Research Brief on Energy

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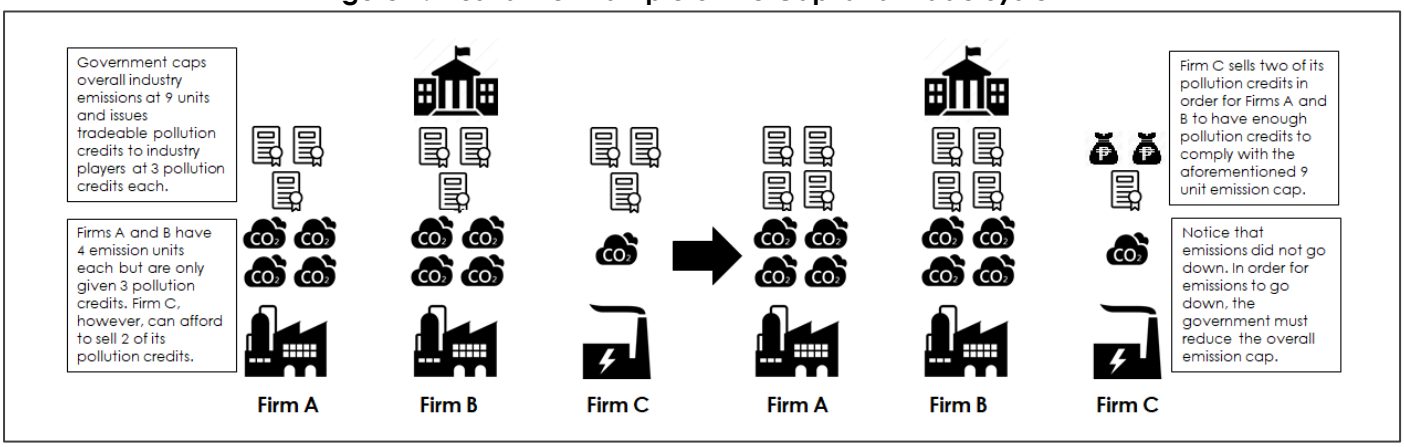
Emissions Trading

Overview of Emissions Trading Mechanisms

- **Emission trading mechanisms can be viewed as market-driven means to reduce emissions.** These mechanisms are designed to correct the perceived market failure of local and global economies to properly price emissions. The fundamental principle that drives both mechanisms is that emissions are improperly priced and thus improperly treated or in this case "traded". These solutions seek to develop the missing markets for emissions.
- **A cap-and-trade system is a market-driven emissions trading mechanism wherein the government establishes a cap on emissions on either a specific industry or the entire economy and then provides relevant industry players with tradeable pollution credits.**
- **In order to incentivize emission reductions among polluters, the cap is lowered periodically.** The lowering of the cap, in turn, makes pollution credits more valuable. This makes investments in reducing emissions appear more palatable vis-à-vis maintaining present modes of production. At some price point, purchasing pollution credits become more expensive than investing in emissions reduction improvements in industrial processes. It can thus be inferred that the emission reductions are, in fact, driven by the lowering of the cap.
- Figure 1 provides a visual overview of the cap-and-trade system.

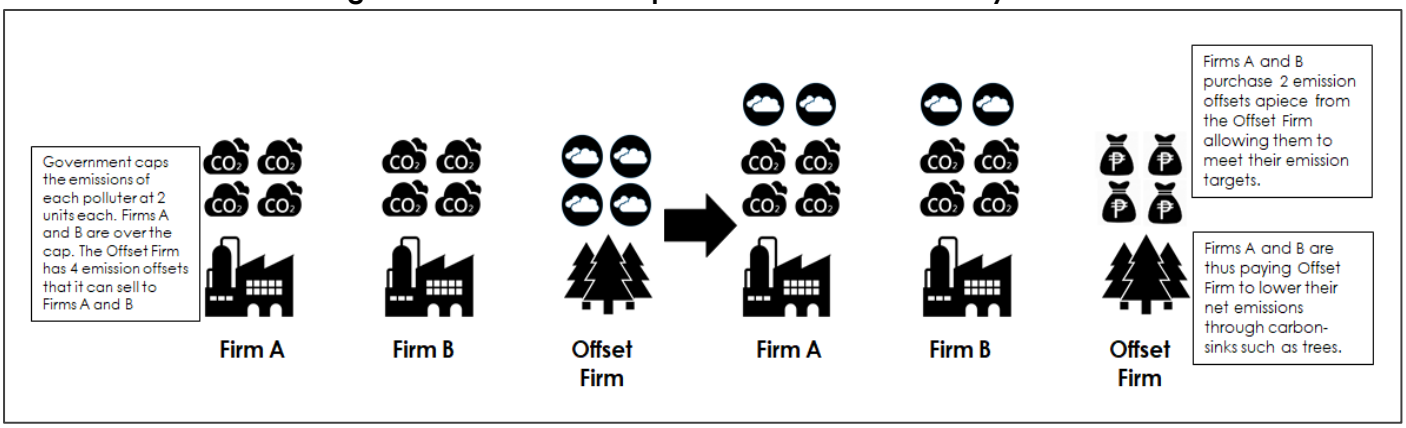
Figure 1: Illustrative Example of the Cap-and-Trade System



- **It can easily be inferred that if the cap is set too high then no emissions reduction will be elicited by the cap-and-trade mechanism.** A sufficiently low cap is needed in order to create the scarcity of pollution credits. This scarcity, in turn, would force polluters to participate in the market for pollution credits.
- **It can also be the case that the cap is set too generously and the industry does not reduce overall emission levels.** If there is a sufficient supply of pollution credits in the industry, firms with high levels of emissions could simply purchase credits from firms with low levels of emissions. This again emphasizes the importance of scarcity in the success of a cap-and-trade mechanism.
- Following the logic outlined in the preceding discussion, if the cap is lowered to a point wherein there is a sufficiently large scarcity of pollution credits, then industry players will be forced into investing in carbon reduction measures. **A sufficiently stringent emissions cap would hike the price of emissions to a point wherein it would be cheaper for a polluting firm to invest in cleaner technologies than attempt to purchase expensive and scarce pollution credits**.

- **An emission offset system is another market-driven emissions trading mechanism wherein entities can invest in emissions reduction projects and then proceed to sell the implied reductions in emissions to polluters.** These entities, in essence, produce pollution credits in order to sell these credits to polluters. For example, a company can invest in reforestation specifically to produce pollution credits or emission offsets. The planted trees are viewed to sequester a particular amount of carbon. This particular amount of carbon can then be sold to another company that wants to meet a particular pollution target.
- **A critical component of an emission offset system is a strictly enforced and sufficiently stringent emissions cap for polluting industries.** There would be no demand for emission offsets if polluters are allowed to pollute at any level that they please. The cap is what ultimately creates the market for emission offsets.
- An emission offset system can be combined readily with a cap-and-trade system.
- Figure 2 provides a visual overview of an emission offset system.

Figure 2: Illustrative Example of the Emission Offset System



- Similar to the cap-and-trade mechanism, **the success of the emission offset mechanism is hugely reliant on the strictness of the emissions cap.** An emissions cap that is too generous would allow polluters to ignore emission requirements and offset firms. Polluters would not demand for emission offsets because they would be comfortably below a generously set emissions cap.
- **The lowering of the cap tacitly increases the opportunities for offset firms.** By lowering the cap, the government is essentially increasing the demand for available offsets.
- **The offset mechanism essentially allows polluters to pay other firms to implicitly lower their net emissions.**
- **The preceding discussion describes the manner in which the cap-and-trade system and the emissions offset system (1) establish a pricing mechanism for emissions, (2) compel polluters to internalize at least part of the externalities of pollution, and, in the process, (3) develop a market for emissions trading.**
- Table 1 provides an overview of several of the salient features as well as the key differences of the two mechanisms discussed above.

Table 1: Overview of the Cap-and-Trade and Emission-Offset Mechanisms

FEATURE	CAP-AND-TRADE	EMISSION OFFSETS
Underlying Mechanism	Exists as a compliance mechanism wherein the trading occurs within a system with a finite tradeable emissions resource (e.g. tradeable emissions allowances)	On its own, it can be viewed as a baseline-and-credit system wherein credits are not finite. The amount of credits is driven by the demand. It is of note that it can be combined with a cap-and-trade mechanism as mentioned above.
Key Requirement	Requires the existence of a strict cap in order to stimulate demand for tradeable allowances.	Requires the enforcement of "additionality" to stimulate demand. Additionally means that every emissions offset project has to have been specifically induced and ultimately paid for by an emitter.
Role of Government	Periodically calibrate the cap to meet targets. Enforce the cap. Ensure that companies are, in fact, emitting within the parameters specified by their caps.	Enforce "additionality" requirement. Carefully account for the emissions vis-à-vis the emission offsets bought and paid for by a firm. Verify that emission offset projects are not double counted (i.e. carbon offsets are not sold to multiple emitters).
Examples	European Union Emissions Trading Scheme (EU), New South Wales GHG Abatement Scheme (UK), Regional GHG Initiative (US), Western Climate Initiative (US)	Clean Development Mechanism (Under Kyoto Protocol – Offset Projects in Developing Countries), Joint implementation (Offset Projects in Developed Countries), EU-ETS Linking Directive

Issues with Emissions Trading Mechanisms

- **Emissions trading mechanisms can be made to fail by powerful lobbies.** Given the primacy of caps to emissions trading mechanisms, powerful lobbies can focus all their resources on getting the cap to be as generous as possible to nullify its impact on the industry.
    - If regulatory capture is a distinct possibility, then emissions trading mechanisms would likely fail.
    - If policy consistency cannot be guaranteed (e.g. policies are subject to the ebbs and flows of the political cycle), then lobbying groups can more easily effect policy changes that would be deemed as favorable to them.
        - Lobbying groups can fund a candidate that would relax stringent caps.
        - Lobbying groups can use horse-trading to soften the stance of an administration
- Within the Philippine context, **price increases in electricity will be unavoidable if the emissions trading mechanisms above are functioning properly.** Given that (1) polluters are compelled to pay for pollution (i.e. internalizing the externality) and (2) the cost of pollution can be treated as a pass-through cost of production, then it stands to reason that the cost of pollution will ultimately be shouldered by the electricity consumers. This applies to both mechanisms discussed above.
    - A strong argument can thus be made that the successful implementation of an emissions trading mechanism will unambiguously increase prices – given the existing parameters of the Philippine energy industry (i.e. no nuclear energy, heavy reliance on coal-fired power plants, dwindling supply of domestic natural gas, EPIRA rules for producers, etc.)
- **The manner in which the pollution permits in a cap-and-trade regime can also be viewed to be an especially thorny issue.** If, for example, the number of permits awarded to each polluter is treated as a function of present levels of pollution of the polluter (alternatively called as "grandfathering") then the distribution of permits would tacitly reward those who've polluted the most in the past. This, in turn, can be viewed as regressive. On the other hand, if permits are distributed across all industry players more or less equally and regardless of the size of the operations of each player, then an argument can be made that the government has just tacitly subsidized low-pollution firms and taxed high-pollution firms – and largely ignored the operational distinctions of each firm. The possible instant windfall for the luckier firms could be viewed as unfair and market distorting. Either choice would lead to fierce debate insofar as public finance and equity would be concerned.
    - It can thus be inferred that pushing a cap-and-trade regime would be politically difficult and costly. Given the numerous ways in which equity in public finance can be presented, the setting of the cap alone would provide plenty of opportunities for opposing legislators to stonewall the prospective measure. Over time, resistance to the measure will likely build – resulting in a legislative deadlock and ultimately the demise of the bill.
    - The preceding discussion again emphasizes the potential role of lobbying groups in determining the outcomes of legislative campaigns involving emission trading systems. Lobbying groups, given their power and their reach, would likely have the capacity to nudge legislators towards opposing any cap-and-trade proposal.
- Another issue with emissions trading mechanism is the pricing of emissions. **Strictly speaking, the manner in which emissions are ultimately priced is arbitrary and would change depending on the chosen mode of measurement.** Even after settling for a specific pricing methodology, the resulting variable would be a function of a variety of variables that cover numerous areas such as health, environment, fuel prices, etc. Moreover, as a function of these inherently volatile variables, the resulting variable would be extremely volatile in itself.
    - Strict adherence to a singular formula and a single metric could prove disadvantageous to the entire industry. Improperly calibrated metrics and/or metrics that do not adequately reflect the volatility of critical variables could result in severe market distortions that the consumers will ultimately pay for. The pricing, for example, could fail to properly account for the prices of fossil fuels. As a result, fossil fuels could be saddled with additional surcharges - thereby magnifying inflationary pressure that could emanate from global fossil fuel price fluctuations.
- **Emission offsets can be viewed to ultimately allow the preservation of the fossil fuel status quo.** This is especially true in jurisdictions wherein there is no suitable replacement for fossil fuels. Given that producers that rely heavily on fossil fuels can simply pay for the right to pollute (and in the case of the Philippines, pass on these costs to consumers) and the option to maintain the status quo is present, then it would behoove them to simply continue polluting.

- **The accounting behind emission offsets can be viewed to be problematic.** Unless the firm is directly engaged in emissions capture and sequestration at the point of production, it would be difficult to

completely account for the manner in which an offset firm actually negates the emissions of a polluting firm. Put differently, how could regulators ensure that a man-made forest offsets the specific, agreed-upon amount of emissions from its client?
    - If the accounting can be viewed as imprecise, then an argument can be made that emission offsets provide a possibly inflated sense of security. If the accounting is off, then polluters could be polluting more than what is being actually negated by offsetting firms. The payments made by polluters to offsetting firms only impress upon them, the people, and the government that overall emission levels are not increasing – when it is possible that they are increasing.
- **The expansion of the market and the supply for offsetting services could result in socioeconomic development distortions.** In particular, investments in offsetting services could result in the displacement of farmers in rural communities. This, in turn, would weaken (an already weak) agricultural sector and affect economic growth and developmental trajectories.
- Table 2 overview of issues associated with cap-and-trade and emission offset mechanisms.

Table 2: Overview of the Issues with Cap-and-Trade and Emission Offset Mechanisms

<table>
<tr><th>CAP-AND-TRADE</th><th>EMISSION OFFSETS</th></tr>
<tr><td colspan="2">• The costs associated with the internalization of the externalities will be passed-on to consumers
• The pricing of emissions will be heavily debated.
• Incorporating additional layers of complexity (e.g. cap-and-trade with emission offsets) would allow firms more leeway to game the system to their advantage.
• Subject to imperfect information regarding pricing.
• Securing the scarcity of the permits/allowances/credits can prove challenging
• Requires robust administrative and regulatory mechanisms
• As market-driven mechanisms, the ultimate impacts on emissions would be accompanied by uncertainty.</td></tr>
<tr><td>• The centrality of the cap to the mechanism makes it a prime target for lobbying.
• The distribution of cap space will likely stall the passage of a cap-and-trade mechanism given the defensibility of arguments for various modalities
• In an environment where regulatory capture is likely, cap-and-trade is a risky proposition.</td><td>• The accounting for the value of emission offsets will likely prove problematic. This would require a powerful regulatory body capable of precisely measuring the emissions and the offsets of the industry. Even then, the manner in which emissions will be valued will make the job of the regulatory agency immensely difficult.
• Emission offset investments can distort developmental trajectories (e.g. “crowding out” farmers)</td></tr>
</table>

Related Issues: Taxation as an Alternative

- **The government can extract revenues from cap-and-trade and emission offset mechanisms – albeit in a circuitous or roundabout manner.**
    - For cap-and-trade mechanisms, the government can auction off the allowances and permits and gain revenues at the start of every auction cycle.
    - For emission offset mechanisms, the government can tax the revenue streams of offset companies – tacitly taxing and raising the price of offsets.
- The preceding discussion suggests that if the goal is to price emissions, then **taxation is a viable alternative if the government is particularly concerned about (1) extracting revenues and (2) avoiding the task of regulating a market for emissions.**
- **Direct taxation also affords the government greater latitude to partially offset the price increases from the emissions tax** (e.g. reduction of existing taxes, additional social services).
- Ultimately, however, **insisting on pricing emissions by applying an emissions tax will prove painful to consumers – and thus hugely unpalatable to the general public**. By pricing something that wasn’t previously priced, then the government will be forcing consumers to pay.

Related Issues: Pricing Reliability

- If the government forces fossil-fuel energy producers to internalize their externalities, then it stands to reason that the government should also force wind and solar developers to internalize their externalities. In particular wind and solar producers should also be forced to account for the intermittence of their products. Put differently, if the goal is to properly account for all associated costs of all energy products, then there should be a proper accounting of the costs of intermittence.

The EU Experience

- Literature indicates that the European Union Emissions Trading Scheme (EU-ETS) is the world's largest carbon trading scheme as well as the longest-running cap-and-trade market. It has served as the template for cap-and-trade markets in jurisdictions such as the US and Australia. **A strong argument can be made that the EU-ETS has shaped the global landscape for emissions trading.**
- European Union Allowances (EUAs) are essentially carbon permits. As such EUAs comprise the currency in the EU-ETS.
- **The distribution of the allowances was influenced by the concept of "burden sharing" or a desire for equity insofar as economic growth and development were concerned.** In particular, relatively poorer countries were allowed to increase their emissions (e.g. Portugal) while others were given stricter limits (e.g. Germany and UK).
- **The finer points that ultimately determine the caps for each country were determined through intense negotiations within the European Commission.**
- Critics of the EU-ETS have underlined several issues with the present implementation of the system.
    - **First and foremost, the existing caps appear far too generous to elicit significant shifts away from fossil fuels.** Analysts argued that the observed over-capacities were due to intense lobbying efforts from the private sectors of EU member countries. It is of note however, that the size of the over-capacities has decreased in the years that followed the initial implementation.
    - **Second, critics have observed that the market for offsets has been expanding – thereby inflating the actual cap for emissions throughout the EU.** In 2009, for example, overall EU reductions were pegged at 50 million tons. It is of note, however, that at that point there were also 80 million tons worth of offset credits within the EU-ETS-JI. This, in turn, suggests that the reduction was largely due to carbon offsets generated by projects OUTSIDE the EU.
    - **Third, the "banking" of emissions reductions is incongruent with the desire to compel industry players to reduce emissions.** If, for example, emission reductions brought about by the tanking of economies due to political upheavals could be banked and traded later on, then future "reductions" could be largely attributable to countries cashing in on (long) banked credits.
        - There is thus a decoupling of the market for emissions and the emissions reduction objective that prompted its creation.
    - **Fourth, energy producers managed to reap windfall profits upon the implementation of the EU-ETS.** This (arguably) perverse outcome was brought about by the fact that the pricing of the EUAs were priced by the industry players. Put differently, the ultimate costs of the traded carbon permits were largely determined by the industry players.
        - Firms, in particular, assumed that carbon permits would be expensive. As such, they overestimated the pass-on costs on consumers. Given that EUAs were not as expensive as they initially expected, they managed to pocket the extra revenues from the prices that they initially set for consumers.
            - An argument can be made that the firms were acting in accordance to the market parameters defined by the EU-ETS. Given that they were compelled to operate within the rules of the EU-ETS, it would have been reasonable for them to price a likely coveted commodity highly.
        - This underlines a crucial economic issue – if the EUAs were given for "free" then their valuation in the EU-ETS would be left largely to the interpretation and discretion of industry players. The permits acquire value once they are traded in the market. This flexibility, in turn, allows firms to play with their margins.
    - **Fifth, the global economic downturn resulted in an over-allocation of credits.** Prior to the global financial crisis in 2009, the EU expected economies to grow further. As such, they set their caps high on the assumption that growth would be brisk. When the recession hit, demand for electricity dropped considerably. This reduced the emissions of industries and tacitly gave industry players a surplus of credits.

Empirical Assessment of Emissions Trading Schemes in the EU and Australia

- The Energy Research Center of the Netherlands submitted a report to the European Commission summarizing its empirical findings on the impact of the EU-ETS on electricity prices. The study conducted empirical analysis on nine major EU-ETS countries (France, Germany, Italy, Poland, Spain, Sweden, the Czech Republic, the Netherlands, and the United Kingdom). The report indicated the following:
    - Power cost spreads increased considerably from 2004 (Without EU-ETS) to 2006 (With EU-ETS).
    - Increases in forward prices can be partly attributed to the pass-through of carbon costs.
    - Increases in forward prices induced by pass-through carbon costs, as expected, are much larger in jurisdictions that are heavily reliant on coal power.
    - The imposition of carbon costs induced a sharp price spike in power prices. The prices leveled off eventually but at a markedly higher price than the baseline price before the EU-ETS. The length of the leveling period is hypothesized to be a function of the capacity of the market to readjust to the new parameters (i.e. expand capacity, formulate new contracts, etc.).
    - Adjustments, however, are not guaranteed to be downward. Firms are essentially tasked to adjust their costing and pricing given the new variable (i.e. the value of carbon vis-à-vis their present and their prospective operational structures).
- Table 3 provides an overview of the estimates of the pass-through-rates in forward markets as generated by the Energy Research Center of the Netherlands. These correspond to how much of the carbon costs are ultimately passed on to customers. All presented estimates are significant at the 1% level.

Table 3: Pass-Through Rates for Forward Markets in Selected EU Markets

		PASS THROUGH RATE	
	CLASSIFICATION	**2005**	**2006**
Germany	**Peak Coal**	**0.60**	**0.57**
	Off-Peak Coal	**0.41**	**0.64**
France	**Peak Coal**	**0.66**	**0.58**
	Off-Peak Coal	**0.40**	**0.59**
Netherlands	**Peak Coal**	**1.34**	**1.10**
	Off-Peak Coal	**0.40**	**0.38**
Sweden	**Base Coal**	**0.53**	**0.62**
UK - Summer	**Peak Coal**	**0.83**	**0.58**
	Off-Peak Coal	**1.03**	**0.60**
UK - Winter	**Peak Coal**	**1.18**	**0.59**
	Off-Peak Coal	**1.82**	**0.66**

Source: Energy Research Center of the Netherlands

- Table 4 provides an overview of the estimates of the pass-through-rates in spot markets as generated by the Energy Research Center of the Netherlands. All estimates are significant at the 10% level except for the Netherlands off-peak coal estimate. It is of note that the spot market estimates exhibit considerably more volatility than the forward market estimates – given the nature of spot markets.

Table 4: Table 3: Pass-Through Rates for Spot Markets in Selected EU Markets

		PASS THROUGH RATE	
	CLASSIFICATION	**2005**	**2006**
Germany	**Peak Coal**	**1.76**	**0.92**
	Off-Peak Coal	**0.82**	**0.68**
France	**Peak Coal**	**1.96**	**1.18**
	Off-Peak Coal	**0.98**	**0.76**
Netherlands	**Peak Coal**	**4.17**	**0.69**
	Off-Peak Coal	**0.19**	**1.21**
Sweden	**Base Coal**	**0.48**	**0.44**
	Off-Peak Coal	**0.35**	**0.82**
UK	**Peak Coal**	**3.70**	**0.89**
	Off-Peak Coal	**0.70**	**1.53**

Source: Energy Research Center of the Netherlands

- **It is of note that the impact of these price increases on overall electricity retail prices were tempered by the diversity of the EU energy portfolio – as well as the capacity of EU countries to trade electricity across**

borders. This is an important consideration for a country such as the Philippines given that it is an isolated energy market with a markedly more homogeneous energy mix.

- The Energy Research Center of the Netherlands also designed a model to simulate the impact of emissions trading upon accounting for various configurations of firm-level strategic behavior.
- The following are several of the key findings gleaned from the statistical modelling results:
    - The results indicate that emissions trading unambiguously raise prices across all scenarios considered. **The estimated price increase in wholesale prices is around 10% to 30%.**
    - **Estimates for pass-through-rates range from 70% to 90%.** The volatility is attributed to country-to-country differences in market structure and demand elasticity. The pass-through-rate is typically lower in scenarios wherein demand elasticity is higher (more elastic or more responsive).
    - **The emissions trading regime is argued to have the capacity to reduce emissions by making high-carbon electricity costlier – provided that the market is PERFECTLY functioning** (i.e. demand responds rapidly to changes in price, alternative supply expands rapidly, no market failures exist). Stickiness of demand or of supply will cause complications.
    - **Operational profits of power generators in the EU are much larger in scenarios with emissions trading. Full auctioning is hypothesized to have the capacity to reduce operational profits – at least those that emanate from free allocations or grandfathering** (as was done in the implementation of the EU-ETS)
    - **Full auctioning, however, will not eliminate windfall profits from ETS-induced pass-through costs.**
- **A 2013 Yale study provides similar results specifically for Spain. According to the empirical estimates in the study, approximately 80% of emissions costs is passed through to electricity prices.**
    - The study hypothesizes that the "incomplete" pass through is partly attributable to demand elasticity and market power.
    - The results emphasize that pass-through costs are reduced by higher demand responsiveness into the model. Conversely, lower demand responsiveness would increase the pass through cost.
    - The results also indicate that relatively homogeneous industries would also have higher pass through costs. Their homogeneity coupled with stickiness would further increase the size of the pass-through costs.
- **A study published in Environment Economics and Policy Studies indicates that carbon costs in Australia were fully passed on to customers.** Additionally, they found evidence that the higher electricity prices resulted in windfall profits for generators. The study also indicated that electricity price increases in many jurisdictions in Australia (New South Wales, Queensland, Tasmania, Victoria, and South Australia) actually exceeded the actual carbon costs. Table 5 summarizes the results of the aforementioned study.

Table 5: Carbon Pass Through Rates in Australian Jurisdictions

	Estimated Carbon Pass Through Rate	Level of Significance
New South Wales	**1.01**	**a=1%**
Queensland	**1.32**	**a=5%**
South Australia	**1.17**	**a=5%**
Tasmania	**1.20**	**a=10%**
Victoria	**1.09**	**a=5%**

Source: Nazifi 2014, Environment Economics and Policy Studies

- Complementary literature suggests that large firms in markets that are not perfectly competitive can and will make use of grandfathered emissions rates to generate windfall profits. The potential for generating windfall profits from grandfathered emissions is magnified by the size of the firms relative to the industry. In an industry dominated by a few large firms, the potential is immense. Literature cites that firms in Australia and many jurisdictions in the EU have reaped windfall profits in the wake of the implementation of emissions trading systems.

Recommendations

- **The preceding discussion suggests that an emissions trading system akin to the EU-ETS would likely be an unpalatable reform agenda in the Philippines.** An emissions trading system will unambiguously raise energy prices (both for electricity and motorized vehicles). This affords would-be opponents of the measure popular support.
- **Intense lobbying from the private sector could delay or outright stonewall the proposed measure.** Alternatively lobbying pressure could result in the watering down of the emissions trading system.
- **The preceding two points suggest that not only will the proposed measure be opposed by the general public; it will also be opposed by lobbyists from the energy sector.** Put differently, legislators seeking reelection would could oppose it for both popular support and/or support from the energy lobby.
- **Alternatively, lobbyists from the energy sector MAY support the measure but only to advance their pecuniary interests.** As observed in the EU, a prototypical emissions trading system would afford industry players a great degree of latitude insofar as dictating the pricing of emissions.
- **The EU experience suggests that even if an emissions trading system bill manages to hurdle both houses of the Philippine congress it would likely result in unintended and largely undesirable consequences – such as affording energy players windfall profits.**
    - The unpopularity of the measure will be magnified immensely if or when reports emerge detailing the manner in which the bigger players managed to reap windfall profits from the emissions trading scheme.
    - The dominance of the electricity sector by a few large companies further suggests that the "gaming" of the prospective emissions trading system will be an eventuality.
- **Taxing emissions directly sidesteps the issues that could emanate from the emergence of a market for emissions trading.** It is important to emphasize, however, that taxing emissions will be unpopular given that it will increase the prices of energy products.
- Table 3 provides an overview of the aforementioned problem areas

Table 3: Overview of Social, Political, and Economic Problems of Pushing for an Emissions Trading Market

POLITICALLY UNPALATABLE	WIDESPREAD OPPOSITION	COOPTING BY BIG PLAYERS
• Emissions trading will make electricity more expensive and would thus be an unpopular advocacy. • Adopting this as an advocacy would be in opposition to present positioning (e.g. against coal tax, cheap electricity). • Opposing emissions trading will be easy for many politicians given its upfront cost implications	• Most of the general public would be against emissions trading given that it will increase cost. • Most people are likely disinterested in the idea for paying for cleaner energy. • The fossil fuel lobby could support popular opposition to the measure or work towards incorporating backdoors and loopholes in the mechanism	• The formulation of an emissions trading market will be tricky. The EU experience has demonstrated that there is a high likelihood of the decoupling of the emissions reduction goal with the development of the market. • The emissions trading market can be used by big industry players to increase their overall profit margins. This is especially true in situations wherein the energy supply is homogeneous and in the control of a few large firms.

- **If an emissions trading agenda is to be pursued, an auction for the initial carbon rights is advisable. An auction eliminates the profit opportunity from grandfathering.** Auctions also have the means to elicit price discovery among market stakeholders.
- Auctions, however, remain an imperfect solution given existing market imperfections**. If the industry is dominated by a few large firms, the resulting price of carbon via the auction mechanism will be heavily influenced by the larger firms.**
- Auctions also do not address the price increase issue**. It is important to note that an emissions trading mechanism will unambiguously raise prices in a deregulated regime simply because it ascribes a price to a previously unvalued commodity (carbon).** An emissions trading mechanism is a commitment to paying more for electricity to account for the presently unvalued costs of pollution.