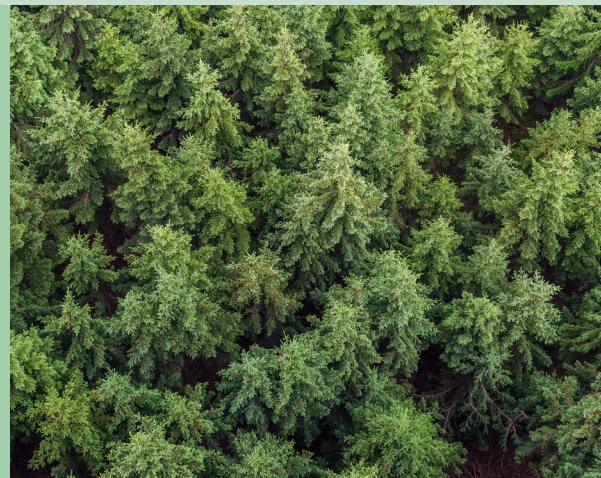
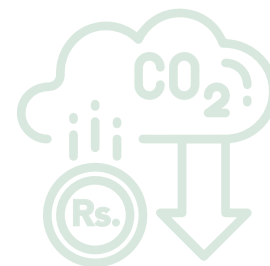




CARBON PRICING: POLICY OPTIONS FOR PAKISTAN



Carbon Pricing: Policy Options for Pakistan



Background

With the role of greenhouse gases (GHGs) and carbon emissions having been established as a primary contributor to climate change and its deleterious effects on the planet, governments around the world have been putting in place mitigation strategies.

Broadly, these strategies have targeted the main sources of GHG emissions (mainly fossil fuel use in energy and transportation), while incentivising, encouraging as well as mandating alternate sources of energy, such as renewable sources.

While Pakistan is a very low emitter of Greenhouse Gases (GHGs)/carbon, it is amongst the most vulnerable to climate change caused by global GHG emissions. According to the Long Term Climate Risk Index from GermanWatch, Pakistan ranked among the top 10 most affected countries by climate change in the world for the period 2000-2019.

CRI 2000-2009 (1999-2018)	COUNTRY	CRI SCORE	FATALITIES	FATALITIES PER 100000 INHABITANTS	LOSSES IN MILLION US\$ PPP	LOSSES PER UNIT GDP IN %	NUMBER OF EVENTS (2000-2019)
1 (1)	Puerto Rico	7.17	149.85	4.12	4149.98	3.66	24
2 (2)	Myanmar	10.00	7056.45	14.35	1512.11	0.80	57
3 (3)	Haiti	13.67	274.05	2.78	392.54	2.30	80
4 (4)	Philippines	18.17	859.35	0.93	3179.12	0.54	317
5 (14)	Mozambique	25.83	125.40	0.52	303.03	1.33	57
6 (20)	The Bahamas	27.67	5.35	1.56	426.88	3.82	13
7 (7)	Bangladesh	28.33	572.50	0.38	1860.04	0.41	185
8 (5)	Pakistan	29.00	502.45	0.30	3771.91	0.52	173
9 (8)	Thailand	29.83	137.75	0.21	7719.15	0.82	146
10 (9)	Nepal	31.33	217.15	0.82	233.06	0.39	191

Figure 1: Vulnerability to Climate Change

Source: GermanWatch

COUNTRY	EMISSIONS MT GHG	PERCENT OF GLOBAL	PER CAPITA TONNES GHG
China	13,739.8	27.8%	9.71
USA	6297.6	12.7%	19.27
India	3619.8	7.3%	2.67
Russian Fed.	2313.7	4.7%	16.07
Japan	1270.2	2.6%	9.99
Pakistan	540.6	1.0%	2.51

Figure 2: Pakistan - GHG Emissions Profile





Source: UN Environment Programme

The widespread losses faced by Pakistan by extreme weather events in 2022, ranging from severe heat waves and drought to historic flooding, has prompted renewed focus at the global level on the threat to humanity posed by climate change. It has also underlined the need for urgency in policy action by countries.

According to the World Bank's [Pakistan] Country Climate and Development Report (November 2022), "[t]he total investment needs for a comprehensive response to Pakistan's climate and development challenges between 2023 and 2030 amount to around US\$348 billion (or 10.7 percent of cumulative GDP for the same period)." In addition to the climate change challenge, Pakistan is among the most polluted countries in the world in terms of air quality/ambient air pollution, with substantial economic and health costs.

According to an estimate by the World Bank, the annual cost from air pollution incurred by Pakistan is equivalent to a loss of 6.5 per cent of GDP each year. Based on data for more recent years, air pollution is the sixth leading risk factor for mortality in Pakistan. The health costs attributable to ambient air pollution are substantial. It is estimated that air pollution shortens the average Pakistani's life expectancy by 4.3 years, relative to what it would have been if the WHO guideline on air pollution was met.¹

The range of costs associated with environmental degradation and emission of carbon plus PM2.5/NOX are both direct as well as indirect, and include:

-  **Health and social costs**, including increased medical expenditures of households as well as different levels of government + income loss due to productivity impairment, premature mortality, increased morbidity, degradation of quality of life etc.
-  **Fiscal costs** to government incurred in tackling the effects on the environment (including the cost of any subsidies, grants and loan guarantees)
-  **Economic costs** incurred by households as well as firms due to loss of income and livelihood caused by productivity loss, loss of economic assets, increased expenditures, rise in cost of doing business, any decrease in crop yields, the opportunity cost of any potential diversion of investment, migration of human capital etc.
-  **Environmental costs** such as loss of habitat, contamination of clean water sources etc.

¹ World Bank. Pakistan Country Climate and Development Report (November 2022)

Hence, in the context of climate and environment threats, Pakistan's policy challenge is two-fold:

1 To dis-incentivise carbon as well as PM2.5/NOX emissions² while incentivising the adoption of "green" technologies and "green" sources of economic growth;

2 To augment government revenue sources in an optimal and first-best manner, to mitigate the economic impact on lives and livelihoods from climate change, as well as to adopt appropriate adaptation strategies.

Policy Options

With these twin objectives in mind, what are the policy options for a developing country such as Pakistan. Broadly, there is more than approach governments can take for carbon pricing. The common aim, however, is to begin capturing the external costs of carbon emissions ("negative externalities") – costs that the wider population pays for in other ways, such as health care costs, or a rise in food insecurity from heat waves and droughts or to property from flooding and sea level rise – and tie them to the sources of carbon emissions.

A price on carbon helps shift the burden for the social and economic losses back to the emitters, and dis-incentivises excessive carbon emissions and/or incentivises investment in, and adoption of, clean technology as well as sources plus methods of production. Instead of directing who should reduce emissions, where and how, a carbon price gives an economic signal and allows polluters to decide for themselves. In this way, the overall environmental goal is achieved in the most flexible and least-cost way to society. The carbon price also stimulates investment in clean technology and market innovation, paving the way for new, low-carbon drivers of economic growth.

There are two main approaches to carbon pricing:

- **Via carbon markets such as emissions trading systems (ETS), commonly associated with cap-and-trade systems or carbon offsets; and**
- **Carbon taxes (or its sub-set, a fuel tax)**

In cap-and-trade systems, governments set a limit (or cap) on the total amount of emissions allowed within a specific jurisdiction. They then issue or auction a corresponding number of permits, known as allowances, which represent the right to emit a certain amount of carbon dioxide or greenhouse gases. Companies that exceed their allocated allowances can purchase carbon credits from other entities that have achieved emission reductions beyond their required targets.

Carbon credits are a tradable unit that represents a reduction or removal of greenhouse gas emissions from the atmosphere. They are typically generated through projects or activities that reduce emissions, such as renewable energy projects, reforestation initiatives, or energy efficiency improvements. Each carbon credit is equivalent to one metric ton of carbon dioxide (or its equivalent) that has been avoided or removed from the atmosphere.

Carbon credits are also used in carbon offset markets, where individuals or organizations voluntarily offset their own emissions by purchasing credits from projects that have achieved emissions reductions. This allows them to compensate for their own carbon footprint by supporting projects that reduce emissions elsewhere.

² Particulate Matter with a width of up to 2.5 microns. NOX refers to the harmful Nitrogen Oxides (NO and NO₂).

Carbon credits are not the only form of carbon pricing, but they are a key component within carbon pricing frameworks. They provide a mechanism for industries/companies to meet emission reduction targets or offset their own emissions by supporting projects that have generated carbon credits through emission reductions.

There are broadly two types of carbon markets: compliance and voluntary. Compliance markets are created as a result of national, regional and/or international policy or regulatory requirement. Voluntary carbon markets – national and international – refer to the issuance, buying and selling of carbon credits, on a voluntary basis.

According to UNDP, “the current supply of voluntary carbon credits comes mostly from private entities that develop carbon projects, or governments that develop programs certified by carbon standards that generate emission reductions and/or removals. Demand comes from private individuals that want to compensate for their carbon footprints, corporations with corporate sustainability targets, and other actors aiming to trade credits at a higher price to make a profit.”³







The European Union launched the world's first international ETS in 2005. China launched the world's largest ETS in 2021, estimated to cover around one-seventh of global carbon emissions from the burning of fossil-fuels. Many more national and subnational ETS are now operating or are under development, according to UNDP.

The Clean Development Mechanism (CDM), adopted under the Kyoto Protocol in 1997, is another well-known example of an international compliance market. Under the CDM, emission-reduction projects in developing countries have generated carbon credits used by industrialized countries to meet part of their emission reduction targets.

A carbon tax, on the other hand, directly sets a price on carbon by defining a tax rate on greenhouse gas emissions or – more commonly – on the carbon content of fossil fuels. A majority of the countries with a carbon tax levy it on the use of fossil fuels in energy, transportation and industrial production processes, based on the amount of carbon emitted.

It is different from an ETS in that the emission reduction outcome of a carbon tax is not pre-defined but the carbon price is.

Specific to vehicular emissions of CO₂ (which is a significant source), countries have adopted a broad range of measures which include inter alia:

-  Tax on registration/purchase of internal combustion engine car
-  Annual/periodic tax on ownership
-  Tax on tailpipe CO₂ emissions
-  Fiscal incentives for purchase of electric/hybrid cars
-  Mandating the sale of electric and hybrid cars only
-  Taxing fossil fuel via a fuel tax

According to World Bank, as of April 2022, a carbon tax had either been implemented or was under consideration in 28 national jurisdictions and 8 sub-national jurisdictions around the world. In total, these initiatives would cover 2.9 GtCO₂e, representing 5.7 per cent of global GHG emissions.

³ What are carbon markets and why are they important? [May 2022].
<https://climatepromise.undp.org/news-and-stories/what-are-carbon-markets-and-why-are-they-important>

Merits and de-merits of each option

Carbon Credits

Merits

- 1. Flexibility:** Carbon credits allow flexibility in reducing emissions, as companies can choose to buy credits instead of reducing emissions themselves, giving them more options to meet their reduction targets.
- 2. Encourages Innovation:** Carbon credits encourage innovation by incentivizing companies to develop and invest in low-carbon technologies and solutions.
- 3. Global Reach/Impact:** Carbon credits can have a global impact on reducing emissions as companies and countries can buy credits from around the world, which can lead to more efficient and cost-effective reductions in emissions.

De-merits

- 1. Complex:** Carbon credits are a complex system that requires prior institutional arrangements to execute and operationalize, technical expertise as well as market knowledge to understand and implement. They also require market depth with a fairly large number of buyers and sellers providing “liquidity” in the market for efficient price discovery. In short, a carbon credits trading system is hard to implement for developing countries with weak institutional frameworks.
- 2. Volatility:** Carbon credit prices can be volatile, making it difficult to plan and budget for carbon reduction strategies.
- 3. Subject to Fraud:** The carbon credit market is vulnerable to fraud and manipulation, which can undermine the credibility of the system and decrease its effectiveness.

Carbon Tax

Merits

- 1. Revenue source:** A carbon tax provides a stable and predictable source of revenue for the government, which can be used for funding climate change mitigation and adaptation measures.⁴
- 2. Efficiency:** This option has low deadweight costs and high ‘efficiency’ (i.e. it is targeted and has low costs of compliance as well as enforcement).
- 3. Scalability:** Another appealing feature of a carbon tax (or its variant, a fuel tax), is that it has in-built scalability. A higher level of emissions of carbon and air pollutants will automatically generate more revenue for the government in proportion.
- 4. Encourages low-carbon behaviour:** Imposing a tax on carbon emissions motivates individuals and industries to reduce their carbon footprint and adopt low carbon behavior.
- 5. Simplicity:** A carbon tax is a simple and straightforward system that can be implemented easily without complex regulations.

⁴ According to the World Bank, the introduction of a high carbon tax with full revenue recycling could theoretically generate revenue of US\$28.6 billion between 2020-2030. Source: Country Climate and Development Report, World Bank (November 2022).

De-merits

1. Regressive: A carbon tax is moderately regressive, as it is likely to disproportionately affect low-income households, who may not be able to afford the increased cost of goods and services, or whose carbon/PM2.5 emissions may be relatively less due to use of lower engine capacity vehicles such as motorcycles, for example. However, governments can offset this with full revenue recycling, using a part of the total revenue collected to support adaptation and de-carbonization efforts, while the rest could be transfers to the poorest and most vulnerable households.

2. Limited to domestic emissions: Carbon tax only applies to domestic emissions, which may create a competitive disadvantage for domestic industries compared to those in countries without carbon pricing.

3. Political economy issues: Like any tax, a carbon tax is vulnerable to political influence, as it can be easily repealed or reduced by politicians under pressure from lobbyists or special interest groups. In addition, a government may not set it an optimal level to be able to reduce emissions or affect behaviour.

Finally, in the case of Pakistan, with split tax bases as well as expenditure assignments under the constitution, a carbon tax is likely to be levied as a federal levy. However, mitigation efforts are in the domain of the provinces. Hence, the proceeds of the tax will likely need to be distributed via the NFC Award to the provinces, while the political party in power in the Centre will suffer an erosion of political capital due to the levy of the carbon tax.

📌 Conclusion

In conclusion, both carbon tax and carbon credits have their merits and de-merits, and the choice of which approach to adopt will depend on specific national or corporate circumstances. In the near term, a carbon tax, specifically in the form of a fuel tax to begin with, appears to be the most feasible policy option despite its political economy considerations.

In the medium term, a combination of both, a wider carbon tax and an emissions trading system, will be required as part of a much broader policy toolbox, to reducing emissions of carbon and other air pollutants, and addressing the challenges posed by climate change.

