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# Key factors shaping corporate climate change strategies: A study in Pakistan and the UK

Harish Kumar Jeswani[1], Walter Wehrmeyer[2] and Yacob Mulugetta[3]

[1]Centre for Environmental Strategy, University of Surrey, Guildford, GU2 7XH, UK.
Phone: +44 1483 689559; Fax: +44 1483 686671; e-mail: h.jeswani@surrey.ac.uk
[2]Centre for Environmental Strategy, University of Surrey, UK. e-mail: w.wehrmeyer@surrey.ac.uk
[3]Centre for Environmental Strategy, University of Surrey, UK. e-mail: y.mulugetta@surrey.ac.uk

## ABSTRACT

International climate policies heavily rely on market-based mechanisms, such as emission trading scheme (ETS), joint implementation (JI) and clean development mechanisms (CDM) for greenhouse gases abatement from diverse business sectors. The success of these policies depends on national policies, economic, social, and technological related factors and significantly affects how business respond to this international challenge. However, the strength and content of these factors between industrialised and developing countries, where corporate environmentalism is a relatively new phenomenon, is not the same.

This paper, therefore, reviews the role of such factors supporting greater adoption of climate change abatement strategies in developing and industrialised countries. This is based on qualitative data collected from industries, NGOs, regulatory bodies and other governmental organisations in Pakistan and the UK. The findings suggest that in the absence of regulatory and societal pressure, the only incentive for organisations is cost-savings through energy efficiency projects. However, lack of awareness, non-availability of technology, and high capital cost of the energy-efficient equipment makes this a rather thorny route for Pakistani companies. While in the UK, climate policies concerning industries for instance, EU ETS, do not provide enough incentive to companies to change from 'business as usual' because of its short-term outlook, uncertainty, complexity and the generous allocation of allowances, hence very low carbon price.

**Keywords**

business strategy, drivers, barriers, policies, energy efficiency

## INTRODUCTION

Two recent reports, the IPCC 4th Assessment Report (2007) and the Stern Report on the economics of climate change (2006) emphasised the need for early action to avoid serious impacts on world output, human life and the environment. Governments around the world are establishing programmes to meet their international commitments, which they made under the Kyoto Protocol. These programmes provide both economic opportunities as well as costs to business. In response to that challenge many industries have started to prepare for a carbon-constrained future. However, the response of companies ranges from ignoring to proactive, depending on various drivers and barriers, which vary between countries and across industrial sectors (Jeswani *et al.*, 2007; Kolk and Pinkse, 2005).

Although research on factors influencing corporate response to climate change has been limited so far, influence of factors on business responses to other environmental issues has been widely examined. With a diversity of external and internal factors cited, moreover, the literature on environmental management has examined empirically the influence of external and internal factors, but predominantly in industrialised countries. However, these factors will surely differ in developing countries, because of the very different political, economic, societal and technological context.

Thus the objective of this paper is to evaluate factors influencing corporate adoption and implementation of greenhouse gas (GHG) reduction and energy-efficiency strategies in two country contexts i.e. developing country (Pakistan) and industrialised country (UK). This will highlight the differences between (one) developing and (one) industrialised country as well as shedding light on the context of industrial climate change practice in the former. The qualitative data was analysed using the PEST framework (Political/Legal, Economical, Social and Technological).

The following section provides background on development in climate change policies affecting industries, followed by the methodology. Then the results are presented, specifically the political/legal, economical, social and technological factors affecting corporate strategies in Pakistan and the UK, followed by the main conclusions of the paper.

## BACKGROUND

The Kyoto Protocol, which came into force in 2005, sets binding emission reduction targets for participating industrialised countries recognizing the differences between industrialised and developing countries regarding their contribution of GHGs; technological capabilities; and availability of resources for implementing mitigation measures and adoption strategies, based on the principle of *common but differentiated responsibilities*.

The three flexible mechanisms known as 'Kyoto mechanisms', (i) Joint Implementation (JI), (ii) Emissions Trading (ET) and (iii) Clean Development Mechanisms (CDM) provide industrialised countries with considerable flexibility and system to engage and support the developing countries, to meet their GHG commitments (Jackson *et al*., 2001). In theory, CDM and JI promise technological and financial support for developing and economies in transition (EIT) countries, respectively, through investments in GHG abatement projects from industrialised countries. In turn this is designed to assist developing countries in achieving sustainable development while industrialised countries will achieve the compliance with their specific commitments.

In practice, the driver behind those projects is overwhelmingly low cost reduction of GHG emission rather than technology transfer and sustainable development (Ellis *et al*., 2007). Although the spread of registered CDM project have increased in last two years, still they are mainly concentrated in a few countries, e.g. China, Brazil, India, South Korea and Mexico (Silayan, 2005; Ellis *et al*., 2007).

The ET under Kyoto protocol will start in the Kyoto compliance period (2008-2012) however, at a regional level, to meet the Kyoto commitments, the European Union GHG Emission Trading Scheme (EU ETS) became effective from 2005. This sets emission limits on specific industrial activities, initially focusing on utilities and big industrial emitters in the EU. The scheme was designed to promote investment in low-carbon technologies by putting a price on carbon. However, due to the generous allocations of emission allowances to industries in first two years have led to a price slump of carbon credits traded under EU ETS (ENDS, 2006), thus rendering the initially desired emission reductions highly unlikely.

## RESEARCH METHODOLOGY

For this research, 24 semi-structured interviews were conducted with representatives of industries, NGOs and regulatory bodies in Pakistan and the UK. It is difficult to ascertain whether 24 is "enough", as there cannot be an upper limit to the number of interviews generally, but in pursuing diverse perspectives, the data collection justifiably ceased when additional data added only marginal value and repetition was common. In addition, related reports of these organisations were reviewed.

Interviews in industries were conducted with managers responsible for the organisations' environmental and/or climate change activities. The distribution of the participant companies for both countries combined shows that there is a fair representation of companies by sector, size, ownership and their climate change strategies. The companies were selected from five sectors namely cement, chemical, energy, oil & gas and textile for interviews. Half of the interviews were conducted with large companies. The ownership distribution shows that the 60% were MNC and 40 % were locally owned. However, Pakistani interviews are biased towards medium size firms and UK interviews are biased towards large companies. Equally, the majority of Pakistani interviews were with locally owned firms, whereas all of the UK participants were MNCs. The possible reasons for the above biases are that interviews were conducted with the companies that had previously participated in the questionnaire survey (see Jeswani *et al*., 2007) and accepted to take part in the interview. Therefore the findings reported here are limited to those types of organisations.

In case of NGOs, regulatory bodies and other organisations, at least one organisation in each country were interviewed. In both countries, interviews in these organisations were conducted with the persons who closely work with industries on environmental and climate change related issues. To maintain anonymity, the names of the organisations and persons are not revealed here.

For organising the collected data by themes, issues, concepts, propositions, etc., the recorded interviews were transcribed and then analysed using QSR NVivo7. The software supported in coding the data and identifying themes and patterns from the data. The repetitive desk analysis of the qualitative data generated the patterns, themes and ideas in this research project, which were later on used for coding the data.

## DATA ANALYSIS AND DISCUSSION

In analysing business strategy, factors external to the organisation are often referred to as the *macro-environment* (Johnson and Scholes, 2002). An exhaustive list of these can be categorised into four main types: political, economic, social and technological forces also known as PEST framework (Fahey, 1986). Figure 1 presents the key identified external factors which influence corporate strategies in Pakistan and the UK. These factors are interlinked with each others. By understanding the implication of the factors identified through PEST analysis, it is then possible to identify a number of 'drivers of change' (Johnson and Scholes, 2002) in the context of this research on climate change.

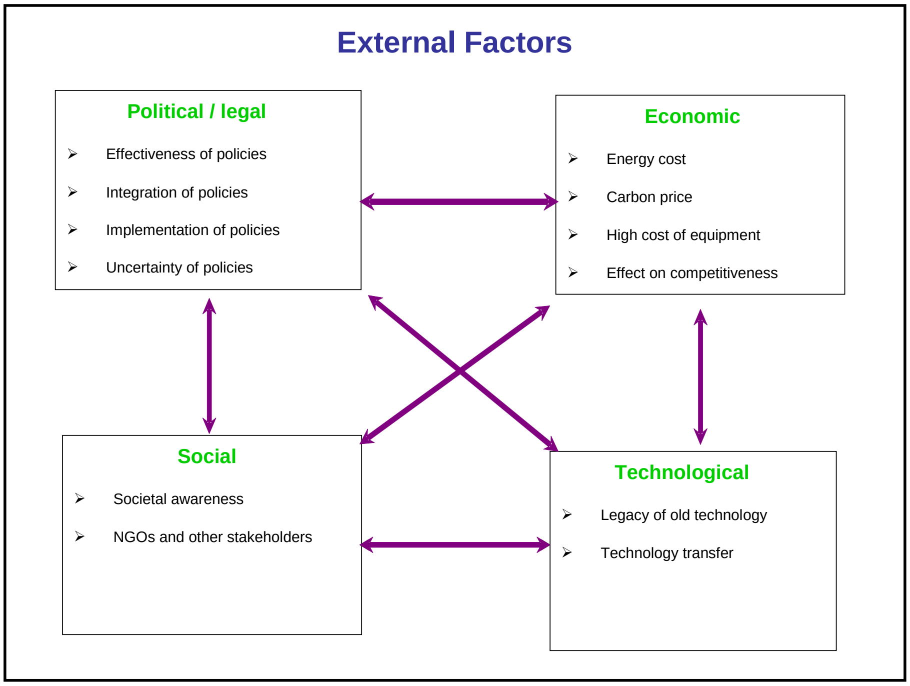


**Figure 1: Analysis of External Factors**

## Political / Legal Factors

The analysis shows that the political factors affecting corporate strategies in Pakistan are related to: a) the effectiveness of climate change policies; b) their integration with other policies; and c) the processes and pathways of policy implementation. In addition, the issue of uncertainty concerning climate change policies and regulations emerged as an important factor only for the UK. They are discussed below.

### *a) Climate Change Policies And Their Effectiveness:*

Pakistani participants were either unaware about government policies on energy efficiency and climate change or viewed them as ineffective. This position is summarised by two industry participants who argued that:
*"In this country long-term policy have not yet established & implemented and every one bluntly violates & abuses the environment"* and
*"the national policies on energy-efficiency are vague. These policies should be more specific, related to the concerned issues and result-oriented."*

Moreover, the interviews with industries revealed that many were hearing for the first time about the CDM. This is probably because the awareness and capacity building programmes regarding CDM have not been started yet. This also explains why Pakistan lags behind on CDM projects in comparison to neighbouring countries India and China[1].

The analysis also showed a need to develop clear and effective policies on energy-efficiency and climate change in Pakistan. The Government of Pakistan approved the

[1] Pakistan has so far registered only one CDM project. This project is for the abatement of $N_2O$ from a fertiliser plant. India and China have registered 250 and 90 CDM projects, respectively.

'National Operational Strategy' for the CDM in 2006, one year after signing the Kyoto Protocol. Being prepared in a relatively short time, it lacks technical depth and provides mainly administrative details. The interviews revealed that so far no study has assessed the potential opportunities for CDM projects in the country. In the absence of that knowledge, the task of preparing effective policies becomes difficult if not impossible and without effective national policy, it is highly unlikely that Pakistan will effectively participate in the international efforts and benefit from the Kyoto Protocol.

In the UK, several interviewees appreciated the role played by the UK Government in promoting climate change internationally. However, industries as well as other organisations were critical of the national policy and governmental actions. The concerns were raised over little achievements in reducing GHG at home since 1997 (i.e. after signing the Kyoto protocol). Although the UK is on course to meet its Kyoto target, it is well short of achieving its national target of 20% $CO_2$ reduction by 2010. Table 1 shows that though the government has initiated several measures under the Climate change programme (CCP) 2000 to achieve the reduction targets, the $CO_2$ emissions have actually increased between 2000 and 2005. It suggests that even though climate change has been high on the political agenda for past ten years, the complimentary policies for low-carbon economy are lacking.

**Table 1: UK Climate Policies and $CO_2$ emissions**

| Sector | Policies / measures | Actual emissions in 2000 (Mt $CO_2$) | Actual emissions in 2005 (Mt $CO_2$) | Achieved by 2005 |
|---|---|---|---|---|
| Road transport | ➢ Voluntary agreement<br>➢ Fuel duty escalator | 116.0 | 119.9 | 3% increase |
| Energy industries | ➢ Renewable Obligation<br>➢ Support for combined heat and power | 191.1 | 208.4 | 9% increase |
| Other industries | ➢ CCL<br>➢ CCA<br>➢ UK ETS<br>➢ Carbon Trust support<br>➢ Building regulations | 108.6 | 98.5 | 9% reduction |
| Residential | ➢ Energy efficiency commitment<br>➢ Building regulations<br>➢ Fuel poverty agreement | 85.8 | 83.3 | 4% reduction |
| Other | ➢ Building regulations<br>➢ Carbon Trust support | 47.8 | 46.1 | 3% reduction |
| International aviation and shipping | ➢ No measures | not quantified | not quantified | |
| **Total** | | **549.3** | **556.2** | **1.3% increase** |

Data source: (DEFRA, 2007)

### *b) Integration With Other Policies:*

Many of the participants in Pakistan were of the view of that there is a need for a long-term environmental policy, which is well integrated with other policies, especially import policies. For instance: "*in the absence of specific environmental criteria for the import, a lot of used machinery,* *as well as buses, trucks and heavy vehicles are imported which, neither comply with international emission standards (such as Euro 2 or Euro 3 standards*[2]*) nor with the National Environmental Quality Standards (NEQS).*" The import of 'old' technology, used machinery and inefficient equipment has already left a legacy of highly energy inefficient industrial plants and in the absence of environmental criteria into import policies, the import of "dirty" and inefficient technology will continue.

This will not only hinder technology transfer – one of the main objectives of Kyoto Protocol – but has further two consequences: Firstly, it will increase the energy consumption per unit of production, which in turn will increase the country's dependence on (imported) fuel as well as affect the competitiveness of industry, especially in energy-intensive sectors. Secondly, it will limit country's options to take future targets for GHG emission, which might be required in next phases of Kyoto protocol or similar international agreements. Also in the absence of (any) criteria on sulphur content in the imported crude oil and diesel, high sulphur fuel is imported which exacerbates the impact on air quality.

Similar issues of integration of policies surfaced in the UK, especially with respect to national energy and climate change policies. Referring to a recent Energy Review, one UK participant (NGO) stated, "*instead of focussing on renewable and cleaner energy sources, the government is kind of perpetrating a myth that nuclear can build the energy gap.*" The 2006 DTI (Department for Trade and Industry) review of government's energy policy aimed to address two major challenges: a) $CO_2$ emission reduction and b) secure supply of energy (Department of Trade and Industry, 2006). It was felt by some of the participants that the government energy policies are being only influenced by energy security rather than the climate change agenda and within this favouring nuclear over renewable.

Furthermore, some sectors in the UK show disapproval for overregulation and the complexity of policies. One participant from the cement sector stated difficulties encountered in increasing the use of alternate fuels in their kilns, "*In the UK we have to work to 'substitute fuels protocol' (SFP) with the regulators, this includes a lot of and extreme amount of prior consultation and testing. It can cost us a million pounds to test a new fuel. This means two things: one is to have the certainty of that investment; and the other one is that we need to make arrangement to ensure that there are sufficient quantities for these alternate fuels available. Otherwise the high investment in the trial is not worthwhile.*

This could be a reason for the current lower usage level of alternative fuel in cement industry in UK which is less than 10%, much lower than other European countries, such as Netherlands (> 80%) or Switzerland, Austria, Belgium, France, Germany and Norway with more than 30% (Pocklington and Leese, 2005). The cement industry saw the SFP as a large barrier for low use of alternate fuel as they find this process time consuming as well as costly. One participant termed UK legislations as '*much stricter than the legislation in the continent*' resulting in unfavourable conditions for investment here to build new plants. "*As cement companies are international companies. Due to these unfavourable conditions, industries might prefer to import cement from their plants in other countries in Europe, then to invest here*."

### c) *Implementation Of Policies And Enforcement Of Regulations:*

A participant from MNC in Pakistan, which is actively engaged in climate change related activities stated, "*even in the presence of the strong corporate / management commitment, the*

[2] The European standards for acceptable limits for exhaust emissions of new vehicles are typically referred to as Euro 1 (enforced in 1992), Euro 2 (1995), Euro 3 (1999), Euro 4 (2005) and Euro 5 (2009), which are series of increasingly stringent standards.

*absence of national regulatory requirements presents more hurdles for justification of GHG reduction projects."*

In Pakistan, environmental regulations for industry are mainly related to certain wastewater and air emissions. There are neither mandatory requirements for energy efficiency and GHG emissions nor energy-efficiency standards for industries. As a result, industries operate below certain efficiency resulting in wastage of resources and higher air emissions. For compliance-oriented organisations, the absence of laws causes difficulties. These standards exist in other countries, for example; neighbouring country India has enacted the Energy Conservation Act in 2001. This Act requires large energy consumers in India to adhere to energy consumption standards; new buildings to follow the Energy Conservation Building Code; and appliances to meet energy performance standards and to display energy consumption labels.

Even though environmental regulations in Pakistan are limited, the lack of efforts from industry as well regulatory bodies in implementing those is evident. Yet, regulatory agencies point the finger at industries. Many industries are fully aware of the fact that they would not be penalised for not complying with national regulatory requirements, hence they tend to disregard those obligations. Furthermore, due to the financial and technical barriers, many organisations are unable to take the required actions; even if they wanted to. However, the interviews showed a number of examples of different activities undertaken by both local and MNCs to reduce energy consumption, mainly for cost savings and while oddly, many are unaware of linking them with the CDM.

Despite this picture of limited laws that are poorly implemented and enforced, some industries give high regard to local laws. Here, their main motive is ethical - being a good corporation, so that they at least comply with the existing national laws out of a sense of duty. However, the common perception among most industries is summarised by one industry participant in Pakistan: "*Due to lack of enforcement, owners / top management do not see any benefit in making investment for environmental projects and being proactive. If one or two industries out of 10 take actions and reduce their impacts, there will be no overall improvement as 8 or 9 industries are still polluting. Therefore, why those one or two organisations should waste their resources?"*

Participants from the non-complying (with the existing laws) industries agreed that unless there are strict penalties for non-compliance, they will not invest in emission reduction projects. Like industries, NGO participants also believed that the environmental protection is a low priority of the government. Hence, regulatory bodies and mechanisms have not been strengthened to enforce the law. Environmental protection agencies lack the capacity as well as technical expertise to guide industries to comply with the law.

With regard, to climate change regulations, industries as well as stakeholders in the UK, generally, support emission trading over other type of regulations such as taxation or levies. The EU ETS, which was launched in 2005 with the objective of providing incentives for investment in energy-efficiency and low-carbon technologies at lowest cost, has been welcomed by industries and NGOs. However, after its first year of implementation, a number of flaws were observed. NGOs have voiced their concerns over its inefficiency in reducing emissions, while industries criticise different rules, depending on the sector they belong to.

In Phase 1 of the EU ETS, many member countries allocated quite generous caps. The results of the first year, published by the European Commission in May 2006, show that many countries have surplus allowances which in total equal to 44 million $CO_2$ tonnes. The results also caused significant volatility in the carbon market and suggested that many EU states had set their National Allocation Plans (NAPs) too high for Phase I to be effective.

Furthermore, NAPs for Phase 2 of many member countries' are also short of achieving net reductions in their national GHG emissions. Lax targets and generous caps have been criticised by NGOs. As one interviewee described, *"emission reduction through emission trading scheme is like a game of musical chairs: You have to remove the chairs as we go on; otherwise, it is never going to work."* Moreover, linking the scheme to finance though provides an incentive for some industries to cut emissions; other could manipulate these schemes to commercial advantages rather than the environmental advantage. This emphasises the need for an effective approach which balances the incentives with the emission reduction.

***d) Uncertainty Of Policies:***

'Uncertainty of policies and regulations' reappeared in every interview in the UK as the major issue affecting corporate decisions. The implementation of the EU ETS does not give industry certainty needed for major long-term investment decisions. This was the view of industries and of other stakeholders. As one UK NGO mentioned, "*the main barrier for industries is uncertainty in the market place as business is not sure how much to invest and in what time frame*." This is especially important here, given the long lead-in times and the long life expectancy of relevant equipment (25 - 30 years).

The allocations for second phase (2008 – 2012) of the EU ETS are now being notified, while it is not known what will happen after 2012. Therefore, industries are reluctant to decide when the shape and form of carbon market for even next five years is obscure. The result will be that industries will not be able to achieve higher reductions if they are mandated in EU ETS phase 2 and even phase 3. One participant described that "*because of the investment cycle and uncertainty, the reduction in GHG in phase 1 will come through minor energy efficiency, as there is no long-term investment for the sufficient abatement required.*" Some sectors also view that due to this uncertainty it is difficult for them to invest in Europe.

Uncertainty, especially with the CDM, is one of the reasons industries in the UK are not actively participating in CDM. As one interviewee mentioned, "*after carefully looking at the scheme and project, we came to conclusion that it is not a very effective way to make an investment when there are various uncertainties linked with that*."

**Economic Factors**

Economic factors obviously play an important role in business decisions and strategies. From the interviews, the following issues emerged which are related to economic factors affecting corporate strategies on environment in general and climate change in particular: a) cost of energy, b) carbon price, c) rate of return and capital cost of the energy-efficiency projects, and d) effect on competitiveness:

***a) Cost Of Energy:***

'Cost-savings' is the most important driver for the corporate activities regarding climate change for many organisations both in Pakistan and the UK (Jeswani *et al*., 2007), which are achieved either through reduced energy-intensity or switching to relatively cheaper fuels. As one participant described, *"Energy-efficiency is very important from cost saving point of view. Industry here (in Pakistan) is not aware of its related climate change or environmental impacts. Attracted environmental options are those where company can reduce its input costs hence can compete with others."* However, it should be noted that cost savings through energy efficiency are more important for businesses where either energy is significant part of their operational cost or where profit margins are low due to strong competition.

Recent increase in fuel price has revived the interest of organisations as well as individuals into energy savings. For example, in Pakistan, the 1st compressed natural gas (CNG) station was established about 20 years ago, but many people did not switch their cars to CNG until recently. In the past few years when the petrol prices have increased significantly, each year around 150 000 vehicles are converting to CNG (IANGV, 2006). Today, Pakistan has become the third largest user of CNG vehicles in the world after Argentina and Brazil, with a fleet of almost 900 000 numbers of CNG vehicles[3] (IANGV, 2006). As a result, some of the car producers have also started to manufacture CNG cars. Furthermore, one company (Hinopak) has now manufactured a prototype CNG bus.

The interviews showed that the energy efficiency projects are not uniformly attractive among all sectors in Pakistan. Industries that have relatively low profit margin and tough competitions have shown more interest in improving their energy-efficiency than others: "*By the fact that energy bills have increased so much so that it is difficult to compete in the international market*" stated one manager of textile (exporting) industry and he added that a proposal for cogeneration project was not well received a few years ago because its payback period was high. But with the increase in fuel price this changed in favour of the project. The regulatory agencies and NGOs also agreed that scores of industries are taking energy-efficiency initiatives for economic reasons. Several industries have replaced fossil fuel by rice husk (biomass) for their boilers; others have installed add-on on their boilers to reuse waste heat.

It highlights the fact that there are a lot of opportunities on energy-efficiency in Pakistan. However, in some sectors the high cost of fuel has negative impacts on environment and increase in GHG. Almost 80% of cement industries in Pakistan have switched to coal from furnace oil and natural gas, because of its low cost (Bhutto, 2005). Having access to cheap fuel and enjoyed a significant increase in cement price in past few years because of high demand, improving energy-efficiency is not on the agenda of cement industries.

Lower or no cost of energy was also mentioned as the main barrier by a participant from the oil and gas sector in Pakistan. The participant from the oil & gas sector mentioned that, as they use their own energy for their operational activities, they, therefore, see it as a free resource. Hence, it undermines the feasibility of the energy-efficiency projects.

These views were contested by a MNC in the UK in similar sector. "*In order to sell an energy-efficiency project, one has to count economic as well as other associated benefits such as all saved energy can be sold as a product; less energy usage means lower CO, $NO_2$ and $SO_2$ and other pollutants hence benefiting air quality and by implication on human health. Improved air quality means improved public perception about company activities and increases the reputation. That puts value on share price.*" However, these associated benefits have lesser value in other parts of the world.

***b) Carbon Price:***

In the UK, the financial effect of the EU ETS on company's climate change strategy is through a carbon price. Therefore, the success of the EU ETS in meeting its objectives also depends on the price level. Emission reduction projects, for the sectors, which are covered under EU ETS, are more attractive if the price of carbon is high to make emission reduction

[3] In comparison UK is 39th on that list with less than 600 natural gas vehicles (IANGV, 2006).

alternatives viable. As one participant described, "*the price of $CO_2$ will drive our choice of fuel to certain extent. The price of 15 euro/ tonne of $CO_2$ or above is a reasonably good incentive for us to increase the amount of biomass*[4]*.*"

The current carbon price, which is less than 1 € per tonne, would not provide enough incentive for all organisations to reduce emissions. For example, in 2006 the Drax Power station, the single largest $CO_2$ emitter in the UK, abandoned it strategy of using biomass fuel, in favour of buying carbon credits instead (MacAlister, 2006). Also, the demand for other cleaner energy sources, such as renewable sources of energy, is still limited. At this moment in time, hydrocarbon fuels are still fuel of choice for domestic as well as industrial consumers around the world. They are less expensive than other energies because the true environmental and social costs of carbon are reflected into their price.

***c) Rate Of Return And Capital Cost Of Energy-Efficiency Projects:***

In Pakistan, in the absence of any external pressure, energy efficiency and GHG reduction projects have to pass the tough economic test. For many industries, these projects have relatively lower rate of return in comparison to core business activities, especially when the price of their products (for example, oil & gas, cement, sugar) is at an all time high. Therefore, financing these projects has more hurdles as the companies have strong inclination to invest the limited capital for priorities with a stronger business case. "*It makes more business sense to invest available capital into an additional plant than into upgrading the running plant for energy-efficiency*" remarked one interviewee from a cement industry in Pakistan. Similar views are shared by oil and gas industry in Pakistan: "*It is difficult to justify with the partners', more preference for them will be to invest in projects with high and instant return rate rather than investing e.g. on flaring reduction projects, which have relatively high payback period.*"

There are some examples where companies have overcome this problem using innovative schemes: one MNC has access to the parent company's internal funds, which were setup to finance emission reduction projects within their international business. Through that financing system, funding is available for GHG reduction projects, which cannot be justified due to economic reasons (high capital cost and comparatively low rate of return). That organisation's experience with internal carbon financing activities suggest that if industries have access to external funding, such as provided under CDM, they can substantially reduce their carbon footprints.

***d) Effect On Competitiveness:***

The effect on competitiveness in the UK from climate change policies (EU ETS & CCL) varies between sectors. Some reports suggest that some sectors can make a lot of windfall profits (IPA Energy Consulting, 2005). At the same time, some industries are of the view that the policies are hurting their commercial viability by reducing their profit margins. There are also concerns in some sectors that regulations, such as EU ETS, could drive business to overseas, resulting in closure of production and manufacturing facilities leading to unemployment in the country. A good example is the cement industry, which argues that it is difficult for them to pass the extra cost of carbon on customers because cement is a low value product with limited ability to absorb additional costs. British Cement Association argues that emissions trading at 15 1 € / tonne $CO_2$ will approximately increase the variable

[4] Biomass is considered carbon neutral under the EU ETS, while other waste derived fuels are not.

cost of cement production by the same amount as one tonne of cement manufacturing generates about one tonne of $CO_2$ (House of Lords, 2004). As the transportation cost per tonne of cement from the Far East is similar in range, hence will attract imports from other countries, where the cost of production is low because of less strict environmental regulations. The net effect on global GHG emissions will be redistributed and in some case could become worse because of increase in GHG emissions from shipping, lower production efficiency, etc.

Also, the issue of emission allocations in different countries under EU ETS could affect competitiveness: industries in countries where allocations are not as generous may have to buy emission credits to meet those caps from industries in other countries that have surplus emission credits to sell. These credits will not necessarily come from investment in new efficient plants and low-carbon technologies but could be because of generous allowances in those countries. As a result it will not reduce GHG emissions but will affect the competitiveness of those industries which will bear the additional cost, while others will make windfall profits.

**Social Factors**

The interviews highlighted two important factors that affect business strategies: a) societal awareness and b) role of NGOs & other stakeholders.

***a) Societal Awareness:***

A participant from a refinery in Pakistan stated,
*"There is no external pressure on us from the public, because the awareness is very low. Nobody knows what we are doing; whether we are producing leaded fuel or lead free, high sulphur or low sulphur, high aromatic or low aromatic."*

The public can influence business environmental strategies directly in the form of campaigning against organisations activities or impacts. It is generally exercised for local environmental impacts especially by local communities living around the industrial plants, while some pressure groups also campaign against global impacts such as climate change. However, the level of influence or pressure on a company to improve their environmental performance depends on the level of public awareness as well as concerns for the degradation of their local environment. In Pakistan, this pressure on businesses is almost non-existent as affected public is either unaware of the environmental impacts of the business or unconcerned about the impacts.

On the other hand, in the UK, though there is much greater general awareness on climate change as an issue across society, the pressure on industries is generally limited to local or regional impacts. For example, interviews from cement and power generation industries mentioned that they feel more pressure on their emissions of black smoke, CO, dust, $SO_2$ or $NO_X$ but not $CO_2$.

An increasingly aware public can influence corporate behaviour indirectly as well i.e. via the market or via the democratic process. For instance, in the case of CNG vehicles in Pakistan, consumer demand has created a market for low-carbon products and services. It was also mentioned earlier that the prime reason for that is not consumer awareness for global or even local environmental impacts but overwhelmingly cost savings.

It is also felt, that despite the increased awareness about climate change in the UK, public's awareness regarding how they can minimise their own carbon footprints is limited. Also consumers are making choices on goods and services primarily on price and not for their GHG emissions. Consumer choices made primarily on price do not always result in positive impacts on climate change as most of the low-carbon goods and services are relatively more expensive. As one industry reported in response to the comments on recent Energy review, "*public awareness of the issues is rising all the time but, because the effects of climate changing emissions are slow to arise and are cumulative, the public is unlikely to accept significant reductions in prosperity or changes of lifestyle in order to address the problem*."

Changes in consumer behaviour cannot only affect the impact on global environment but also the way business is being run. However, to make informed choices consumers need information on how their consumption behaviours impact on the environment and an impetus to act. That puts the onus on companies to provide the information about the carbon footprints of their products and services to consumers together with information on how individuals can make a difference. This becomes more important when companies require general public to contribute in reduction of GHG emissions.

***b) Role Of NGOs and Other Stakeholders:***

In Pakistan, the scope and area of the work of environmental NGOs is limited, hence their influence remains minimal. Most of NGOs are either focused on green issues (nature conservation) or conducting studies to influence national development policies, but also to a lesser degree on promoting awareness on cleaner production through trainings, workshops and conferences. These programmes are mainly funded by international donors. Also there are some programmes, which provide technical guidance to industries on cleaner production. However, during visits to various industries it became evident that the effectiveness of their programme is limited to only a small number of participating organisations in few sectors.

In the UK, besides organising various campaigns, the NGOs role in influencing industries mainly comprise of bringing the impacts into public knowledge which also stimulates the policy debate. One of the recent examples is the WWF's campaign on '*Power Switch*', which targets power industries. The big power companies in the UK are ranked annually for their efforts in reducing GHG, improving energy efficiency investment in renewable energy and their capacity to produce energy using efficient process, for example, combined heat and power generation. This increases pressure on industries to improve their performance as indicated in discussion with energy industries. As one representative stated, *"We have high carbon intensity so we have quite a bit of pressure from NGOs."* Companies, which are ranked as top in those reports, are eager to share this achievement as an external credibility of their performance, which puts pressure on them to continue or increase their efforts to maintain that position.

In general, industries in the UK have mixed feelings about the role of NGOs. Some large companies have developed partnerships with NGOs and joined their programmes to reduce emissions. There is an understanding that their role is important but at the same time there are concerns that the NGOs do not understand industry's constraints. For instance: "*We are always seeking the opportunities for reduction of GHG, while we have the awareness that we are not an environmental company. Like all other business ours is also a business of making money and to provide returns to investors."*

NGOs would argue that they are not asking them to commit commercial suicide but at the same time they want them to be innovative and move to new business models, in a way that reduces their environmental impact and lowers costs. Hence, businesses with a long-term focus find investment in renewable technologies more viable than those with a short-term focus. However, NGOs are not very hopeful on businesses changing course without government interventions and regulations or changing radically. One NGO participant commented on oil and gas companies' climate change strategies, *"We do appreciate that some have very good campaign to engage customers so that they understand what their carbon footprints mean. But a bulk of their investment is in fossil fuel. The investment in alternative energies is minimal, like a drop in the ocean."*

**Technological Factors**

Technological limitations were identified as an important factor by participants in Pakistan affecting the energy consumption in industry. As one participant stated, *"Many industries here (in Pakistan) have old and rusty machinery, which is a major cause of energy loss in our industries. Especially the boilers in our industries are very old and waste precious energy. Most of them are without any instruments to control burning. Therefore inefficient combustion remains undetected."*

Pakistan like other many developing countries did not participate in the wave of energy efficiency investment that occurred (mostly in OECD countries) after the oil price shocks of the 1970s and 1980s. Even more recently, due to financial and technical constraints, industries have installed inefficient equipments and machinery. As a result, Pakistan has one of the highest energy intensity ratios in the world – more than 5 times than Japan (Asian Development Bank, 2005). Highly inefficient energy usage and increased industrial activities are some of the major causes of deterioration of ambient air quality in Pakistan (Khawaja and Khan, 2005).

In the UK, some of the industries claimed that they have already been using best available technologies and further improvements are very limited. These industries can now identify CDM projects to cost-effectively reduce their impacts (as well as meet their legal requirements) by transferring available knowledge and technology. Technology or knowledge transfer under CDM can help business in developing countries to improve their performance. The following section discusses some of the examples of technologies, which are being used by UK industries successfully, which can be introduced in Pakistan or their use can be made more widespread.

*Use of alternate fuel:* In Europe, cement industries extensively use waste derived fuels such as used oils, spent solvents, used tyres, palletised sewage sludge, meat and bone meal, packaging and refuse derived fuel (Pocklington and Leese, 2005). Cement industries in Pakistan can benefit from learning the use of these fuels in their kilns. It has twofold benefits: firstly the use of fossil fuel will be avoided; and secondly it will help in solving the problem of waste disposal as well. Given the high kiln temperature, there is also the chance to burn special wastes. Similar projects have also been registered as CDM project in India[5].

*Cogeneration:* Any medium to large sized industrial plant which uses both heat and electricity for their processes can use cogeneration to improve their energy efficiency by up to 30 percent. Cogeneration (called combined heat and power, or CHP, in the UK) is a highly fuel-efficient technology that uses the heat - produced as a by-product of energy generation - that would normally be wasted to the environment. Though it has use in most industrial sectors, especially sugar industries can benefit more by installing bagasse cogeneration plants as bagasse is considered carbon neutral. They can sell their surplus electricity to the grid, recently allowed by the government. Also in industrial clusters, power

[5] http://cdm.unfccc.int/Projects/index.html

companies can install these plants to provide both heat and electricity to the industrial consumers. The additional advantage for the power companies will be a reduction in line losses as the supply will be close to the generation sites.

## CONCLUSIONS

This paper presented the influence of policies, regulations, economic considerations, societal pressure and technological options on corporate strategies towards climate change. The analysis also revealed that these factors are interlinked with each others. Both in Pakistan and the UK, economic factors emerge as very important factors behind business strategies. The extent to which economic factors influence industries depends on strength and content of policies, technological and social factors, which vary significantly between Pakistan and the UK.

In the absence of regulations and societal pressure in Pakistan, presently the dominant factor influencing business strategy is 'cost-savings' through energy efficiency projects. The uptake of these measures can be further promoted by strengthening the influence of political factors and removal of technological barriers. Firstly, there is a need of recognising this aspect in national policies and developing a national programme to improve energy-efficiency, initially focussing on energy-intensive sectors. To increase the awareness about available opportunities and identify those, support in the form of conducting energy audits and preparing GHG inventories will be required. Those opportunities should be further evaluated on the basis of financial and technological requirements. Companies should be encouraged to participate in CDM to overcome the financial and technological barriers. Therefore, the programme should offer the required assistance in developing CDM projects. However, to gain buy-in from industries, setting mandatory energy efficiency requirements for energy-intensive sectors along with the mechanisms to enforce them will be required.

In the UK, the climate change policies are designed to influence business through carbon price. But the effect of carbon price in changing business behaviours is so far limited because of very low price of carbon and short-term outlook of policies. As a result, the scheme, such as EU ETS, does not provide enough incentive to companies to change from 'business as usual'. There is, thus, a need for a longer-term policy with stringent targets for reductions of GHGs from different sectors, which could contribute to increased investment into low-carbon technologies. Considering the scheme is at EU level, to give a level playing field to business and to avoid distorting the competition, these EU ETS rules should be strengthened so that member countries do not allocate generous allowances to their industries.

The success of international policies on climate change depends on the effectiveness of national policies and their successful implementation. The idea of CDM in Kyoto protocol was incorporated because it was recognised that it will be too difficult and more costly for industrialised countries to comply with their specific Kyoto commitments and at the same time it will assist developing countries to achieve sustainable economic growth. However, both in the UK and Pakistan there is a lack of interest by industries as well as other concerned organisations. This raises the questions on the effectiveness of this mechanism as well international cooperation in combating climate change and achieving the objective of sustainable economic growth.

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