billions of dollars, but it is unclear how much of this is infrastructure and how much is for worker supports.

Regardless, we know three things:

4) The scale of finance required is not known but is expected to be in the order of many billions of dollars.
5) Developed country contributions to international climate finance, even when coupled with private investments, are not guaranteed to provide the scale or targeted supports required to support just transition.
6) As mentioned earlier, fossil fuel subsidies total at least USD 425 billion per year, which, if removed, could go a long way to financing just transition.

This is why FFSR can be such a fundamental tool for financing just transition. We have already noted the way in which fossil fuel subsidies can act as a negative carbon price, while their removal helps drive the types of investments that are desired in a just transition. At a time of austerity in many regions of the world, the budgetary space required for investments in worker supports, education, health and social programming can place pressure on public budgets and strain the political economy and public support for just transition if the financing is not in place to achieve the desired objectives.

Removing direct public subsidies for fossil fuel energy production and consumption can free public funding for more targeted investments in just transition. At the same time, removing subsidies in the form of uncollected public revenues (e.g., elimination of tax breaks for fossil fuel production) generates new finance for just transition.

By removing/reforming subsidies to fossil fuels, it is possible to open up a domestic financing source for just transition. These new-found domestic sources for finance can also be leveraged to attract private and international climate financing sources (e.g., Global Environmental Facility, Green Climate Fund, etc.) by demonstrating domestic commitments to transition that can help indicate a country's motivation to achieve its goals with respect to just transition, and create a more attractive investment climate for other investors.

4.0 Case Studies: FFSR as an Asset to Just Transition

The following case studies look at examples of how FFSR is implemented in individual countries; how the process was adopted; the economic, social and environmental impacts; and how the outcomes and implementation process have been consistent, or not, with the principles and objectives for just transition. They also intend to provide some guidance for other countries that are looking to integrate FFSR and just transition with the green economy.

4.1 Morocco

Morocco has enjoyed stable economic growth and prosperity in the past few decades, elevating its population's standard of living. In tandem with its economic growth, Morocco's population has increased, in parallel with its national rate of urbanization (Schinke et al., 2016). Supplementing Morocco's economic and population growth, the total demand for energy increased by 60 per cent between 2000 and 2011, with an estimated 7 per cent annual increase in electricity demand (IEA, 2014; Africa Development Bank, 2017). The per capita electricity consumption remains relatively low, at 850 kWh; however, it is expected that by 2030 electricity demand will increase to 2,000 kWh and 3,000 kWh per capita. The highest users of electricity are the industrial (43.6 per cent), residential (32.8 per cent) and commercial (including agriculture) (22.4 per cent) sectors (Garcia et al., 2016).

To meet its energy demand, Morocco imports 90 per cent of its energy needs, with a small level of local production of petroleum products. The energy mix in the country is primarily derived from oil (67.6 per cent), coal (16.1 per cent) and, to a lesser extent, biofuels and waste (7.4 per cent) and natural gas (5.7 per cent). In terms of energy consumers, transport, industry and residential and commercial sectors take up 33.2 per cent, 26 per cent, and 20.4 per cent, respectively, of the end-users (Schinke et al., 2016: 2016 figures). In 2012, electricity generation constituted 16.5 per cent of energy consumption in the country, which is primarily derived from coal fuel (43 per cent), followed by oil and natural gas, with industrial and residential sectors as the largest users of electricity (Schinke et al., 2016; Garcia et al., 2016).

As a net importer of fossil fuels, Morocco has had to wrestle with the balance between subsidies and international market prices. Between 1995 and 2000, fuel products were under a price indexation system, implemented to adjust local fuel prices against international market prices. By 2000, this system was terminated, as it became politically difficult to sustain due to high oil prices. This led to reintroducing fuel subsidies in the country (Verme, El-Massnaoui, & Araar, 2014). Since 2000, the gap between international oil prices and local prices grew substantially, and with it the amount of public money diverted to subsidies. By 2012, fuel subsidies amounted to 6.6 per cent of the national GDP (Schinke et al., 2016).

By 2013, increases in the international fuel prices led to the partial indexation on petroleum products as a way to address the increased pressure of subsidies on the economy. The indexation, however, had two exceptions: butane and the price of fuel for the national energy and water company (the Office national de l'électricité et de l'eau, or ONEE).[2] At this point, subsidies to ONEE amounted to USD 577.8 million, and comprised 13 per cent of the total subsidy costs in the country. More specifically, the subsidy to ONEE was 154 per cent of the sale price, illustrating the gap between the international market prices and those paid by ONEE's generators. ONEE was paying approximately 40 per cent of the market price (Gagnon-Lebrun & Touchette, 2016).

By 2015, subsidies to gasoline and industrial fuel had been eliminated, except for butane and direct transfer to ONEE. Through the reform introduced by Morocco, between 2011 and 2016, the total subsidy amount to petroleum products reduced from USD 5,220 million to USD 1,132 million (Gagnon-Lebrun & Touchette,

[2] Subsidies to butane were maintained, as a large percentage of the Moroccan rural and poor population depend on butane for cooking and other necessities, such as lighting. Removing subsidies on butane would affect the vulnerable population the most, so the Government of Morocco is currently analyzing how best to phase out, if at all, the butane subsidies and avoid unintended consequences. The Government of Morocco and ONEE signed an agreement for three years to support ONEE's deficit and compensate for subsidy cuts in fuel oil, as well as investment in much needed electrical infrastructure in rural areas (The Economist, 2015).

2016).[3] Moreover, though direct transfers to ONEE were kept, electricity prices increased in 2015 after a fixed rate since 2009. However, this did ignite protests across the country. To manage the price increase, a short-term independent regulatory energy authority was created, which sought to improve cost transparency and market openness by reflecting production value (Garcia et al., 2016).

As a result, since 2014, FFSR has created the fiscal space for the government to redistribute a portion of the funds and invest in renewable energy. By investing in renewable energy, the country is addressing a number of issues, such as energy dependence, job creation, skill development, research and development, reducing GHG emissions and lowering electricity rates. Ultimately, the country aims to utilize FFSR as a key instrument to transition its economy to a low-carbon economy, while achieving economic growth and increasing its population's well-being and prosperity. To demonstrate how, the following section provides information on how the Government of Morocco has utilized FFSR that is consistent with elements within just transition.

4.1.1 Policy Design

Under its Nationally Determined Contribution (NDC) to the Paris Agreement, the Government of Morocco committed to reducing both its reliance on fossil fuels for its energy needs and its energy consumption by 15 per cent by 2030. Its commitments are to be achieved in part through reducing fossil fuel subsidies. Based on an IISD study, by introducing FFSR alone, Morocco can reduce emissions by 6.60 per cent from business as usual by 2030 (Terton et al., 2015). As such, phasing out fuel subsidies proves to be a significant instrument not only for creating a fiscal space for social or environmental programing, but also for reducing GHG emissions.

Subsidy reform is just one of a number of policy levers at play in Morocco. As a way to reduce its reliance on fossil fuel energy in a sustainable manner, the Government of Morocco has developed a series of plans to support the transition toward decarbonizing its economy. Some of these plans include the National Sustainable Development Strategy, the National Energy Strategy, the Low-Carbon Development Strategy and the Urban Public Transit Improvement Program (Kingdom of Morocco, 2016). One of the most important plans for Morocco's energy future is its National Energy Strategy, which aims to increase power generation in the country through renewables with investments amounting to USD 13 billion by 2030. In addition, under its NDC, an estimated USD 49 billion in investment in sustainable energy is noted as part of the country's mitigation actions to reduce GHG emissions. Ultimately, Morocco seeks to generate 42 per cent of its electricity from renewable sources by 2020, increasing to 52 per cent by 2030.

A number of ministries worked together to develop these plans, including the ministries of Economy and Finance, and of Energy, Mines, Water and the Environment (MASEN). As well, a number of new institutions were established to promote renewable energy and necessary enabling conditions for investments. These institutions include Agence Marocaine pour l'Efficacité Énergétique (Moroccan Agency for Energy Efficiency), the Moroccan Agency for Solar Energy and the Société d'Investissements Énergétiques (Energy Investment Company). In addition, the Government of Morocco created the Energy Development Fund, with an initial envelope of USD 1 billion, equivalent to 1.1 per cent of its GDP (Gagnon-Lebrun & Touchette, 2016).

In renewable energy alone, the country is investing in the solar power (CSP) project, NOOR. NOOR is a project set to generate 2,000 MW by 2020 to be constructed in five sites: NOOR Ouarzazate, NOOR Tafilalt and Atlas, NOOR Midelt, NOOR Laâyoune and Boujdour, NOOR Tata, in addition to solar power stations in low-cost areas (Garcia et al., 2016). In addition to the CSP projects, Morocco will also invest in other renewable energy such as wind, biomass and micro-hydro dams (Garcia et al., 2016).

4.1.2 Outcomes of the FFSR

Morocco is already witnessing fruits from its low-carbon mandate, with international commitments to reduce emissions, internal ministerial coordination to guide the process to decarbonize the electricity sector and opening a fiscal space to finance renewable energy projects in the country.

[3] It is important to note that between 2011 and 2012 the total amount in fuel subsidies rose from USD 5,220 million to USD 5,788 million; however, subsidies were reduced by almost half from 2013 to 2015, with a minor reduction in 2016.

4.1.2.1 Economic Impacts

The Moroccan economy has benefited from subsidy savings on fuel, despite the current subsidies on butane and direct transfers to ONEE. Moreover, its transition to a low-carbon economy will benefit from its investments in renewable energy. For example, in relation to NOOR CSP, MASEN estimates that, in a 50 MW CSP with an investment of USD 365 million, the added value in the local economy would be between USD 101.11 million and USD 139.99 million (Garcia et al., 2016).

4.1.2.2 Social Impacts

Investments in renewable energy will directly support job creation in Morocco, a country that faces a 9.7 per cent unemployment rate (Garcia, 2016: 2016 figures). By 2020, MASEN estimates that job creation in the renewable energy sector, in tandem with jobs in energy efficiency, will have positive growth, contributing to an improvement in livelihoods in the country. Table 2 reflects job creation in the renewable sector by 2020.

Table 2. Jobs created by 2020 in the renewable energy and energy-efficiency sectors

Sectors	Job Creation	%
Renewable energies	13,300	↑ 26.55%
CSP	6,100	↑ 45.86%
Solar photovoltaics	4,700	↑ 35.34%
Biomass	1,300	↑ 9.77%
Wind	1,100	↑ 8.27%
Micro-hydro	100	↑ 8.27%
Energy efficiency	36,800	↑ 73.45%

Source: MASEN (2013) in Garcia et al., 2016

Public investments in renewable energy will also result in secondary jobs, where the private sector will respond with job creation in project development, installation, management and maintenance of renewable energy capacities.

The construction of Ouarzazate I employed over 2,000 workers in both the public and private sectors, and an estimated 250 men and women will be directly involved with the management of the station for the next 25 years. The construction of NOOR Ouarzazate II and NOOR Ouarzazate III project a local integration rate of 35 per cent, ending isolation for several neighbouring villages, opening up new economic opportunities such as tourism and creating overall increased energy access. The construction of these stations will further increase employment in the sector, both direct and indirect, in the short and long terms (Garcia et al., 2016).

Wind farms also contribute to the economy and job creation: the Tarfaya wind park not only created direct employment, but also facilitated the road installations. Local communities also directly benefit from the Tarfaya wind farm through business tax, as well as skills training and increased capacity related to wind energy for community members. Another wind park in the Jbel Khalladi site will foment the creation of 300 jobs at peak periods. This project, when complete, will generate 850 MW and support industrial integration into renewable energy projects, such as local production of wind turbine components (Garcia et al., 2016).

As noted, increased skill development in renewable energy will be a direct benefit for local communities. The Government of Morocco has extended financial support to tertiary education to foment skills and research in renewable energy. Renewable energy projects, such as Innotherm, InnoPV and InnoWind, will support research and development in universities, increasing cooperation between the private sector and universities (Garcia et al., 2016).

Garcia et al. (2016) does note that to take best advantage of employment opportunities, countries such as Morocco should be "opening the low voltage electricity market and promoting RE applications to transport and industry," which will create increased employment opportunity.

4.1.2.3 Environmental impacts

Morocco has completed the first phase of the NOOR-Ouarzazate CSP Project. Once completed in 2018, the project will have a 580 MW capacity, resulting in a reduction of 2.5 million tonnes of oil and lowering the country's dependency on imported fuels, while also contributing to reduced GHG emissions. It is expected that other renewable energy projects will further contribute to GHG emission reductions, lead Morocco to energy security and lower its dependence on fossil fuels.

4.1.3 Key Lessons

The Government of Morocco has phased out many fossil fuel subsidies in a manner that has not only addressed budgetary constraints, but also as a planned transition to support environmental commitments, such as the Paris Agreement. In addition, the phase-out of subsidies has been in tandem with investments in renewable energy, which aim to reduce the country's reliance on fossil fuels, provide affordable, sustainable electricity to its end-users and bring electrification to remote villages. Moreover, the policy planning has been in consultation with various ministries, taking into consideration potential direct and indirect impacts to various sectors and social groups.

Though not explicit, elements of just transition are embedded in the planning process, including coherent policies across economic, environmental, social, education/training and labour portfolios. Moreover, the policies were designed to reflect Morocco's reality and how best to increase energy security, reduce its reliance on fossil fuels and reduce GHG emissions. In doing so, it contributes to its commitment to the Paris Agreement, and the international community has welcomed its efforts. Moreover, the country is serving as an example to other countries, through its NOOR CSP and other renewable energy projects. Though the transition has not been without its bumps, it is bearing fruit for the low-carbon transition.

4.2 Mexico

As a net exporter of crude oil, Mexico's economy has benefited from its oil and gas sector, particularly in the years where the cost per barrel surpassed USD 100. During these years, the Government of Mexico had a revenue surplus, which facilitated the reinvestment of the monies into subsidies for local fuel consumption prices and oil production, given Mexico imports most of its refined oil. As such, transport fuel subsidies became part of the fiscal environment in Mexico. Subsidies on fuel prices were applied to reduce international market price fluctuation of gasoline and diesel. However, over the years, these subsidies significantly contributed to public debt, particularly when the cost of oil went down in the international market. By 2011 fossil fuels subsidies constituted 1.95 per cent of Mexico's GDP, where gasoline and diesel had 1.01 per cent and 0.32 per cent, respectively (Arlinghaus & van Dender, 2017).

By 2011 the public debt was growing, and as a way to address the mounting debt, fiscal reforms were introduced, including fuel subsidy reforms. Between 2010 and 2015, transport subsidies were removed gradually, minimally increasing the price of fuel by 0.9 per cent (average) on a monthly basis. Despite having a total price increase of 43 per cent within the five-year period, it did not stir any public or sectoral upheaval (Scott, 2017). When President Enrique Peña Nieto came into power in 2012, however, public debt was at 37 per cent of Mexico's GDP. Peña Nieto introduced the 2013 energy reform to address public debt and inefficiencies in one of Mexico's biggest sectors, specifically in the state-owned oil and gas producer and distributor, PEMEX.

By 2014 and 2015, as international fuel prices increased, Mexico witnessed the devaluation of its Mexican peso against the U.S. dollar. As a way to contain the growing gap between international and local fuel prices, the government maintained regulation on the local prices as well as the cost of production, and the Ministry of Finance set fuel prices on a monthly basis. However, as part of the energy reform, in 2016 fuel prices

would slowly be liberalized, culminating to the full removal of fuel transport subsidies by 2018 (Arlinghaus & van Dender, 2017). This included the market liberalization of fuel distribution players, stripping PEMEX of its monopoly on distribution, while it continued to hold asset ownership on fuel transportation and storage facilities.

With new players in the local market, for the first year of implementation (2016), the Ministry of Finance regulated prices to stay within a price band,[4] set at +/- 3 per cent of December 2015 fuel prices (Arlinghaus & van Dender, 2017). In addition, the Ministry of Finance applied a complementary rate to the fuel tax as a way to keep prices within the band. By the beginning of 2017, the Government of Mexico introduced an increase in prices as part of energy reform, primarily to close the gap between international and local fuel prices. Therefore, the government announced to the public that, by the beginning of 2017, the price of transport fuel would face an increase between 14 and 20 per cent (Brooks, 2016).[5]

4.2.1 Policy Design (Previous and Current Administrations)

Subsidy reform before and curing the current Peña Nieto administration were implemented as a way to reduce public debt rather than to reduce GHG emissions, decarbonize the economy or reform the public budget. As such, there was little to no stakeholder consultation conducted, and there were no complementary policy instruments to support significantly affected transport fuel consumers (e.g., industry or vulnerable households), nor was a fiscal space created to redirect fuel subsidy monies toward investment or incentives in renewable energy or sustainable transport alternatives.

One of the major differences between pre- and current Peña Nieto administrations is the phasing in of subsidy removal. The previous administration introduced a smoother price increase of fuel where end-users were not significantly affected, as it was carried out in at a manageable and predictable pace, despite amounting to twice the increase in price. Under Peña Nieto, 2017 introduced a sharp increase in price, where the current administration stipulated that the increase in price was to reflect adjustment from regulated to international market prices (primarily fuel import from the coastal gulf border with the United States). In addition, under the previous administration, PEMEX still had upstream and downstream monopoly of transport fuel, while the energy reform under Peña Nieto brought in new players that are able to introduce different prices within a price band at the pump coupled with liberalization in specific areas in Mexico, primarily those bordering the United States. This resulted in a rapid, sharp price increase, significantly affecting end-users and leaving little to no time to adjust. Mexico conducted this reform at a time when the public budget was under severe stress and oil prices were high, which would have been a limiting factor compared to other examples such as the Netherlands (where the sector was still relatively stable) and Indonesia (where oil prices were low). Regardless, the results indicate that the later reforms were conducted in a manner that left potential for negative social impacts and public reaction, something that may have been avoided if a more proactive engagement process had been conducted with just transition objectives considered as part of the reform process.

4.2.2 Outcomes of the FFSR

The energy reform included the end of PEMEX's monopoly on the distribution of transport fuels and opened the market to private and international competitors. On fiscal reform, the fuel price now reflects the international market prices, production, distribution and storage costs, marginal costs of each company, cost of refinement, goods and services tax and the exchange rate between the U.S. dollar and the Mexican peso (Secretaria de Hacienda y Credito Publico, 2016; Corona, 2016a). This reform was reflected in the new fuel prices introduced by early 2017. The new changes removed the heavy subsidization of fuels, bringing the prices closer to true market value. Therefore, with higher prices, consumers' choices may shift toward more cost-effective and more environmentally sound consumption on transportation (e.g., public transportation or car sharing). On the production side, removing subsidies on energy generation introduces a more level playing field for alternative, clean energy generation options for consumers. It is too early to tell the impact this may have on air pollution or GHG emissions, but anything that limits fossil fuel consumption could be seen as a potential environmental positive.

[4] IISD explores the mechanism of price caps and floors for fuel pricing in the report *How to Respond When Prices Go Up* (McCulloch et al., 2017).

[5] There were tiered prices for gasoline and diesel, during both regulated and unregulated prices. Therefore, by January 2017, premium gasoline received a 20.1 per cent increase, gasoline a 14.2 per cent increase and diesel a 16.6 per cent increase (Brooks, 2016).

4.2.2.1 Economic impacts

Given the quick, sharp increase in fuel prices, demand decreased and affected net sales and associated public revenues. The Finance Ministry noted in May 2017 that from January to April 2016, there was a 47.2 per cent reduction in public revenue from the Special Tax on Production and Services, compared to April 2016. Following the implementation of energy reform, an estimated MXN 25,000 million have been forgone in revenues (Albarran, 2017). However, given that the biggest industry affected was the transport sector, there was a marginal macroeconomic impact, and Mexico actually enjoyed economic growth of 2.8 per cent in the first 2017 quarter. Also, from the introduction of the energy reform, new industries have been emerging, resulting in lower energy costs and increasing industrial competitiveness (Albarran, 2017).

Moreover, the Comisión Reguladora de Energía noted that, as part of the energy reform, the fiscal reform on transport fuels aimed to incentivize industry investment, as the regulated price did not reflect the nature of international price fluctuations and blocked any signals to industry to properly invest (Corona, 2016a). Based on a Comisión Reguladora de Energía analysis, price liberalization will send proper market signals to industry to invest. Already, Mexico has witnessed foreign capital investment in its energy sector, where investments in infrastructure are starting to support upgrades to the aging oil and gas infrastructure in the country (Stillman, 2017).

New industry players in fuel distribution face up to 40 per cent in corporate taxes. In addition, competition among the new distributers has maintained levelled prices at the pump (Corona, 2016b). In addition to new players in the transport fuel market, there is a rise in the underground market. Fuel theft is carried out by digging up pipelines and stealing tanker trucks, and between January 2016 and July 2017 fuel smuggling rose by 70 per cent (Stillman, 2017). Fuel smuggling costs the already financially fragile PEMEX more than USD 1 billion a year (Stillman, 2017).

4.2.2.2 Social Impacts

Due to the sharp increase in fuel prices in early 2017, civil unrest ignited (Arlinghaus & van Dender, 2017). The marches were protesting "*el gasolinazo*," as gasoline hikes lead to various impacts, such as food shortages, in the country. The hike in fuel interrupted the distribution of basic foods such as grains, fruits, vegetables and meats. Protests were held across the country, demanding the resignation of President Peña Nieto.

Fearing job loss, petroleum workers have started opposing the reforms. In April 2017 the petroleum workers union in Mexico blocked private fuel distribution company access to the PEMEX storage and distribution terminals in four areas of the country (Carriles, 2017). This branched from the previously negotiated rules that allowed private distributors to use their own transportation resources, such as truck drivers. The union negotiated with PEMEX and the end result was that private distributors would have to use not only PEMEX facilities but also employ PEMEX workers to deliver fuel to their gasoline stations.

Given that PEMEX is the sole oil producer in the country, there have been no job losses in the upstream industry. All fuel distributors use PEMEX-owned downstream infrastructure and employees (as noted above, even including drivers), therefore, minimal job loss was experienced in the transition to liberalization of downstream services in the country. However, given the experience of the unrest, it appears that some of the changes made to accommodate worker concerns happened after the fact, as opposed to during the design and implementation process of the reforms. Moreover, though the direct impact is on the high earners who spend a higher percentage of their income on transportation (vehicle owners), vulnerable households are also affected. Specifically, removal of subsidies results in disproportionate impacts on vulnerable households without proper compensation, as the cost of the standard of living goes up, including public transportation and food prices (Scott, 2017). In poor households, six out of 10 Mexican pesos are dedicated to these goods and services (Vergara Gonzalez & Huerta Quiroz, 2017).[6] By early 2017, the price of basic consumer goods increased over 5 per cent from the year previous (Vergara Gonzalez & Huerta Quiroz, 2017).

[6] Though the minimum wage increased by 9.5 per cent, it was insufficient to compensate for the higher prices of public transportation and basic consumer goods (Vergara Gonzalez & Huerta Quiroz, 2017)

4.2.3 Key Lessons

A number of lessons can be derived from Mexico, and why its FFSR resulted in civil unrest. To start, the country was faced with a difficult budgetary constraint, which led the government to liberalize the oil and gas sector, which led to a hike in oil prices and the quick phase-out of subsidies. The decision to increase oil prices up to 20 per cent was carried out with limited engagement process, particularly with no integration of social focus reforms, notably to vulnerable households.

Despite the hike in fuel prices, the government will have the potential to achieve reduction in its national debt, as seen in the first year. With a decrease in fuel demand, a shift in consumer choice to more cost-effective, less polluting options may lead to a reduction in emissions, and so far job losses have been minimal. Having said this, the social impacts may outweigh some of the budgetary gains. In the long term, impacts could be positive; however, the transition is creating social disruption.

Through a just transition lens, a better-planned process could have made the transition smoother. This would include addressing workers' and vulnerable households' concerns upfront rather than after the fact. Though focused on addressing an increasing national debt, in hindsight, the decision-making process could have been handled better, employing a holistic approach by engaging with different social sectors and understating the direct and indirect impacts of the reform.

4.3 Argentina

Fuel subsidies in Argentina follow the path of various countries. With the goal to keep domestic oil prices low by creating an artificially low domestic price, Argentina created a high dependence on fossil fuels for various energy uses, including transport, natural gas and electricity. Transport, agriculture, and residential and industrial sectors are all heavily subsidized (Maurtua Konstantinidis, 2016). To illustrate further, Argentina produces an estimated 75 per cent of its electricity from heavily subsidized fossil fuels (Maurtua Konstantinidis, 2016).

Looking back at recent history helps to clarify how Argentina relied heavily on fossil fuels subsidies. In 2002 Argentina fixed the price of natural gas and electricity, changing the original value of tariffs from USD to Argentine pesos at an exchange rate of 1 USD to ARS 1, and revoked any price adjustments and indexation mechanisms for any existing agreements with utility companies (Muras et al., 2015). As Argentina fixed its tariffs on energy utilities, it experienced a reduction of local oil production. Faced with a growing demand for energy, the government subsidized the cost of imported fuel in order to effectively supply the growing demand (Muras et al., 2015).

This had a ripple effect on the distribution and transmission companies, where salaries faced a declined value due to the increased inflation rate, as the Argentine peso fell to less than 30 per cent of its former value when it abandoned the pegged currency system. In addition, utilities witnessed financial losses on infrastructure investments, as many of these were made in loans arranged in U.S. dollars during currency parity (Pollitt, 2008). Further, with few to no revenues and increasing operating costs, utility companies forwent any investments on infrastructure necessary to supply reliable energy to its customer base and consequently decreased the quality of services for end-users. This situation amplified the government's economic responsibility to financially compensate the increasing operating costs of utility companies (Muras et al., 2015). Moreover, by 2015, after over a decade of fixed electricity tariffs, residential consumers paid less than 10 per cent of the average electricity generation costs (Parkes, 2016). Subsidies to the energy sector constituted 0.2 per cent of GDP in 2004 and 2.9 per cent of GDP in 2015, significant growth over a decade. In addition, energy subsidies in 2014 were an estimated 71.7 per cent of all subsidies in the country (Muras et al., 2015).

Over a decade and a half of subsidizing fossil fuels has led to negative economic consequences for Argentina, and as a result many energy companies either liquidated or left the country. Previous governments attempted to reform fuel subsidies but in a manner that was too fast and with steep price increases, affecting small businesses and households the most and leading to civil unrest (Maurtua Konstantinidis, 2016).

Fast-forwarding to 2015, Argentina came into the new presidential administration of President Mauricio Macri. The following year, President Macri vowed to phase out fossil fuel subsidies and align transport fuel prices with international markets. The administration introduced a new law on renewable energy as a way to address electricity challenges in the country, with a commitment to install capacity for 10,000 MW from renewable energy.

4.3.1 Policy Design

In January 2017 the government introduced Decree 9, which seeks to increase energy diversification in the country through renewable energy, with the aim of reducing emissions, creating local jobs and increasing energy security (Rosenfeld, 2017). The government is still identifying parameters to set pricing, trading rules and guidelines for bilateral contracts between consumers and generators (Rosenfeld, 2017). On the consumer side, Law No. 27,191 sets out binding renewable energy targets for electricity users with loads of 300 MW to purchase 8 per cent of their energy use from renewable energy by the end of 2017. The target has a gradual increase of 4 per cent every two years to reach 20 per cent by 2025 (Parkes, 2016).

On the fiscal adjustments, the Macri administration removed exchange rate controls, resulting in a depreciation in the official exchange rate, while starting the gradual removal of energy and transport subsidies. The newly created fiscal space is used to reduce export and income taxes and increase support to vulnerable households affected by the FFSR (Parkes, 2016). In February 2016 the Ministry of Energy and Mining began to increase energy prices, with the goal to reduce the gap between generation and final costs to users. Figure 3 illustrates the growth in subsidies up to 2016, and the proposed scaled removal of subsidies by 2025.

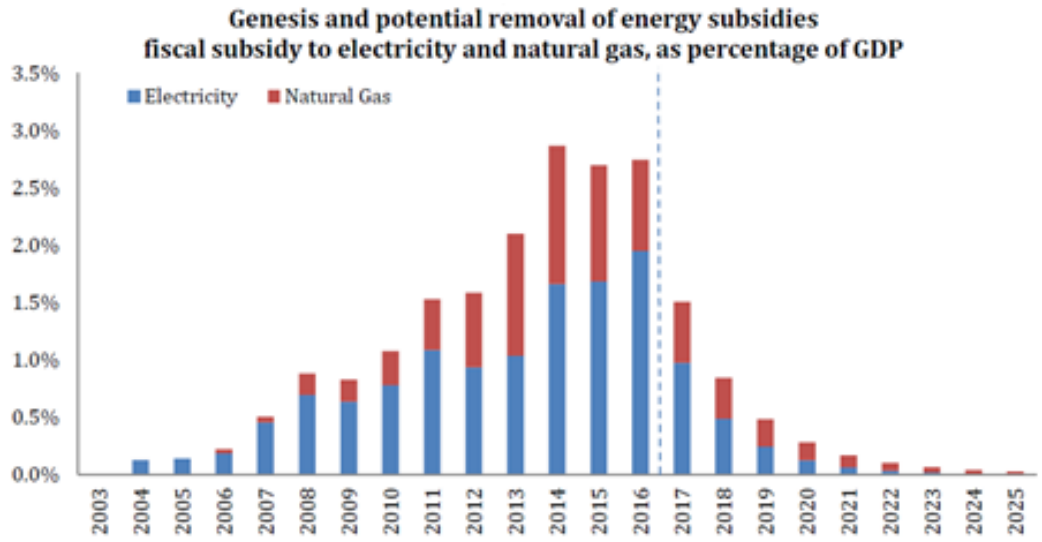

Figure 3. Impact of potential removal of subsidies in Argentina

Source: Parkes, 2016

4.3.2 Outcomes of the FFSR

Though there was an increase in energy prices, many factors contributed to the increase in energy subsidies, such as devaluation of the Argentine peso and investment in the sector to attract investment (El Economista Diario, 2017).

The scheduled reduction in subsidies started in 2017, so it is only possible to discern immediate short-term impacts. The government aimed to reduce subsidies by ARS 135.834 million, a 36 per cent nominal cut. In tandem with a reduction in energy subsidies, in the beginning of 2017, the government increased electricity tariffs by 39 per cent, with a new increase scheduled to be released in November (Colombres, 2017). Moving toward 2018, the government plans to reduce subsidies further (Reuters, 2017). This will result in an 18.7 per

cent reduction in subsidies compared to 2017 figures, amounting to ARS 28.630 million (Arbia, 2017). In terms of natural gas prices, every six months gas tariffs will increase by 10 per cent, as a gradual move to completely eliminate natural gas subsidies by 2019 (Colombres, 2017).

4.3.2.1 Economic Impacts

In August 2017 the Ministry of Finance announced that there was a 17 per cent decrease in public debt compared to 16 months previous (Arbia, 2017). Since August, the prime fiscal deficit dropped from 3.2 per cent to 1.9 per cent of GDP. This reduction entails, for the most part, the gradual reduction in subsidies for the energy sector (Arbia, 2017).

In addition, given the advancements in renewable energy technology and incentives from the government, electricity supply from renewables are accessible at a lesser price in the wholesale market than from the national grid operator, CAMMESA. It is expected that a power purchase agreement market of 1,000 MW will be opened in Argentina (Rosenfeld, 2017).

4.3.2.2 Social Impacts

In April 2016 the government increased the demand price for natural gas, where end-users were faced with a substantial price increase. Given the lack of mandatory public hearings, the Macri administration faced scrutiny and was legally challenged by consumer associations and opposition political parties. The judicial challenges went all the way up to the Supreme Court, where on April 16, 2016 the gas price hike was dismissed for residential users, and the government was ordered to hold public hearings to ensure public participation in the decision-making process. By October 2016, the government held public hearings, and based on the public consultation it slightly increased natural gas prices (Colombres, 2017).

With the gradual decrease of energy subsidies, the tariffs are going up as a way to bridge the gap between generation and consumption use. In doing so, the government is slowly passing down the investment and operating costs to consumers. However, taking into consideration the economic burden on vulnerable households, by 2018 the government will introduce a total of ARS 65,000 million to support social programs and provide ARS 103,184 million to energy companies as a way to recover costs that would not be covered under consumer tariffs (Colombres, 2017). This means that, under increased prices, consumers will cover 61 per cent of the wholesale costs, while social subsidies will support the access of 4 million consumers to energy at a lower price than the general rate (Revista Petroquimica, 2017a; Colombres, 2017). In terms of job generation, it is estimated that the new renewable energy law could create an estimated 60,000 direct and indirect jobs in the sector by 2020. This is based on the 3,000 MW installed capacity the government has decreed in its law (Diario Jornada, 2015; Revista Petroquimica, 2017b).

4.3.3 Key Lessons

Argentina is slowly coming out of almost two decades of heavy energy subsidies and fixed energy tariffs. Already, the economy is witnessing a decrease in the public debt, and steps are being taken to address the negative impacts of increased energy tariffs on vulnerable households. However, it is still too early to tell the impacts on job creation, both in the traditional energy sector and renewable energy.

Some lessons can be identified in the initial stages of fiscal reform. The first is that, despite the best intentions of addressing economic burden and raising tariffs to bridge the gap between natural gas production and consumption, there was little consultation with the public. This resulted in legal challenges, and the government was ordered to conduct its due diligence and consult with the public. On the same token, the government is planning on a gradual removal of subsidies, where an increase in tariffs will provide the investment money necessary to improve infrastructure and quality of services. Thus, it creates a demand for specialized services that will result in job creation. Second, the mandate to diversify the energy mix, where industrial end-users are required to purchase 8 per cent of their energy needs from renewables, are enabling conditions that will grow the renewable energy sector. Nonetheless, due to the early stages of the implementation of both subsidy removal and increased supply of renewable energy, there is not enough information about engagement between

government, utilities, independent suppliers and unions on job creation in Argentina to show how just transition will play into the planning and implementation process.

4.4 Indonesia

Indonesia's history of transport fuel subsidy reform has already been well assessed. IISD provides an in-depth study of the process in the report Financing Development with Fossil Fuel Subsidies (Pradiptyo et al., 2016). Prior to the institution of subsidy reforms, the Government of Indonesia set transport fuels at a fixed rate for consumption. This system had resulted in increasing subsidies over time as international fuel prices climbed and the consumption price of fuels remained fixed. At certain intervals, the government would adjust the price of fuel in a one-off manner, leading to sudden shocks for consumers, but still not dealing with the immediate or long-term subsidy issues, which would only become entrenched. See Figure 4 for a comparison between government prices and international market prices.

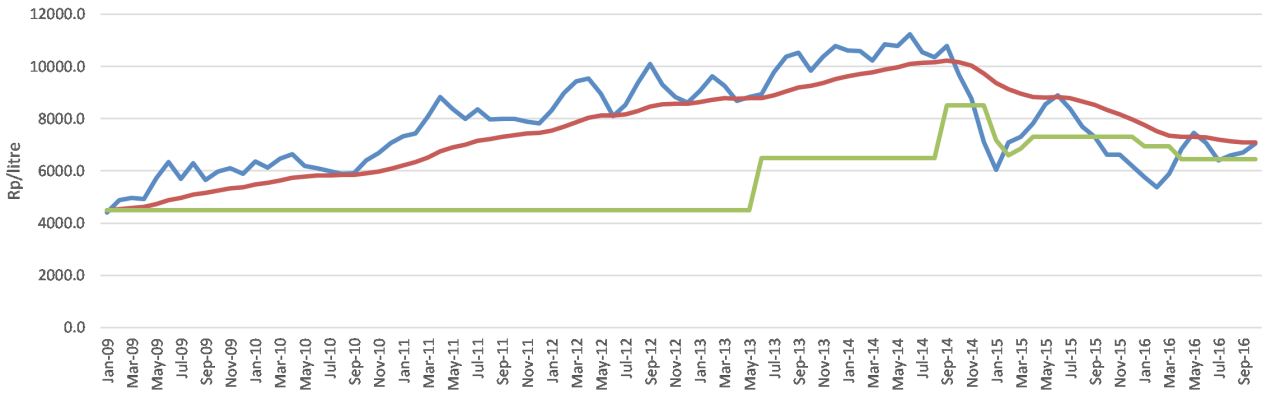

Figure 4. Comparison of international market prices for premium gasoline with government-regulated pricing, 2009–2014

Source: McCulloch et al., 2017

Recognizing the potential for this issue to only become more exacerbated over time, the government determined that it must enact fuel reforms that would eliminate what had become a massive structural subsidy in the fuel pricing system. President Joko Widodo (Jokowi) indicated well in advance of reforms that there was a need to end this expenditure and redirect funds to more productive purposes (Prasetyantoko, 2014).

The decision to reform these subsidies, which looked to amount to over IDR 200 trillion (USD 15 billion) in early pre-reform 2015 budgetary estimates (Pradiptyoet al., 2016) was not without notable risk. Discussions of fuel price reform led to significant protests for Jokowi's predecessor, Susilo Bambang Yudhoyono (The Economist, 2015). However, due to a combination of well-designed reforms, thoughtful implementation and, just as importantly, fortuitous timing (meaning that it occurred when global oil prices were falling), the reforms have thus far proved to have positive impacts. There are still cautions for the future to ensure that the reforms that were achieved are not subject to backsliding, but the Indonesian approach indicated that there is a way to enact subsidy reform that will deliver economic benefits as well as benefits for society.

4.4.1 Policy Design

The approach to subsidy reforms in Indonesia was complex, but also designed to achieve a relatively straightforward goal. The goal of the reforms was to more accurately reflect the market price of fuels in the price consumers paid at the pump, which would eliminate the subsidy that was created with the fixed market price. However, rather than just eliminate fixed prices, the government implemented a formula for price adjustment that would ensure more regular adjustment in the price than in the past and result in prices that are closer to the actual international market price.

The current mechanism, introduced in January 2015, is to apply a formula for the domestic price based on the international price. The current formula for premium grade is (McCulloch et al., 2017):

Expected Open Market Price (EOMP) = [(MOPS92 * 0.9842) * ER] + Distribution Cost + Taxes

The regulated market price for fuel is then set at the EOMP. MOPS92 is the Mid-Oil Platts Singapore price for 92 per cent octane gasoline; 0.9842 is an adjustment factor to account for the fact that premium-grade fuel (the regulated fuel in Indonesia) is only 88 per cent octane. ER is the average Bank of Indonesia exchange rate from the 24th to the 25th days of the previous month. Distribution cost is the amount announced each year by regulation to account for the cost of distribution of premium around the country; and taxes include a value-added tax (10 per cent) and fuel tax (5 per cent).

While a somewhat complicated equation, the outcome is that the cost of fuel is basically set at roughly the cost of fuel on the open market, plus distribution and taxes. This should result in non-subsidized fuel, but only if the fuel prices are set quite frequently. If fuel prices are adjusted daily, the subsidy will be next to zero. The longer the government waits between price-setting intervals, the higher the potential for a subsidy to re-emerge. However, the more frequently the government adjusts the price, the more it opens up to fuel price spikes and fluctuations, which can have negative impacts on the economy and energy access, particularly in countries that are used to having very controlled prices historically.

Indonesia had determined that it would set prices monthly. This kept prices stable for a month, but laid open the potential for major changes at the end of every month, as much as IDR 300–400 (McCulloch et al., 2017) if the adjustment had occurred regularly. Regular application of the mechanism has been a challenge, and comes with its own risks. However, there have been significant outcomes in terms of the reform from economic, environmental and social perspectives that have been beneficial, and indicate that just transition principles and objectives have been considered, even if it was not an explicit consideration.

4.4.2 Outcomes of the FFSR

President Widodo enacted fuel subsidy reforms as planned in 2014, with initial fuel prices for premium rising by more than 30 per cent (Taylor & Kapoor, 2014). The outcomes of this reform were immediate and had a significant impact on the state budget in particular that had ripple effects through the economy.

4.4.2.1 Economic and Industrial Impacts

Within the first year, the reform of transport fuel subsidies opened up roughly IDR 211 trillion (USD 15 billion) within the state budget (Pradiptyoet al., 2016). Some assessments of the economic impacts of reforms in Indonesia estimate that if subsidy-related revenues are used to compensate households for the impacts of reform, than GDP would remain similar to business as usual over the medium and longer terms (Asian Development Bank, 2015)

Over the longer term, there are concerns about the stability of existing pricing reforms; in particular, the shift from bi-weekly to tri-monthly (Hari, 2016) price setting (and infrequently thereafter) has the potential to allow subsidies to re-emerge over the long term.

From an industrial perspective, it is worth noting that the market pricing for higher-octane fuels has attracted competition within the fuel sector with Shell and Total entering the market (Hari, 2016).

4.4.2.2 Environmental Impacts

With the existing reforms, energy use is expected to decline by over 10 per cent in 2030 relative to a non-reform scenario (Asian Development Bank, 2015); however, the environmental benefits from fuel switching are muted somewhat, as coal is expected to be one of the alternatives. Overall the "combined effect of a decline in energy consumption and fuel switching is estimated to reduce CO2 emissions by over 9% relative to the baseline in 2030" (Asian Development Bank, 2015).

4.4.2.3 Social Impacts

Social considerations are where the impact of Indonesia's reforms can be strongly identified. In 2012, before the current government started to enact the fuel reforms, "Indonesia spent $36 billion on fossil fuel subsidies, but it only spent $3 billion on social assistance programs" (Asian Development Bank, 2015). Subsidies were initially in place to help ensure affordability for middle-income consumers, necessitating a need to address these impacts through alternative means. There is still some improvement needed in targeting benefits of subsidy reforms, but the government did hold true to its commitment to reallocate subsidies to spending that would be beneficial to society.

IISD analyzed subsidy reallocation in the report *Financing Development with Fossil Fuel Subsidies* (Pradiptyoet al., 2016) and identified from comparison of pre- and post-reform budget drafts that IDR 211 trillion in subsidies in the pre-reform budget was removed in the post-reform budget. Noticeably, there is higher investment in the post-reform budget in many socially linked areas, including IDR 34.7 trillion for regional transfers and villages, IDR 148 trillion for special programs to boost growth and reduce pverty and IDR 63.1 trillion for investments in infrastructure (Figure 5).

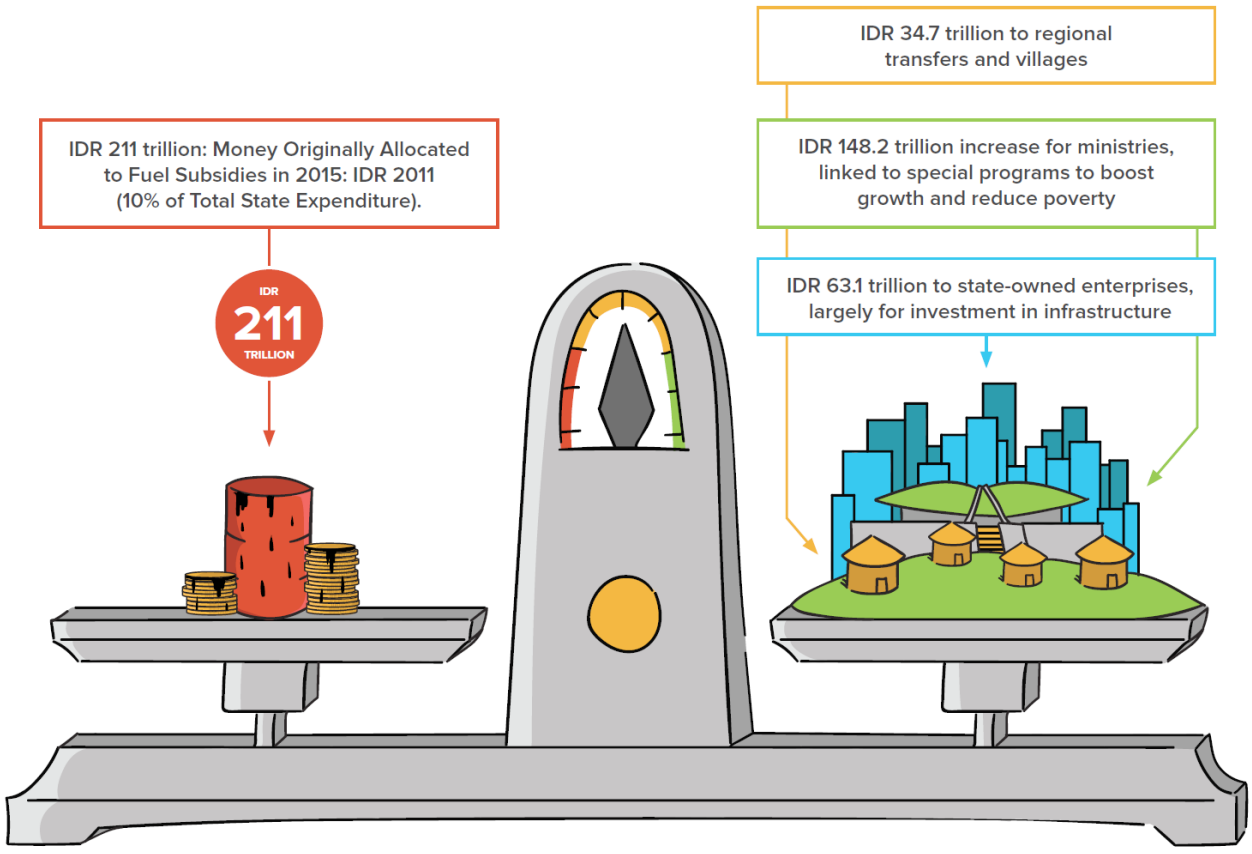

Figure 5. Reallocations in Indonesia state budget 2015 post-FFSR

Source: Pradiptyo et al., 2016

There were immediate protests and long line ups at fuel stations in Jakarta, as predicted; however, officials within government were very quick to highlight that savings from subsidy reform would be diverted to spending on infrastructure, education and health (Taylor & Kapoor, 2014). This directly connected the spending on fossil fuel subsidies to spending avenues that would directly benefit society.

In addition to the reinvestment mentioned above, the Government of Indonesia was also launching a universal health coverage program at the same time (Husar & Kitt, 2016). While not explicitly linked to the subsidy reform, President Widodo's push on social programming and investment in key social structures indicates

that the objectives relate to just transition were being closely considered in overall financial restructuring in Indonesia at the time. Smart card programs were introduced for education (24 million households), health (88 million households) and poverty reduction, all in parallel to subsidy reforms, indicating that each is a tool in an overall transition process (Jakarta Globe, 2014b).

Overall, the reactions of civil society organizations have been largely positive. IISD interviews with civil society organizations indicated near unanimous support for the reforms, and no organizations indicated that the previous subsidy regime was better for Indonesians (Pradiptyoet al., 2016).

4.4.3 Key Lessons

Studies linking the FFSR in Indonesia to employment impacts were difficult to obtain, so it is unclear the exact impact that these specific reforms have had on employment. Overall, Indonesia's unemployment rate is down in recent years (World Bank, 2017), but much further study would be required to understand the impacts of FFSR on employment in Indonesia.

What we do know is that, unlike other countries, a literature review does not indicate strong opposition from labour as an influence to or outcome of reforms.

We do see from this reform that there was a whole-economy approach to the process, and the president made a concerted effort to closely link economic and social reforms, a measure that was designed to build buy-in for reforms and diffuse any opposition before it could build up. Even today the president's approval rating remains high, at nearly 70 per cent (La Batu, 2017).

Indonesia's reforms did benefit from a fall in international market prices, making the timing opportune and allowing government to take credit for falling prices at the time subsidies were removed. Frequency and adjustment concerns over the reform mechanism remain a concern, particularly in light of rising market prices, which require the government to increase prices at the pump. The full evaluation of Indonesia's reforms and their effects on just transition will require a review in the coming years as international market prices fluctuate. However, the success of implementing reforms, and Jokowi's commitment to linking social and economic reforms, are good examples of how to utilize and successfully implement reforms as part of a bigger development plan.

4.5 The Netherlands

The transition that has taken place in the Netherlands is slightly different from the other examples presented for a few reasons. First, it is less a case of analyzing how FFSR has been implemented and affected people and more a case study of how a transition can take place in a fossil fuel energy sector, in tandem with well-targeted subsidies that are clearly part of a larger transition. Second, it is an example that focused on fossil fuel energy production, as opposed to fossil fuel consumption, as the main issue being addressed. Finally, the transition was also driven with employment as a centerpiece above all other arguments for transition.

Coal production in the Netherlands first began to increase to be a significant sector in the 19th century and expanded greatly at the beginning of the 20th century (Kasper, 2012). Dutch coal mines were located in the Limburg province in the southern part of the country (Figure 6) and were a major source of employment in the region as the sector grew.

Figure 6. Map of the Netherlands with Limburg and former coal mining area indicated

In the post-World War II period, the Netherlands saw coal production expand, then nearly phase out, and expand again. This had a significant impact on workers and has led to significant investment in transition, as well as debates about the preferred approach to managing the coal production sector. Accounting for 85 per cent of energy consumption prior to the Second World War, the share of coal in total energy consumption dropped to its lowest level in 1975 at 4.3 per cent (Gales & Hölsgens, 2017).

Following the discovery of natural gas, which would come to dominate domestic energy, there was also an indication of increasing costs for coal extraction in the Netherlands. One of the factors was that the easiest layers of coal to extract had run out, with extraction costs rising at a time when more economical energy options existed. Economic losses were also projected for the sector. Although there were variations on the severity of the projected effects on industry (Gales & Hölsgens, 2017), it influenced decision making in industry and government as they looked to plan for the future.

As a result, and out of concern for workers in the region, a plan was put forward in 1965 to outline the closure of several domestic mines in the region of Limburg (Gales & Hölsgens, 2017). A mix of privately and publicly owned mines in the Netherlands was affected by the closures, with eight private and four public mines closed between 1963 and 1974 (Kasper, 2012). Closures were closely managed and a plan was put in place to assist workers with the transition to alternate employment streams. Dutch State Mines, which was established in 1902 to manage mining of coal reserves in the Limburg province, played a critical role in the phase-out process, overseeing the closure of public mines and assisting workers through the closure process (DSM, 2016).

The costs of this approach to transitioning the sector between 1965 and 1990 were great: approximately EUR 11.6 billion (Caldecott, Sartor, & Spencer, 2017). These costs included a number of measures, including supports to workers as well as implementation of some fossil fuel subsidies. Overall, the focus was on developing a plan for workers as reliance on domestic coal diminished, but in a proactive fashion, looking to transition the sector before an economic downturn made the transition less manageable. While subsidies played a role, they were targeted and designed to assist transition away from coal.

4.5.1 Policy Design

One of the fundamental aspects of the government approach would be that "ending old employment would be linked to the creation of new jobs" (Gales & Hölsgens, 2017). As part of the process, State Mines created a re-industrialization department. Outside investors could seek workers through this department, helping workers

transition to new jobs. State Mines would bundle workers to ensure that the process was smoother and no particular segment of workers (e.g., older workers) was left out. Through this process, approximately 50,000 workers were transitioned from mining to alternative work, pensions or other bridging alternatives (Gales & Hölsgens, 2017).

The transition process was not without its own fossil fuel subsidies, as mentioned. The government committed to short-term support for coal production at mines that were to stay open during the overall process, even at an economic loss, while transition was underway. Some subsidies related to stabilizing the prices in the sector were put in place, while others directly related to transition away from coal. Rather than simply focusing on subsidies to industry to keep jobs in place in the sector, or support prices, they also focused on transition, with long-term employment goals in mind as prices were supported in the short term.

Anticipating questions about this approach, then Minister of Economic Affairs Joop den Uyl noted that this was not just a financial decision, but one that was connected to employment in the country, and that coal transition must be done humanely (Demijnen.nl, 2005). A speech given in December 1965 outlined three premises of the approach for the transition of the sector: first, that there would be no closures without reasonable prospects for other work; second, that there would be no closure without reasonable arrangements, where the interests of workers are ensured when resigned or resettled; and third, that there would be no closure without ensuring other mines could retain production at needed levels (Demijnen.nl, 2005). Over time, direct supports for coal prices and production were phased out while supports for transitioning the sector took up a greater portion of funds, as overall subsidy levels declined.

Specific measures, including subsidies, that the Dutch government took to support workers and transition in the sector included (Kasper, 2012):

- Subsidies on the price of buying land by existing and new industrial firms or by service firms that promote/drive new employment.
- Guarantees for loans to companies when a (new) company met the criteria of the restructuring of the area and its equity was a reasonable part of total assets.
- Establishment of offices for national public services.
- Establishment of the DAF automobile factory in Born.
- Arrangements with privately owned mining companies. The contracts specified that these companies should invest the resources that were present at the moment of closure in principle in new industrial activities in the Netherlands, preferably in South Limburg.
- Information, advice and education on jobs, schooling and employment finding.

The running theme of all of these activities is that they are all directly targeted at worker transition, with the goal of ensuring that workers have opportunities in the economy and in their home region. So, while there were minor, short-term fossil fuel subsidies, there were also major investments in worker transitions, specifically, ensuring that there was investment in the region and that it was employment focused. Mine closures were also scheduled in a phased process to assist with the overall worker transition process.

4.4.2 Outcomes of the FFSR

Reconversion of the sector continued through 1990, when the eventual goal (to have local unemployment equal to the national rate) was finally achieved. While demand for coal eventually increased again in the 1970s after the reforms had begun, it was determined that reopening coal mines would not be beneficial for a number of reasons (including being socially difficult to justify after a massive transition). So while the Netherlands continued to use coal, it was imported.

4.4.2.1 Economic and Industrial Impacts

Estimations of the total impact of the reforms in the coal sector are difficult to fully quantify, but there are some figures we can use for guidance. The area affected was home to 530,000 people in 1960 and 636,000 in 2000

(Kasper, 2012). When the coal mine closures were announced in 1965, approximately 53,000 people were employed in the sector. In the end, the transition affected roughly 75,000 jobs (Caldecott, Sartor, & Spencer, 2017), a figure that represents 36 per cent of all jobs at the time (Kasper, 2012). From a peak of 58,000 full-time-equivalent (FTE) positions in mining in 1958, this number was reduced to 0 in 1974. However the overall number FTEs in South Limburg only decreased from 226,000 to 225,000 over the same period. So while 58,000 FTEs were lost in terms of mining jobs, only 1,000 overall FTEs were lost in the region.

Due to a strong economy resulting in a shortage of labour and the supports for workers that were provided, in the early years many miners transitioned earlier than planned, actually requiring hiring new miners for the temporary period, with many coming from the Mediterranean to work in still-open Limburg mines (Kasper, 2012).

While there was a high level of support for private investment, including the ability to access the transitioning workforce of the mines, some of these companies "proved financially unhealthy and unstable" (Kasper, 2012) and, exacerbated by an economic downturn, the economic situation deteriorated. The solution to this was to give provincial governments more freedom to develop and execute their own regionally focused policies. In this round of restructuring, the focus was not just on job retention and creation, but on ensuring that these jobs were sustainable.

Today the Limburg province is home to several high-value sectors, including life sciences, health services, chemical processing, logistics, tourism, business services, horticulture and financial-administrative services (Gales & Hölsgens, 2017).

Dutch State Mines itself continued on as chemical company DSM, reinventing itself as the sector transitioned and taking advantage of more lucrative opportunities, including now working on biomedical devices, nutritional products and thermoplastics (DSM, 2017).

4.4.2.2 Environmental Impacts

At the time of this phase-out, environmental concerns were not a major concern. The focus was almost entirely on employment impacts on workers, while also maintaining energy security (i.e., coal supply) throughout the transition process. In fact, the Netherlands continued to utilize coal for electricity in the subsequent decades, until developing emissions targets post-2000 that led to the closure of five coal-fired power stations from 2015–2017 with plans to close the remaining ones as part of a commitment to reduce emissions by 55 per cent by 2030 (Neslen, 2016).

4.4.2.3 Social Impacts

Overall, the employment rate for the affected region did not differ from national figures in the 1965–1972 period when most of the transition took place.

While there were points where they clashed with the government, organized labour in the Netherlands did not oppose the transition. There was an acknowledgement that there was a necessary transition in the sector, even if labour did not actively promote mine closure, with the union looking to make the most of the situation it was presented with (Gales & Hölsgens, 2017). The concept of replacing mining jobs with alternative employment was consistent with the process in neighbouring Belgium, where labour protests had been calling for the restructuring of sectors to favour workers (Delaet, 1988).

It was noted that there was a loss in social standing among miners who lost their jobs, with feelings of isolation and unrest for miners and their families. The lack of resources for these social impacts was noted, with most of the resources focused strictly on employment (Kasper, 2012). Despite these concerns, the early years of transition were widely considered a success.

In later years (second half of the 1970s), additional funds were put into social programming, but at the same time an economic recession had occurred and unemployment increased. As noted above, this led to a more

regionally focused, sustainable job approach that enjoyed more success. More resources were also put in place to support social programming. These included educational programming to eliminate illiteracy.

4.4.3 Key Lessons

It is impossible to know what the future will hold, and even after this 25-year reform process, unemployment rose again after 1990 due to economic conditions, and then decreased again in 1995 (Kasper, 2012). Long-term economic strategies have to be considered in all times, and Limburg is no exception. Subsequent development plans have been advanced to support employment in the region.

The economic value of the coal in the region has been valued at as much as EUR 160 billion (de Jong, 2004). Still, the sector was not resurrected, despite this potential economic value, and with the recently announced closure of coal-power electricity, the move appears prescient in retrospect. The Netherlands will avoid the issues of stranded assets and the need to transition workers at a period of economic decline for the sector, or face the need for large fossil fuel subsidies.

Engagement, and ultimately alignment between management, labour and government, was considered one of the fundamental aspects of success in this transition (Gales & Hölsgens, 2017). In the Netherlands case, the cooperation of the unions, the government and State Mines is clearly indicated.

Like Indonesia, but in a slightly different way, economic trends in the energy sector were also a key influence in the success of transition. In Indonesia, it was falling international market prices that were a driver in success. In the Netherlands it was the emergence and increasing competitiveness of natural gas as a substitute for coal driving the recognition (by all key stakeholder groups) that a need to transition coal would have to happen before the economic situation for coal worsened.

The approach for the Netherlands also outlined that there was a place for temporary, well-targeted fossil fuel subsidies, if they are part of an overall transition plan that will lead to the long-term restructuring of the sector with objectives of green economy and just transition in mind, particularly the support of workers. The Netherlands did put in place price supports for coal, but these were expressly tied to support for workers and the long-term goal to transition the sector.

Overall the transition has had significant positives, but also shows that there is no perfect approach. However, by focusing on employment, the transition at least ensured that there were opportunities for workers in a post-coal production economy.

5.0 Conclusions: Lessons and Additional Thoughts on Achieving Development Goals

This paper contains several examples of how sectors can transition, and how, at least in theory, these transitions can be conducted using methods that are simultaneously considerate of green economies and just transitions. We have also looked at how FFSR can be a simultaneous process that contributes to the objectives of green economies and just transition.

What the case studies present is a history of FFSR processes that have, to varying degrees, sought to include a focus on economic reform, employment and workers through the transition process. In some cases, an employment focus was at the forefront of the reforms (e.g., the Netherlands) while in others it was a reaction to how the FFSR process unfolded (e.g., Mexico). In some examples, these FFSR processes have also had economic arguments for FFSR at the forefront (Mexico, Indonesia, Argentina), while for another a great motivator was environmental (Morocco), and for one, worker transition was the overall goal (the Netherlands). Lastly, we have also seen varying degrees of success, with some processes running very smoothly (e.g., Indonesia), while others were much more rocky (e.g., Mexico). Despite these differences, we do identify some key lessons and consistent themes.

Some of the key takeaways of this exercise include:

- While none of the governments undertaking FFSR processes explicitly addressed just transition and the green economy as objectives, in looking at their motivations it is clear that it is an underlying theme, even if it is implicit as opposed to explicit or framed in alternative terminology. The transition in the Netherlands, for instance, adopted key themes about the protection of workers and ensuring stable transition for them 40 years before the idea of just transition gained international prominence. In other countries, such as Mexico, engaging representatives of workers proved critical to successful implementation.
- What we find in several of the countries is that restructuring of FFSR is not only beneficial to just transition, it is critical, and vice versa. For several of these countries, including Mexico, Argentina and Indonesia, subsidies to the fossil fuel industry were becoming an ever-increasing burden on the public purse, to the point that FFSR was as much a necessity as it was a desire. Without the burden of fossil fuel subsidies, some of these governments were able to avoid having to cut government services, while in others, such as Indonesia and Morocco, reform of subsidies is directly tied to investments in the social safety net and clean energy industries. Without public funds tied up in unsustainable price controls or subsidies to promote struggling sectors, spending could be done in a way that is much more consistent with the objectives and principles of just transition.
- We also find that stakeholder engagement and public communication are key to successful implementation. In Indonesia, President Joko Widodo made it a priority to communicate the necessity and benefits of reforms. In the Netherlands, (then Minister) Joop den Uyl spoke to the need for transition to focus on the benefit of workers and to bring labour and employers to the table together to plan and implement transition. In Mexico, it was only after workers' groups were engaged that some of the initial protests from workers' groups started to abate.
- We also find that FFSR is important for both consumption and production subsidies. We learn that even for consumption subsidies targeted at supporting the poor, many of the benefits are actually realized by the upper income groups in society. We also see that even where subsidies were retained in the short term to assist in keeping a sector stable while transition occurs, such as in the Netherlands, they were always intended to be in place to support worker transition, and ultimately reformed when no longer necessary to support worker transition.
- Critically, we also see that FFSR can be a key funder for the just transition. In 2015, global subsidies to both consumption and production of fossil fuels were at least USD 425 billion. At the same time, the cost of just transition will be significant. Reforming fossil fuel subsidies will contribute to the transition to green economies by removing supports for fossil fuel sectors that harm the environment; utilizing the

revenue raised from reform can go a long way to supporting the policies, programs and infrastructure that are required for just transition. Several case studies identified the ability of FFSR to help stabilize budgets in crisis (Argentina, Mexico) or create much-needed investment revenues for national priorities (Indonesia).

5.1 Linkages to NDCs and SDGs

Integrating FFSR, the green economy and just transition is a complicated exercise, but there are benefits in that all work towards the same objectives. It is also worth considering that there are natural linkages to the NDCs of the Paris Agreement and the SDGs. Some countries are already taking the step of linking FFSR to NDCs, such as Morocco, for which FFSR can deliver roughly 6 per cent of the NDC contribution on GHG mitigation (Terton et al., 2015). The link between SDGs and FFSR is also inherent in SDG 12 on sustainable consumption and production, which contains an indicator on FFSR (Inter-Agency and Expert Group on Sustainable Development Goal Indicators, 2017). Developing a comprehensive, integrated process would be complicated for any country, but should be a strong consideration to avoid duplicative and parallel processes that can be inefficient uses of precious resources. An examination of the ways to integrate all of these concepts would be an intriguing exercise given the obvious linkages, but given the complexity of the exercise in this study, it is not a small task.

What is revealed in the case studies is that the outcomes of the FFSR process have co-benefits in terms of meeting NDCs and SDGs, such as reduced GHG emissions from removal of fossil fuel subsidies, in addition to implications for just transition and green economy. Identifying and quantifying these benefits is a good starting point, even if full integration is a much more difficult task.

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