



Carbon pricing: Lessons for the Middle East

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Sustainability Report

The Abdullah Bin Hamad Al-Attiyah International Foundation for
Energy & Sustainable Development





INTRODUCTION

CARBON PRICING: LESSONS FOR THE MIDDLE EAST

Attention has returned to carbon pricing as a market-based method for reducing greenhouse gas emissions. Cap-and-trade and carbon taxation are the two contrasting methods, with an increasing number of jurisdictions adopting one or other or a hybrid.

What are the advantages and disadvantages of these two methods? What are the implications for the Middle East as key markets for its exports adopt carbon pricing? And what issues should Middle Eastern countries tackle if they were to adopt a carbon pricing framework themselves?



Sustainability Report

This research paper is part of a 12-month series published by the Al-Attiyah Foundation every year. Each in-depth research paper focuses on a prevalent sustainable development topic that is of interest to the Foundation's members and partners. The 12 technical papers are distributed to members, partners and universities, as well as made available online to all Foundation members.



EXECUTIVE SUMMARY

- Carbon pricing initiatives are increasingly being adopted worldwide, but do not yet have enough coverage or high enough prices to make a major contribution to reducing greenhouse gas emissions.
- The two major options are 'cap and trade' (setting an overall limit on emissions, and allowing firms to trade compliance), and a carbon tax (a fixed charge on each tonne of emissions).
- Cap-and-trade gives certainty on emissions reductions, while a carbon tax gives certainty on price.
- Europe, China, Japan, South Korea and some US and Canadian regions are among important energy markets that have adopted some form of carbon pricing.
- The use of carbon tax/allowance revenues strongly influences the political feasibility and affects the distributional impacts of carbon pricing. Revenues can be used to reduce general taxation or debt, 'hypothecated' for environmental initiatives, or returned to residents as a 'carbon dividend'.



TWO MAIN MARKET-BASED METHODS FOR CONTROLLING GREENHOUSE GAS EMISSIONS HAVE BEEN DEVELOPED

In 1960, Ronald Coase categorised environmental pollution as a public-bad, hence, incomplete property rightsⁱ, which laid the ground for policy prescriptions. Instead of "command and control" methods, market-based approaches were seen in the 1990s as more cost-effective and likely to spur innovation. Two main mechanisms have been proposed, (1) emissions trading systems (ETS) or 'cap-and-trade', and (2) volumetric pollutant taxes (in this case, carbon taxes).

These differ from non-market approaches in which governments impose non-monetary incentives and obligations to reduce the actors' carbon dioxide emissions. While performance standards directly and efficiently address greenhouse gas emissions, they may not be cost-effective, since a direct intervention comes at a higher cost compared to other measures and, can become overly prescriptive and intrusiveⁱⁱⁱ. Other non-market approaches like subsidies on renewable energy technologies, setting consumption limits for buildings, bans on energy-intensive products and energy taxes have had positive effects but are criticised on the grounds of high costs, and have failed to achieve the goal of reducing emissionsⁱⁱⁱ.

Initially applied to sulphur dioxide emissions in the US, ETS and carbon taxes have come to

TABLE 1 ADVANTAGES AND DISADVANTAGES OF REVENUE USES OF CARBON PRICING

Revenue use	Advantages	Disadvantages
Tax reform	<ul style="list-style-type: none"> - Improves tax system efficiency and has a positive effect on economic growth 	Less visible than other options; the most vulnerable constituencies are not compensated
Climate mitigation	<ul style="list-style-type: none"> - Boost carbon price effectiveness by addressing market failure - Further emissions reduction in sectors not included in the scope of coverage - Greater public acceptance of carbon pricing policies; 	Greater administrative costs compared to other alternative options in case allocation mechanisms are not established
Broader distribution of revenues	<ul style="list-style-type: none"> - Cost-effective way to fund alternative development goals - Incentivises public support when used in areas of public concern; 	If allocation structures are not in place, it can generate high administrative costs
Measures against carbon leakage	<ul style="list-style-type: none"> - Hedging emissions increases in areas uncovered by such policies - The negative effect on business is mitigated - Can increase stakeholder support 	<p>Identifying sectors in need of compensation can be difficult</p> <p>Reducing the risk of undermining emissions reduction requires careful design</p>
Individuals, households and businesses assistance	<ul style="list-style-type: none"> - Affected sources can be compensated - Low administrative costs, if allocation mechanisms are set up 	The limitations of this revenue-use depend on the design. If delivered through existing transfer systems, it can be less visible, winning less public support
Reducing public debt	<ul style="list-style-type: none"> - Capital availability and reduced economic impact of interest payments 	<ul style="list-style-type: none"> - This revenue-use lacks visibility - Neglects short-term objectives

be applied to greenhouse gases. Though usually expressed in relation to carbon dioxide, these systems can in principle cover all greenhouse gases via equivalence of global warming potential (GWP).

An ETS creates a cap on greenhouse gas or carbon dioxide emissions from selected sources while granting them a level of flexibility to either reduce or/and trade their emissions. The cap is partitioned into emission permits, representing an allowance to emit one tonne of carbon dioxide. These allowances are either issued in periodic auctions, distributed to emitters at no cost, or a combination of both. The cap gradually decreases over time to reduce overall emissions.

Under an emission cap, complying sources have a financial incentive to make deeper

reductions/cuts as they can (i) sell emissions allowances that aren't used, (ii) decrease the number of permits they must buy and (iii) store allowances for future compliance. In principle, the lowest-cost forms of compliance will be used first, making this system economically efficient. The price of emissions permits would be expected to rise over time as low-cost abatement options are exhausted, but technical innovation may offset these rises.

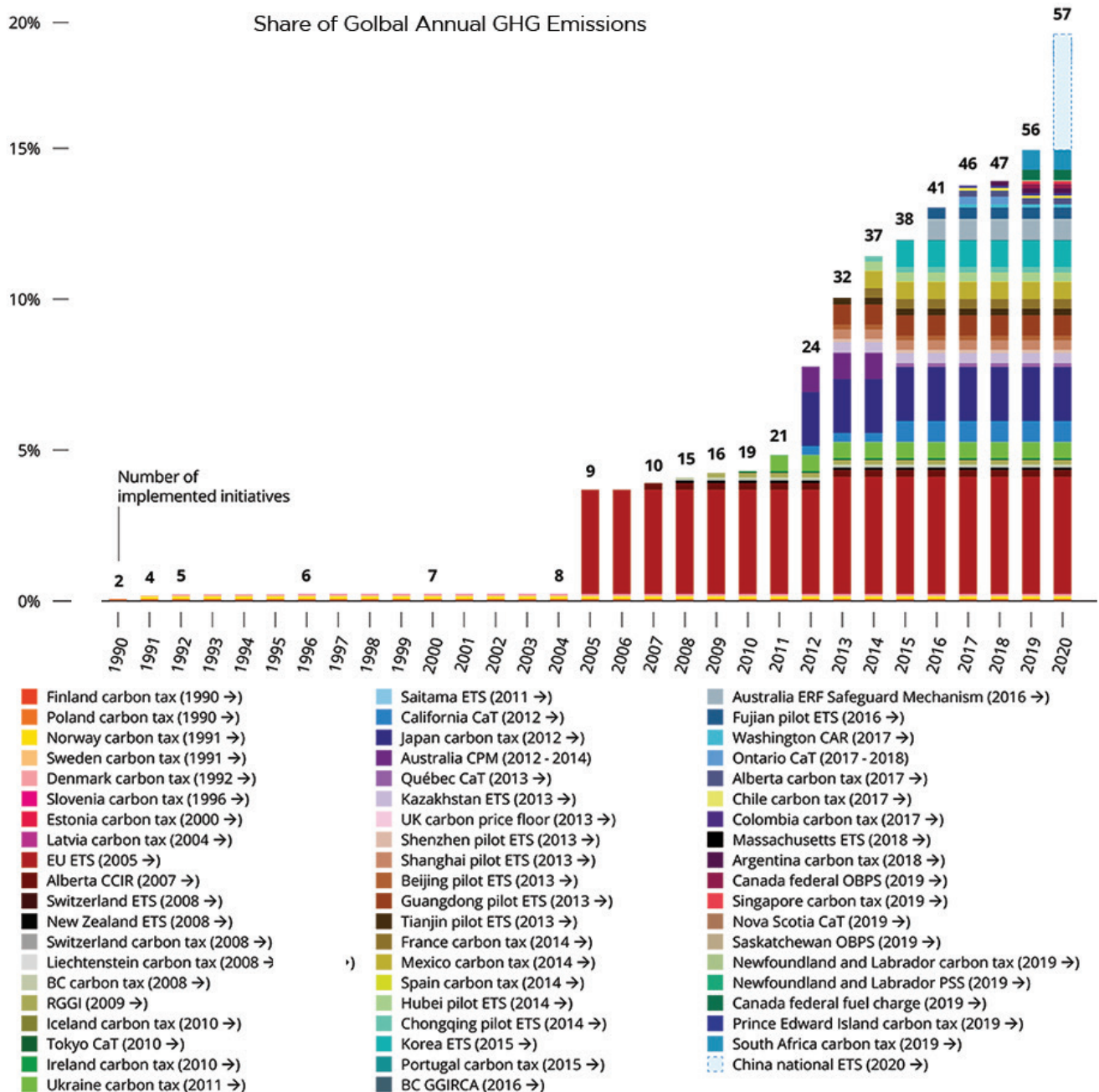
By contrast, carbon taxation attaches a price to carbon emissions per tonne, that is then paid to the government. In principle, any emitter that can abate emissions for a cost less than the tax will do so^{iv}. Carbon taxes are usually planned to start at a low level and increase over time.

TWO MARKET-BASED METHODS FOR CONTROLLING EMISSIONS

An ETS fixes the path of total emissions, which is what matters for climate change^v. However, it is hard to apply to small emitters (such as individuals) who cannot easily trade allowances. The price can be volatile, falling very low if allowances are over-allocated or the economy slows, but spiking excessively at other times. This in turn makes it hard for clean energy companies to invest.

Hybrid systems can avoid some of these drawbacks. The UK has combined the European ETS with a "carbon price floor" (set at £18 per tonne^{vi}), giving certainty of a minimum level of carbon pricing. ETSs can also have safety valves where the regulator releases extra allowances to dampen price spikes.

FIGURE 1 REGIONAL, NATIONAL AND SUBNATIONAL CARBON PRICING INITIATIVES: SHARE OF GLOBAL EMISSIONS COVERED^{vii}



CARBON TAXES AND CAPS ARE GRADUALLY BECOMING MORE POPULAR WORLDWIDE

The first carbon pricing schemes were introduced by Scandinavian countries in 1991 and the largest so far, in the EU, began in 2005. In 2018 and 2019, the number of carbon pricing initiatives increased globally, with 57 initiatives implemented or scheduled for implementation, covering a total of 11 GtCO₂e (20%) of greenhouse gas (GHG) emissions.

Carbon pricing schemes are implemented at subnational (state/province or city), national and supranational (EU) levels. These initiatives set a price between \$1-127 tCO₂ of emissions – 51% of which put a price lower than \$10 tCO₂e – raising \$44bn in revenues in 2018. However, they have so far proved insufficient to reduce GHG emissions.

The two systems of carbon pricing have been adopted in recent years in more jurisdictions such as Argentina, Singapore, South Korea, Australia, South Africa, and subnational jurisdictions in Canada (FIGURE 1).

The differences between the two pricing mechanisms mainly in terms of price certainty, emission are, political feasibility, administrative costs, tax revenue use, implementation process, and distributional impacts.



Carbon Taxes

Advantages:

- Provides more certainty about the carbon price
- Easier and quicker to implement and administer, relying on already existing administrative structures
- Minimises administrative costs
- Used on fuels for transportation, heating and cooling, carbon tax can be effective especially under revenue-neutrality (i.e. British Columbia's carbon tax)

Disadvantages:

- Provides less certainty about the amount of emissions to be reduced
- Potential tax evasion
- Discourages investment and reduces profitability
- Used on electricity, chemicals, steel and cement, carbon tax faces significant resistance from vested interests (i.e. Australian carbon tax at \$24 tCO₂ was argued by industry to have resulted in a total cost of \$9bn)
- Use of carbon tax revenue for cross-subsidising expenditures from the fiscal that are not directly related to emission reduction

CARBON TAXES AND CAPS ARE GRADUALLY BECOMING MORE POPULAR WORLDWIDE

Cap-and-Trade

Advantages:

- More certainty about the amount of emissions to be reduced
- Politically viable when applied on utility-scale power plants; used in the US, EU and China's ETS pilots

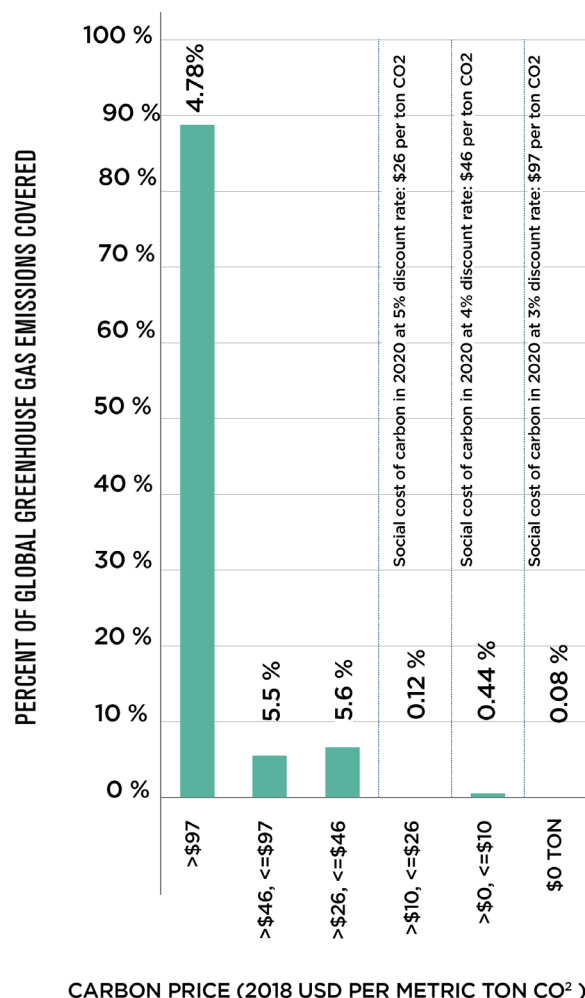
Disadvantages:

- Less certainty about the carbon price
- Cost of abatement can exceed the estimated benefits of abatement
- Takes longer to establish, requiring necessary regulations, which are more susceptible to lobbying and loopholes
- Higher administrative costs imposed on the source to establish a registry for allowance trades and keep track of changes in allowance ownership
- Hard to apply to small-scale individual emitters.

CURRENT CARBON PRICING IS FAR SHORT OF WHAT IS NEEDED TO BE EFFECTIVE IN REDUCING EMISSIONS

FIGURE 2 shows that less than 1% of global emissions are covered by a carbon pricing mechanism with a price equal to a low-end estimate of the price of carbon. This implies that the carbon pricing initiatives' coverage and price levels are insufficient, creating a carbon price gap, wherein the marginal cost of societal damages caused by carbon emissions do not adequately match the price set per tonne.

FIGURE 2 THE CARBON PRICE GAP: COMPARISON OF ESTIMATED SOCIAL COST OF CARBON^{viii}



Nevertheless, existing ETSs do provide some lessons about improving future design

China: Since the launch of its ETS in 2017, China has continued working on its carbon pricing mechanism with the recent release of the draft ETS regulation in 2019. The latter establishes the legal framework for the ETS at the national level and includes governance structure along with responsibilities of local government entities and facilities. Its national ETS and 8 regional ETS pilots are designed to cover 33% out of the country's overall GHG emissions of 12.4 GtCO₂e (i.e. 4.1 GtCO₂e), targeting industry, power, transport, aviation

and buildings sectors along with a tax on all fossil fuels. China's ETS pilots in 2018 operated at varying levels across regions due to differences in market confidence and cap stringency.

Mexico: A draft regulation to establish a pilot ETS was released by Mexico in October 2018, planned to start by 2020 and last for 2 years, with an additional year to transition to the next phase. This pilot ETS is designed to cover oil and gas, power and industrial sectors (entities exceeding 100 ktCO₂e during 2016-18 will also be covered). Measures were introduced in 2018 by the General Law on Climate Change (LGCC) and implemented in October of the same year, marking Mexico as the first "developing" country with an integrated climate change law. The draft rule for the pilot ETS was released in May 2019 for public consultation. (Non-economic penalties for non-compliance were included during the pilot phase as to incentivize actors to participate).

Argentina: A carbon tax was implemented on January 2018 on most liquid fuels, replacing previous fuel taxes, at a price of \$10 tCO₂e, designed to cover 20% of GHG emissions and raise \$300 million in revenues. This price changes according to the Consumer Price Index. As the country's currency depreciated in 2018, the carbon price was adjusted to \$6 tCO₂e since April 2019. The revenues' beneficiaries range from the National Housing Fund, the Transport Infrastructure Trust and the social security system, among others. For fuel oil, mineral coal and petroleum coke, the tax became operational since early 2019 at a 10% of the full tax rate. This percentage will increase by 10% per year, reaching 100% by 2028, the revenues of which will be distributed according to the Federal Revenue Distribution System.

(Aviation, shipping, covered fuels' exports, liquid fuels' biofuel content and fossil fuels' use in chemical processes are exempt from the tax)

South Korea: In January 2018, Korean ETS entered its 2nd phase, to take effect by 2020. Among the changes in the 2nd phase is: (1) up to 3% of the required allowances to be auctioned in certain sectors, (2) new banking regulations and (3) access to the use of international credits. Meanwhile, benchmarking will be applied more widely for allowance free-allocation and would be distributed in terms of facility efficiency. Accordingly, the waste, industry and power sectors will be added to the free allocation group of sectors through benchmarks like oil aviation, cement and oil refining. These changes serve to boost liquidity in Korea's carbon market, while strengthening the price signal to abate GHG emissions.

South Africa: After the parliament passed the Carbon Tax bill in February 2019, South Africa became the first African country to introduce a carbon pricing initiative. This encouraged solar and wind power to grow in terms of competitiveness, while utilities are being restructured. The first phase of the tax will be from June 2019 to December 2022 at a price of \$8.34 tCO₂e. An allowance of up to 10% for carbon offsets is included, which will gradually be phased down to zero. Past 2022, South Africa envisions only inflationary adjustment rates.

THE DISTRIBUTIONAL IMPACTS OF CARBON PRICING IMPLEMENTATION OF POLICY

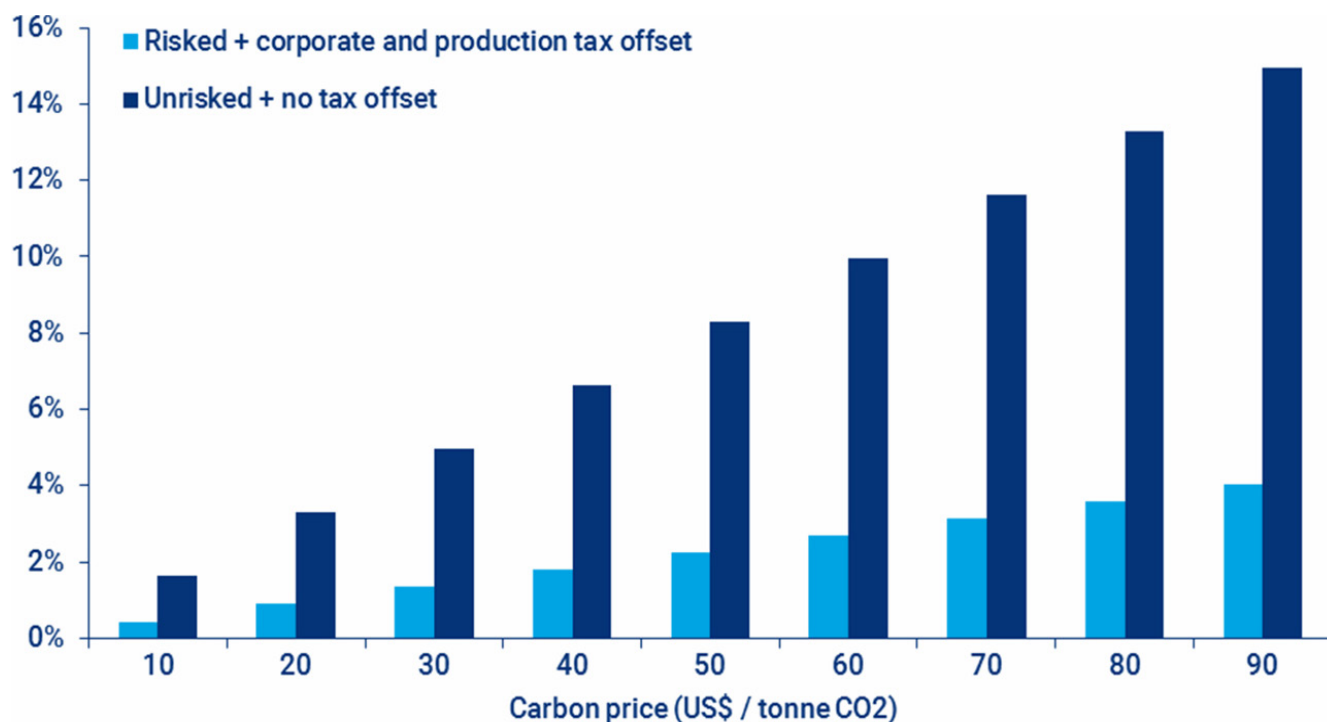
- Clever policy choices pay careful attention to the diffuse nature of costs and benefits distributed prior to carbon tax, which provides essential insights about the potential sources and level of support or opposition that a policy would receive.
- Distributional impacts of carbon policies vary across sources and are the main determinants of a carbon policy's political feasibility.
- The impact of carbon pricing on industry is strongly felt by firms characterised by high asset specificity, mainly energy intensive industries.

This impact is sometimes passed onto customers. However, price sensitivity of demand shaped by the existence of other alternatives (firms with low energy intensity) and the nature of demand for output diverts costs back to the firm subject to the carbon pricing.

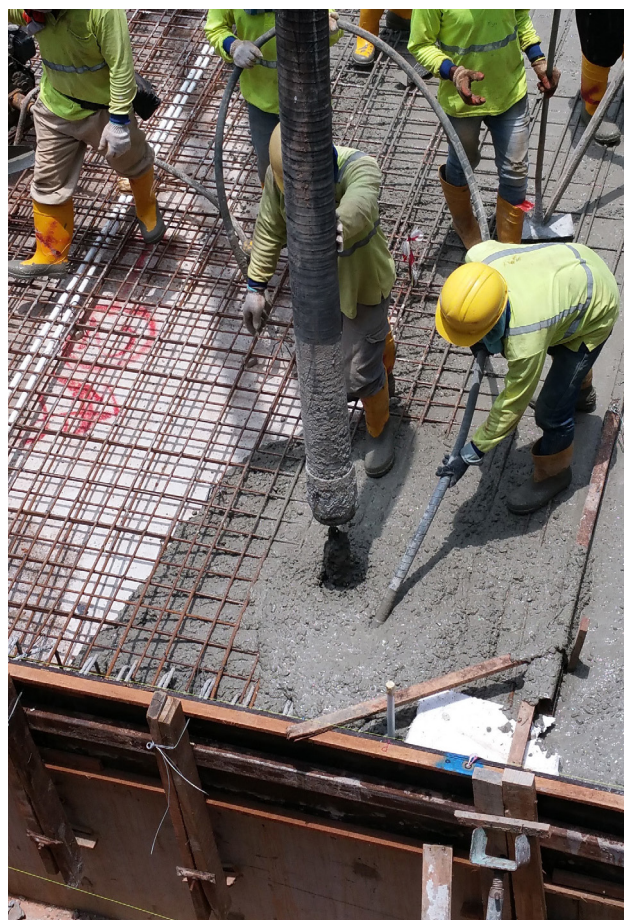
Figure 3 shows the potential financial cost associated with a carbon price on upstream operations of 25 of the biggest international oil and gas companies^x.



FIGURE 3 PERCENTAGE OF UPSTREAM 'VALUE AT RISK'



- In the context of the Middle East; oil and gas upstream operations, petrochemicals, refining, cement, metals (aluminium and steel), power, water, transport and infrastructure sectors; will be subject to substantial near-term economic losses under any carbon pricing policy.
- The impact on households varies across geography and income; households in countries that are dependent on fossil fuels for power generation are more likely to witness an increase of costs under a carbon pricing policy than other households. Wealthier households produce more emissions, as their consumption is relatively high. Poor households, however, spend a bigger proportion of their income (7%) on carbon-intensive products. For this reason, carbon pricing alone is considered a regressive policy.



During the 2nd decade of the 21st century, a plurality of international, regional, national and subnational ETSs were operating or scheduled for implementation in 36 countries. These range from EU ETS, the US's Regional Greenhouse Gas Initiative (RGGI), the AB-32 system in California, eight regional ETS pilots in China, ETSs in Kazakhstan, Switzerland, Quebec, New Zealand, South Korea and Tokyo. Most of these ETSs developed or proposed at least one linkage with another ETS scheme.

Geographic proximity constitutes the most significant predictor of ETS linkage (i.e. EU countries linked through EU ETS; north-eastern US states linked through RGGI, and Quebec and California linked through the Western Climate Initiative). This is mainly due to market information and political alignment. If nearby jurisdictions share similar environmental objectives and economic conditions, linkage would be facilitated.

The cost-effectiveness of linking ETSs is seen in the cost savings that regulated firms generated under EU ETS linked to Clean Development Mechanism (under the Kyoto Protocol). Between 2008 and 2009, €280 million was generated through the purchase of Certified Emission Reductions rather than domestic emission reductions which come at a higher cost.

Not all regulated entities benefit from linkage, since the firms' marginal abatement costs determine whether a firm is a winner or a loser. This also depends on whether the firm is in the lower or higher-cost linked ETS and whether the allowances are auctioned or freely allocated.

- Linkage proved to increase liquidity of allowance markets in small cap-and-trade systems, yet its contribution to reduce price volatility is not evidenced since in the case of small systems, price volatility increased, exposing them to systematic risk.
- Carbon leakage is effectively addressed by ETS linkage since the regulated entities in the linked systems are subject to the same carbon price.
- Linking ETSs is a way to show support for international climate action which demonstrates established mutual trust, coordinating policies and leadership. Thus, linkage builds international cooperation between different jurisdictions.

There isn't a single way to link cap-and-trade systems, but past experience shows three components that are critical for successful linkage.

- It is essential to foster a close relationship with the linking partner in advance of the link's operationalisation. Cooperation at the political level is necessary to maintain a long-term linkage.
- The greater the number of linking partners trying to align their ETS design, the harder it is to do so. For this, it is easier to achieve ETS design alignment by preparing for linkage from the beginning of ETS development.
- The type of linkage that partners choose determines how complex the linkage process can be.

This process is divided into three phases: the genesis phase, in which policy makers evaluate the possibility for linkage, the negotiation phase, in which they develop a linking agenda, and the implementation phase where covers the technical details of the linking agreement, the operationalisation, and start of the linked system.

ARTICLE 6 OF THE PARIS AGREEMENT

Article 6 of the Paris Agreement aimed to establish a global carbon pricing mechanism^{xi}, with proponents viewing it as a way to raise climate action or reduce costs. It allows for international linkage between carbon trading schemes and establishes credit trading between emissions reduction projects in different countries. The savings in mitigation costs are estimated at \$250 billion annually in 2030.

Multiple countries are hesitant to agree on Article 6, an issue which was raised in the COP25 in Madrid in December 2019, with critics suggesting it would undermine the Paris Agreement ambition. Emissions reductions could be double-counted (claimed by both the implementing and financing country), or not be truly additional (if a low-emissions approach would have been used even in the absence of a carbon price). If countries agree on Article 6 at COP26 in Glasgow in 2020, it is still not expected that major GHG emissions reduction will be achieved since a global ETS will result in low-cost allowances. Other issues, such as the validity of surplus allowances from the Kyoto Protocol, also have to be resolved.

IMPLICATIONS FOR LEADING OIL AND GAS PRODUCERS

- Implementing a carbon tax in Middle Eastern countries is challenging because of the continuing presence of energy subsidies; the effect on industrial competitiveness; and the high state ownership of industry.
- However, the EU's potential implementation of a carbon border tax on countries without a carbon pricing policy would threaten Middle Eastern exports of oil, gas and energy-intensive materials.
- If Middle Eastern countries adopted domestic carbon pricing, it would guard against such carbon border taxes, encourage the reshaping of their economies, and retain a valuable source of revenues within the country.
- The Middle East could benefit from a cap-and-trade system linked to the EU ETS. A carbon tax could be applied to sectors not covered by the ETS (primarily ground transport).
- The removal of subsidies on fossil fuel products in the Middle East is an essential step towards a carbon tax policy.
- The resulting carbon revenues would have to be carefully distributed between enabling affected firms to cope and upgrade, compensating low-income consumers, and funding more general emissions-reduction and environmental policies.

IMPLICATIONS FOR LEADING OIL AND GAS PRODUCERS

- Major oil and gas producers should negotiate at COP26 in Glasgow in 2020 to ensure a Paris Agreement Article 6 that is practical, enjoys wide support and facilitates emissions trading that would meet their needs.

WHAT IS THE MOST SUITABLE MODEL OF CARBON PRICING FOR THE MIDDLE EAST?

The Middle East, and in particular its oil-exporting countries, have several unusual features that complicate carbon pricing, or at least make it difficult to apply the lessons from other jurisdictions. These include:

- A high level of energy-intensive industries, which risk becoming uncompetitive under carbon pricing;
- A legacy of inefficient energy systems, which magnify the burden of energy price rises, particularly on low-income consumers;
- Continuing energy subsidies, which offset carbon pricing;
- A high degree of firm concentration in energy and heavy industry, most of it state-owned including usually monopoly state oil and utility companies. This means the degree of political lobbying against carbon pricing is high, domestic competitive pressure is low, while carbon taxation would mean the government effectively taxing itself;
- Low application of income and corporate taxes, preventing the use of the tax system for recycling carbon revenues or mitigating distributional impacts;

The fact that the regional energy economy is so different from that of other areas would complicate a tie-up with other ETSs such as that of the EU or RGGI. However, the Middle East also has attractive features for carbon pricing, including:

- A large quantity of low-cost abatement potential, which would reduce the overall cost of system compliance if linked to other systems such as the EU ETS;
- A relatively small number of large emitters, mostly government-owned, which can be easily assessed and tracked, assuring high compliance;
- The threat of carbon border taxes in major markets, such as the EU, creating an incentive for exporters of energy-intensive products to comply with carbon pricing in a way that retains revenues within their borders.

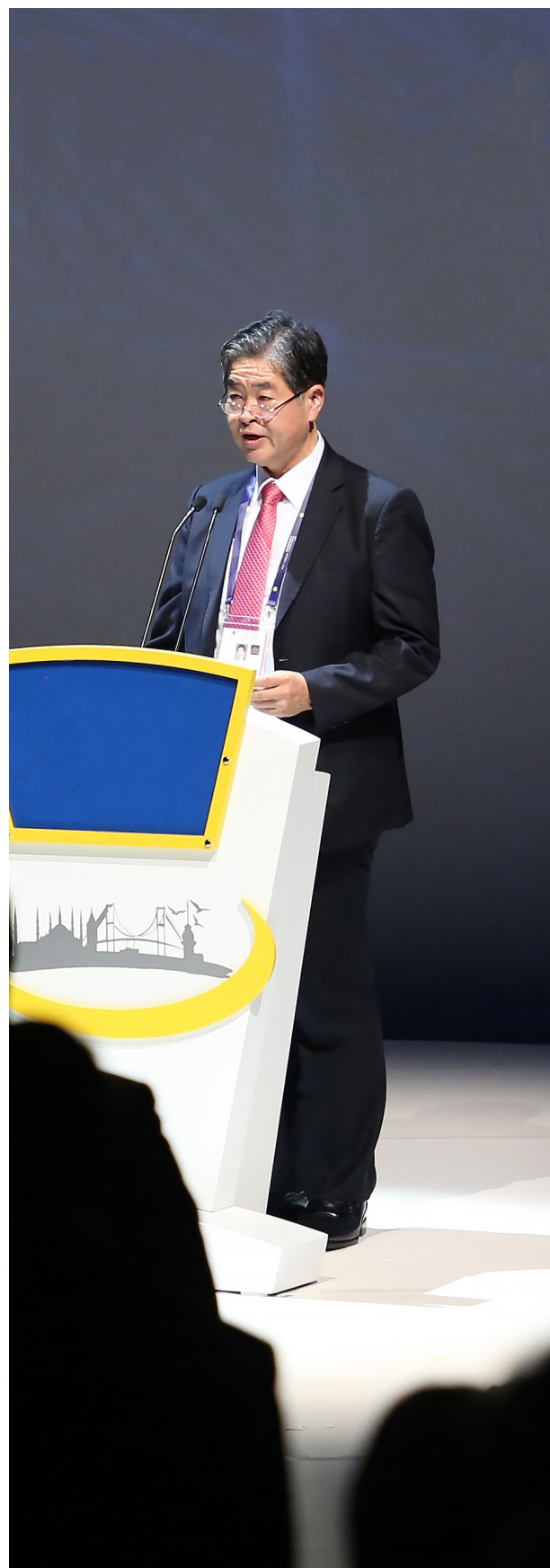
In September 2019, the World Energy Congress hosted the "Sustainable Finance and Carbon Markets: Opportunities for the GCC?" conference, where officials from the Gulf Cooperation Council (GCC) countries concluded that sustainable finance and carbon markets cannot be addressed separately but should be incorporated together to create a holistic approach to combat climate change.

Among the solutions recommended during the event was carbon pricing, which received strong agreement from the members. They suggested a cap on emissions applied to specific sectors or to the economy, with action to be prioritised in sectors with high carbon footprint, which includes the power, oil and gas sectors in the case of the GCC. The model would be most suitable if revenues, out of auctioned allowances, are invested in renewable energy and energy efficiency

projects and technologies, which the GCC is already progressing in. This was agreed on along with the removal of the fossil fuel subsidies as central to the success of these policies. This was built on the recent progress in removing the fuel subsidies for diesel and petrol, still more efforts should be directed to upstream emissions.

Another suggestion was that of a carbon tax, the revenues of which should be distributed among affected sectors or business/firms in need of assistance to achieve the energy transition. This option, however, might not be feasible as the removal of the subsidies would be enough and would play the role of a carbon tax, minus the compensation. For this reason, several approaches to remove subsidies were tested and could be applied to carbon pricing.

Oil and gas companies will need financial and technological assistance to ensure an organised transition, and even at this level, the oil and gas sectors' infrastructure legacy will persist for years to come. For this, these companies need to (1) identify new business models to ensure profitability and (2) diversify their products to include higher-value petrochemicals, although even these are dependent on hydrocarbons and vulnerable to price fluctuations. The transition from conventional technology to more efficient new technology necessitates a lot of investment, which can be generated from the cap-and-trade system's auctioned allowances. An orderly transition would also require time and revenue visibility. Also, the implementation of a cap-and-trade system along the GCC countries would prevent carbon leakage. In the event, cooperation between the GCC and EU on the implementation of carbon pricing in the region was stressed, as it could provide an incentive and push forward towards the adoption of such climate change policies.



COUNTRIES IN THE MIDDLE EAST HAVE GOOD REASONS TO ESTABLISH AN ETS SYSTEM

A regional ETS system linking GCC countries and fostering multilateral cooperation, as well as an international ETS linked to the EU ETS, can generate benefits and cost savings. This would also ensure limited carbon leakage, since it leaves no place for firm relocation, which reduces competitive effects under a carbon pricing policy.

An economy-wide carbon price proves most efficient in reducing emissions, since the marginal abatement costs are applied equally across the economy. This would incentivise companies in the Middle East to speed their transition to a low-carbon future.

Carbon trading revenues can be targeted for specific environmental projects (e.g. efficiency retrofits for industry and buildings; renewable energy installation; rebates for electric or other low-emission vehicles; expanding public transport; carbon capture and storage), and for helping energy-intensive firms to transition to lower-carbon technologies.



CONCLUSIONS

Although carbon pricing initiatives are being increasingly adopted around the world, more efforts need to be invested in order to effectively reduce emissions and achieve the Paris Agreement goals. Qatar and the other GCC countries whose economies are dependent on export of fossil fuels, have strong incentives to develop and link ETS programmes in order to avoid potential carbon border taxes on their exports to the EU. It can also help the GCC foster stronger relations with the EU at the environmental, political and economic levels.

This would be a complicated process, given the maturity of the EU ETS compared to the GCC's emissions trading concepts, and the difference in the two blocs' energy economies. Therefore, it would require detailed preparation and negotiation, and pilot schemes in limited areas that would gradually be scaled up in scope and level of cuts. The extent to which Article 6 of the Paris Agreement would facilitate co-operate efforts, should be exploited.

In this regard, GCC states should negotiate constructively at COP26, forming an appropriate coalition with supportive states, to ensure Article 6 goes into effect and is properly formulated to support a linked ETS.

APPENDIX

- i. <http://www2.econ.iastate.edu/classes/tsc220/hallam/Coase.pdf>
- ii. <https://climatepolicyinfohub.eu/node/103/pdf>
- iii. https://www.dbresearch.com/servlet/reweb2.ReWEB?rwsite=RPS_EN-PROD&rwojb=ReDisplay.Start.class&document=PROD0000000000494358
- v. <https://www.nature.com/articles/nature08019>
- vi. <https://researchbriefings.files.parliament.uk/documents/SN05927/SN05927.pdf>
- viii. <https://kleinmanenergy.upenn.edu/sites/default/files/policydigest/KCEP-Why-Carbon-Pricing-Falls-Short-Digest-singles.pdf>
- ix. <http://documents.worldbank.org/curated/en/191801559846379845/pdf/State-and-Trends-of-Carbon-Pricing-2019.pdf>
- x. <https://www.rff.org/publications/explainers/carbon-pricing-101/>
- ix. <http://documents.worldbank.org/curated/en/191801559846379845/pdf/State-and-Trends-of-Carbon-Pricing-2019.pdf>
- xi. <https://www.wri.org/blog/2019/12/article-6-paris-agreement-what-you-need-to-know>

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