Overview of competitiveness issues in Poland

In the absence of a single global carbon price, the competitiveness impacts of domestic climate policy and pricing are often cited as a concern by industry. A number of studies have explored this issue in depth for regions where carbon pricing exists or is being developed. They have revealed that based on current carbon prices, the impacts are usually confined to only a few subsectors of the economy. Unfortunately due to data constraints, it was not possible to replicate the methodology used in these studies for Poland. Instead, this short paper examines the GHG profile of manufacturing sectors in Poland and assesses which of them may merit further study into the competitiveness impacts of carbon pricing. We identified iron & steel, nitrogen fertilisers, cement and lime, basic inorganic chemicals, pulp and paper as sectors which require further analysis. In addition to this, the literature suggests that the aluminium sector is commonly at risk of competitiveness concerns. Although we were unable to source any suitable data for this sector, because of differing MRV approaches amongst installations, it is recommended that this sector is assessed in further detail as well.

Introduction

Competitiveness is an important concept at both the economy and industry level. At the country-level, an uncompetitive economy would have lower GDP or employment rates with the quality of life of its citizens diminishing over time. At a firm level, uncompetitive companies may lose market share, have lower profits and, at worst, may shed staff, close down or relocate abroad. A number of definitions for competitiveness are commonly used but there is no universal consensus on the term. This paper will attempt to draw on some of the most commonly used theories.

Macro-level definition

The World Economic Forum offers a clear and succinct definition of macroeconomic levels of competitiveness, proposing it is "*the set of institutions, policies and factors that determine the level of productivity of a country".* Productivity in simple economic terms is the value of goods and services (output) generated per unit of a country's input to production (human, physical and natural capital). A country's relative productivity can be viewed as a proxy for relative competitiveness and can be assessed using a combination of socio-economic variables[1]. Often, an index of measurements will be used to reflect the multiplicity of the issue. However the complexity and comprehensiveness of this measurement is rewarded by the depth of insight it can offer about a country's economic prosperity. An economy which is relatively more competitive than its counterparts abroad will be more prosperous and its citizens will have both a high level of income and standard of living. An economy that continues to be competitive over time will also have strong returns to investment which allows for an improvement in the nation's standard of living in the future.

Micro-level definition

A firm or sector that is relatively competitive in the production of a particular good or service is said to have comparative advantage and will increase its global market share of production through trade. Again, we can turn to the more easily measurable "productivity" to approximate a sector or firms level of competitiveness relative to their counterparts abroad e.g. value or cost of a product per unit of input. However, as with macro-level competitiveness, this uni-dimensional approach which focuses on costs is insufficient for explaining why domestic production may still continue to grow even in light of international firms with apparent comparative advantage. Again, a range of factors must be considered which offer more insight on why a less productive firm or sector may continue to be competitive. The Carbon Trust[2] offers a list of some of these and suggests that; transport costs, the balance between capacity and consumption, import restrictions, instability, product differentiation and marketing, brand

[1] The World Economic Forum suggests assessing, weighting and aggregating the following components which determine competitiveness: institutions, infrastructure, macroeconomic stability, health and primary education, higher education and training, goods market efficiency, labour market efficiency, financial market sophistication, technological readiness, market size, business sophistication and innovation.

[2] The Carbon Trust (2008)

reputation and service differentiation may also affect how competitive a firm or domestic sector is in the international market.

This introduction to competitiveness is crucial for understanding the complexity of its drivers and their interactions. Climate policy is only one of a number of these factors that may affect the competitiveness of a country's economy or domestic sectors. International trade theory suggests that those domestic sectors which are CO2 intensive and trade exposed will be at a competitive disadvantage if their competitors abroad do not face similar carbon pricing[3]. In addition to industry fears, in a world of unequal carbon prices, there is the environmental threat of so-called carbon leakage. This is the situation where there are either increased imports from, or relocation of industry to countries that don't face such stringent carbon prices. Emissions in these countries would increase with production, negating any impact of reduced emissions derived from domestic climate policy; rendering it ineffective from a global environmental viewpoint.

Several studies have been undertaken to examine this issue where carbon pricing already exists, predominantly in the EU, and evidence to date has suggested that realistic current and future carbon prices would only pose a threat to competitiveness for a few subsectors of the economy for those countries with or anticipating carbon pricing. This is due to a number of factors including cost differentials due to labour and other input costs such as raw materials will frequently outweigh any international differences in the cost of carbon.

This short paper hopes to build on the body of existing literature by examining the nature of Polish GHG emissions. It was not possible to replicate the analysis undertaken by Climate Strategies for similar studies[4]; creating a histogram identifying industrial subsectors most at risk of competitiveness and leakage concerns. This was due to significant data constraints at high levels of sector disaggregation. Instead, this report will give an overview of the experience with carbon pricing in Poland to date and make some assertions about how this might change in the future. In addition this report will give an overview of the region's GHG emissions profile and emissions intensity of certain subsectors, scoping out which of these may benefit from a deeper study to examine how carbon pricing may affect their competitiveness.

Country Specific background

Poland's GDP has risen steadily since its transition to a market economy in 1990. Its economy has grown at an average rate of 4.6% per annum between the years 1996-2007 and currently has a GDP per capita of approximately US $11,880[5]. It joined the EU in May 2004, which led to a boost in economic growth and a fall in the unemployment rate (froom 19% in 2004 to 7.1% in 2008[6]). Poland intends to join the Euro by 2012. Its main export partner is Germany (24.9% of exports and 28.3% of imports) and the commodities it exports are mostly manufacturing equipment and goods[7].

Poland is the 9th largest producer of coal in the world[8] and the largest producer of anthracite (high quality) coal in the EU. Unsurprisingly, the abundance of this natural resource means Poland is largely energy independent and a net exporter of coal. Coal features significantly in the Polish energy mix (approx 92% in 2004) though the use of other energy sources (oil, gas and renewable energy) has also increased in recent years[9], along with the absolute levels of electricity produced. The power sector in

[3] A number of studies have been undertaken which explore the prevalence of this hypothesis amongst firms in the EU covered by the EU ETS, who face a fluctuating carbon price. Please see Climate Strategies (2008), Hourcade et al. for a literature review of some of the key studies undertaken to date.
[4] Please see Climate Strategies, Hourcade et. al (2008) for the methodological approach
[5] World Bank country fact sheet
[6] Source: Eurostat database on unemployment levels, available at: http://epp.eurostat.ec.europa.eu/
[7] https://www.cia.gov/library/publications/the-world-factbook/geos/pl.html
[8] EIA, International Energy Annual, Short Term Energy Outlook, Table 3a, Table 3b
[9] European Commission- Energy fact sheet for Poland, available at: http://ec.europa.eu/energy/energy_policy/doc/factsheets/mix/mix_pl_en.pdf

Poland is expected to grow in the coming years and extra capacity requirements may lead to issues regarding security of supply.

Even though the Polish economy is the 3rd most carbon intensive[10] in Europe, Poland's emissions have actually fallen by 15% since 1990[11], following the decline of energy inefficient industries and the restructuring of the economy. Poland has committed to the EU target of reducing their energy consumption by 20% on Business as Usual levels in 2020 and so is compelled to continue to introduce these energy saving initiatives. It should not have little difficulty reaching its Kyoto target of -6% on 1990 levels as average emissions between 2003-2006 were 30% below the 1990 base year.

Key Findings

Unfortunately, within the scope of this work there were significant data constraints for Poland which limit the assessment one can make about the impact of carbon pricing in the country. A number of sources were explored for data but the information that was located was for different years and is incomplete in its coverage of manufacturing subsectors. The most comprehensive source of gross value added (GVA) data available was for the year 2004 but this only represents 11% of GVA for that year. In addition, there seems to be little consistency with sector definitions between sources, which makes it difficult to construct a complete data set from different sources. The lack of consistent definitions also makes comparisons between EU countries difficult. The methodology used in Hourcade et al (2008) was replicated for Germany, Poland's largest trade partner; it would have been very insightful to compare these two countries' subsectors' value at risk from carbon pricing as a precursor to examining their trade relationship in more detail. The difficulties of acquiring this particular data set exemplifies the much larger issue of the need for adequate and consistent monitoring, report and verification provisions (MRV) embodied in climate policies to allow for a real and in-depth impact assessment of carbon pricing.

As a new EU Member State, Poland is a participant in the EU ETS and has faced carbon pricing since the scheme's inception in January 2005. The scheme covers approximately 12,000 installations across 29 countries and is currently in Phase II. In 2008, there were 629 installations covered by the scheme in Poland[12]. Phase III of the EU ETS is due to start in 2013. The phases are important opportunities to refine the scheme's design to increase its efficiency and effectiveness as a mechanism for mitigating emissions in the EU area. It is hoped that the proposed ajustments to the permit allocation methodology in Phase III will at least partly address the issue of windfall profits that were enjoyed by power companies. Poland along with 9 other Eastern European Member States successfully lobbied against the European Commission's decision to introduce 100% auctioning in the power sector in 2013, instead arguing for a gradual introduction so that there is more time for the sector to adapt.

Between the years 2005-2007, Poland's allowances were larger than their verified emissions and so they had a surplus of EU emissions allowances (EUAs) to sell in the market. 2008 saw a reversal in this trend as National Allocation Plans were made more stringent. However, the difference between allocated allowances and emissions was relatively small compared with other Member States. Poland's most recent National Allocation Plan has been rejected on the principle basis of it being too generous[13]. It appears that Poland's relatively favourable experience of the earlier phases of the EU ETS has led to a demonstrable reluctance from both Polish government and firms to adopt more stringent regulation in the near future.

It is quite possible that this reluctance is due to the likely disproportional impact that carbon pricing could have on the Polish economy relative to other less carbon intensive European economies. However, evidence suggests that Poland could still enjoy comparative advantage in mitigating emissions because

[10] Climate Analysis Indicators Tool (CAIT, 2010)
[11] http://www.eea.europa.eu/themes/climate/ghg-country-profiles/tp-report-country-profiles/poland-greenhouse-gas-profile-summary-1990-2020.pdf
[12] Source: EEA data service
[13] National Allocation Plans are soon to be replaced by a centrally calculated method in Phase III of the EU ETS.

of a relatively favourable 1990 baseline year which has afforded them a surplus of Assigned Amount Units (AAUs). In November 2009, Poland sold AAUs to Spain worth €25 million and is anticipated to make an additional sale to Ireland early in 2010. The Joint Implementation database lists 14 approved projects in Poland with a combined potential earning of 16.42 million ERUs (Emission Reduction Units) over 2008-2012. These profitable mitigation opportunities are being seized upon by Poland but need to be viewed as an interim buffer in anticipation of stricter climate policy[14]. They should incentivise restructuring of production practices in a timely manner so that Poland can continue to reap the benefits of carbon pricing through low carbon technologies and production practices.

The macroeconomic view of carbon pricing in Poland is important but in order to identify where there are potential competitiveness and leakage concerns, a micro-level approach must be taken to pinpoint the exact sectors of the economy at risk. As aforementioned a lack of suitable data limits this analysis.

Chart 1 – Emissions from Polish Industry[15]

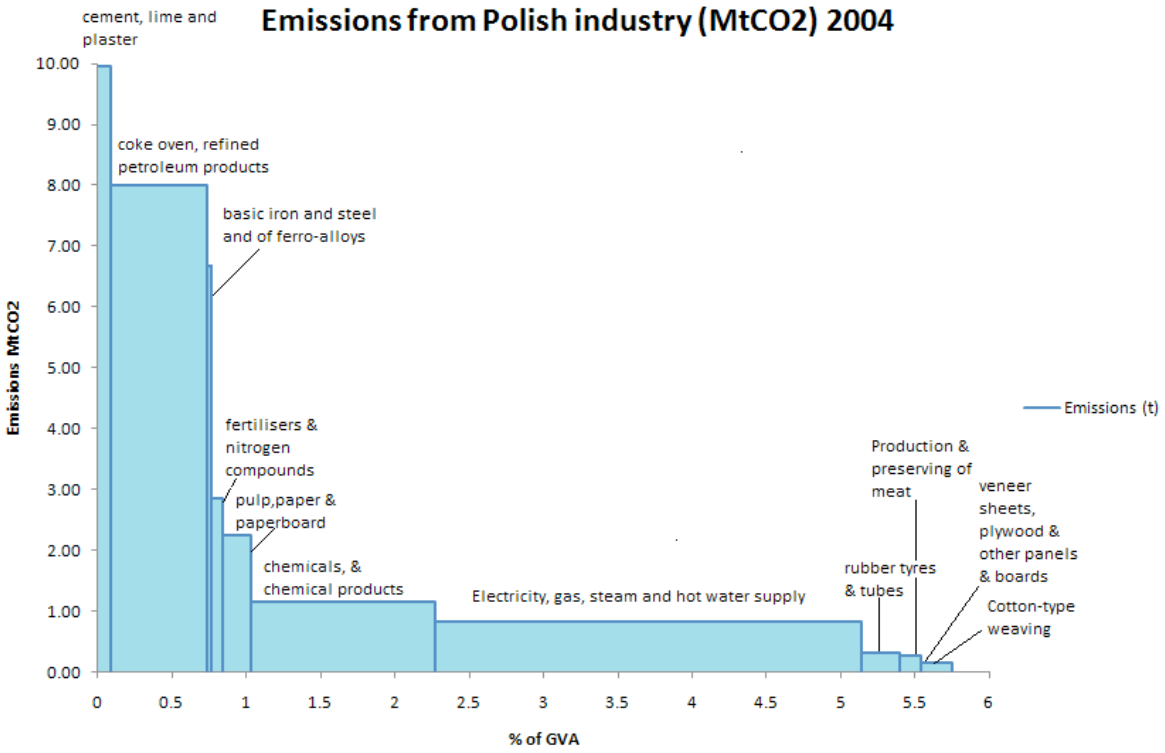

Chart 1 is a variation on the analysis in Climate Strategies' Hourcade et al (2008)[16].

It shows emissions from subsectors of the economy and the contribution they make to GVA[17], offering a deeper insight into the sources of Polish industry emissions (which have been rising in recent years[18] even though country level emissions have been falling). Both the Carbon Trust and Climate Strategies have undertaken analysis on the competiveness impacts of carbon pricing in different regions[19]. A

14

15 Please note that this chart is not a comprehensive overview of the Polish economy. It represents approximately 6% of the GVA for the year 2004.

16 Hourcarde et al. (2008) identifies which subsectors are at risk of competitiveness concerns by calculating the cost increase brought about for a region's industry for a specific cost of carbon (assuming no free allocation) as a percentage of a sectors Gross Value Added. The horizontal axis indicates the percentage that each industrial sector contributes to the region's overall GDP. The area of each column is proportional to the CO_2 emissions from each sector.

17 Gross Value Added measures the contribution of each individual producer, industry or sector to a region's economy. It can be used as part of an estimation of Gross Domestic Product (GDP), depending on the GDP accounting method, which is a key indicator of the state of the economy. A region's GDP is equal to GVA (at current basic prices) plus taxes on products, minus subsidies on products.

18 Polish industry emitted 34.7 million tonnes of CO2e in 2008 which was a 4.7 per cent gain from 2007 levels

19

number of sectors have been identified as commonly at risk. These are iron & steel, aluminium, nitrogen fertilisers, cement and lime, basic inorganic chemicals, pulp and paper. In Chart 1, both cement and lime production and basic iron and steel are identified as emissions intensive sectors that make only a small contribution to GVA. Conversely, chemicals and chemical products along with electricity, gas, steam and hot water supply make up a relatively large proportion of GVA but involve a less emissions intensive production process. Nitrogen fertilisers and pulp and paper are also identified in Chart 1 as being relatively emissions intensive production practices. Due to data constraints, it was not possible to examine the emissions structure of the aluminium sector. In previous studies of other regions, these sectors at risk generally make up less than 1% of all of the area's GDP[20]. It is clear from Chart 1 that their contribution to national GDP is larger in Poland, it is therefore possible that any competitiveness impacts from carbon pricing would have larger impacts on macroeconomic variables such as employment.

Following this initial scoping exercise, to fully examine the nature of any potential competitiveness concerns, it is recommended that further detailed analysis is required in each of the 6 sectors. Each process in the production chain for these sectors will be differently affected by carbon pricing and so an in-depth understanding of how the sector operates will facilitate a targeted policy response to address concerns. The level of trade intensity should also be assessed to contextualise the sector description in relation to its competitors abroad.

Conclusions

This prelimanary analysis shows that:

1) There are significant data constraints which limit any analysis on the impact of carbon pricing on Polish industry

2) Understanding the micro-level impact of a cap-and-trade scheme is crucial for developing suitable policy responses and so it is recommended that MRV provisions in the region are strengthened.

3) Using very simple modelling techniques, it is evident that the sectors that require further analysis about the potential impact of carbon prices are broadly similar to those identified as being at risk in more comprehensive studies undertaken for the UK, Japan, Germany and the US.

4) There is mixed evidence about the short term impact of carbon pricing in Poland. Although the area is relatively carbon intensive and should therefore be disproportionately affected by carbon pricing under the EU ETS, its favourable 1990 baseline has led to the sale of a large amount of AAUs. Similarly, it appears to have a number of low-cost mitigation options and is a popular location for Joint Implementation projects.

5) To date, Poland has largely enjoyed favourable circumstances under the EU ETS. However, future phases are likely to be more stringent than previous ones. The inevitability of carbon pricing and climate policy in Poland should serve as a strong signal to transform the economy in the long term and continue to enjoy the benefits of a relatively favourable 1990 baseline.

[20] Climate Strategies (2009), Grubb. M & Sato. M

References

Climate Analysis Indicators Tool (CAIT US, 2010) Version 3.0. Washington, DC. World Resources Institute

Climate Strategies (2009), Dröge, S. et al. *Tackling Leakage in a World of Unequal Carbon Prices*, Cambridge, UK
http://www.climatestrategies.org/our-reports/category/32/153.html

Climate Strategies (2009), Grubb. M & Sato. M *Ten (plus one) insights from the EU Emissions Trading Scheme – with reference to emerging systems in Asia*, Cambridge, UK
http://www.climatestrategies.org/our-reports/category/17/235.html

Climate Strategies (2007), Hourcade et al. *Differentiation and dynamics of EU ETS industrial competitiveness impacts"* Cambridge, UK
http://www.climatestrategies.org/our-reports/category/6/37.html

EBRD – Country overview, Poland, available at:
http://www.ebrd.com/country/country/poland/econo.htm

European Commission- Energy fact sheet for Poland, available at:
http://ec.europa.eu/energy/energy_policy/doc/factsheets/mix/mix_pl_en.pdf

European Commission – Press Release
http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/1907

European Environment Association – Data service
http://dataservice.eea.europa.eu/PivotApp/pivot.aspx?pivotid=473

Eurostat databases – information accessed on unemployment and emissions data
http://epp.eurostat.ec.europa.eu/

Faggio. G (2001), *"Effects of trade and technical change on the labor market",* Centre for International Economics and Shipping, Norwegian School of Economics and Business Administration

Grubb. M et al. (2009), *Climate policy and industrial competitiveness – ten insights from Europe on the EU Emissions Trading Scheme,* Climate Strategies and The German Marshall Fund of the United States.
http://www.climatestrategies.org/our-reports/category/17/204.html

Point Carbon – European Press Release
http://www.pointcarbon.com/news/1.1383984
http://www.pointcarbon.com/news/1.1367226
http://www.pointcarbon.com/news/1.1323574
http://www.pointcarbon.com/news/1.1285777
http://www.pointcarbon.com/news/1.1195188
http://www.pointcarbon.com/news/1.1199713

The Carbon Trust (2008), "*EU ETS impacts on profitability and trade – a sector by sector analysis"*

The World Bank – country study – Poland: http://go.worldbank.org/AIP9ARRJW0 (accessed Jan 2010)

Climate Strategies aims to assist governments in solving the collective action problem of climate change. It connects leading applied research on international climate change issues to the policy process and to public debate. All views expressed are personal. Climate Strategies does not take positions on policy issues. Further reports on the topic may be found on ww.climatestrategies.org