IMAD Working Paper Series
http://www.umar.gov.si/en/publications/working_papers

Mojca Vendramin, Ivanka Zakotnik, Katarina Ivas

The Impact of Emissions Trading on Slovenian Industry

Working Paper No. 10/2008, Vol. XVII

Summary

On the basis of the Spring 2007 European Council Conclusions, the European Commission put forward a far-reaching climate and energy package of draft legislative proposals to achieve a 20% reduction of greenhouse gases by 2020 compared to 1990 levels and 20% renewable energy by 2020. The Emissions Trading System is the key tool for cutting emissions cost-effectively and covers 40% of total emissions, which must be cut by 21% by 2020 compared with levels in 2005. The system involves the power sector and all major industrial emitters.

The "Climate action and renewable energy package" envisages auctioning emissions allowances from the start of the new regime for the power sector. Other industrial sectors will step up to full auctioning gradually, from 20% (remaining allowances will be allocated free of charge) in 2013 to full auctioning in 2020.

Carbon leakage means moving production to countries without (or with lower) commitments to reducing greenhouse gas emissions. This can occur due to higher costs of production in energy-intensive industries. Higher costs will be the result of two effects: the direct impact of emissions trading, i.e. purchasing of emissions allowances, and the indirect impact of higher energy prices, especially electricity. To prevent carbon leakage, the Member States reached an agreement on free allocation of allowances to sectors exposed to a significant risk of carbon leakage up to 2020.

The analysis of the cost structure of Slovenian industry in 2005 assesses the cost of purchasing emissions allowances at the level of EUR 20/tCO2 to these industries. This represents the direct impact of emissions trading. Results show the highest impact in lime production, at the level of 63.1% of their value added. The second sector according to the level of impact is the production of cement, followed by the production of organic basic chemicals. In manufacturing and construction together, the impact would be at the level of 1.1% of the value added in 2005.

To quantify the indirect impact on production costs, the effects of emissions trading on electricity prices have been analysed. Theoretical as well as empirical evidence for EU electricity markets show that the level of pass-through of emissions allowances to electricity price depends on market structure and energy sources for

marginal production. We assumed a 50% pass-through for Slovenia, as the electricity market is still highly concentrated. A third of power production is coal-based, which at the same time is obsolete and highly emissions-intensive. At the price of allowances of EUR 20/tCO2 and a 50% pass-through, this means a EUR 11.3/MWh higher electricity price. This corresponds to a 15% increase in the price of electricity (without taxes) for typical industrial end users in 2007. It is in line with the cost analysis for the power sector based on 2005 data, which show that the cost for emissions allowances at EUR 20/tCO2 would represent 20.5% of the value added of that sector. Internalisation of that cost into power prices would result in a 20% increase in 2005. This also represents our assumption for calculation of the indirect impact of emissions trading on Slovenian industry.

The analysis shows that the cumulative impact of emissions trading, direct and indirect – due to the electricity price increase, would result in higher costs in emissions and energy-intensive industries amounting to 14.7% relative to gross value added. These are sectors where impacts exceed 4% of value added, which in the foreign literature represents the threshold level for sector exposure. The highest impact (70.7% relative to value added) would occur in lime production, followed by cement, aluminium and basic organic chemical production. Slovenian manufacturing and construction together would be faced with a cost increase equalling 2.1% of their gross value added. Based on currently available foreign studies, these estimates are similar to results for Germany.

The sectors for which our calculations show more than a 4% cost increase relative to value added due to emissions trading (with a price of allowances of EUR 20/tCO2 and a 20% electricity price increase) employed around 14,300 people, or 1.5% of all employees in 2007. Their share in gross value added of manufacturing was 8.9% and 1.8% in GDP in 2007.

If higher costs deteriorate the competitiveness of industries and result in moving to other locations, carbon leakage also depends on the trade dependency of non-EU markets, where carbon costs have not yet been introduced. International trade data show that all exposed sectors except the first two (lime and cement production) and the manufacture of bricks, tiles and baked clay, are highly export-oriented, realising between 63 and 93% of sales on foreign markets. Among these are the manufacture of ceramic tiles and flags, production of basic inorganic chemicals and the manufacture of household and sanitary goods, most oriented to non-EU markets. At the same time, the latter sectors recorded low or even negative operating profits. Despite the fact that these industries do not represent a significant share in the value added of manufacturing, they do employee around 1700 people.

Very highly export-oriented, but mostly on EU markets, are two sectors which are also among the most exposed: aluminium production and the manufacture of organic basic chemicals. As they depend mostly on EU markets, this means the possibility of secondary carbon leakage, i.e. losing EU partners and consequently moving production into countries where emissions costs are not yet internalised. The major difference between these two production sectors is that in aluminium production more than half of impacts are indirect, i.e. higher electricity prices, while in the production of organic basic chemicals almost the entire impact derives from the cost of purchasing emissions allowances. This means that the impact on organic basic chemicals production will be significantly lower if emissions allowances in exposed industries are allocated free of charge (as envisaged in the draft ETS Directive). In aluminium production, where the indirect impact is greater, exposure could be reduced through lower electricity prices or state aid as proposed by the ETS Directive. This means that carbon costs will be passed through to other electricity consumers or to another part of the

economy. As the share of aluminium production in the Slovenian economy is relatively higher than the EU average, the indirect impact of emissions trading in Slovenia will be higher than in other EU countries.

The production of cement and lime is extremely non-export-oriented, so the possibility exists in these sectors of passing through carbon costs into product prices. However, in that case these products can be displaced on domestic markets by producers from non-EU countries. This represents a realistic option for Slovenia due to the presence of neighbouring non-EU countries; nevertheless, these two production sectors realise above-average profit margins, so the need for increasing product prices is less. Furthermore, through the proposed free-of-charge emissions allowances for exposed industries, the direct impact of emissions trading, which is the highest in lime, cement and organic basic chemicals, will be eliminated.

Presented analysis is cost analysis made on the cost structure in 2005, so beside costs the other also important drivers of competitiveness are not taken into account. They are only mentioned in last chapters, mostly in the framework of long-term energy projections. These projections show that by current policy in Slovenia CO_2 emissions of those in involved in emission trading will be increased to 2020 instead of declined. This indicates the possibility that impacts of emission trading will be higher than assessed by this analysis. By free allocation of emissions allowances to sectors exposed to significant risk of carbon leakage, direct impacts on those industries will be diminished. But cost of emission reduction will be passed to the whole economy, which will induce indirect impact on industry. Due to that comprehensive analysis of impacts of emissions trading on the whole economy is needed. Only on the basis of such analysis efficient development policy for transformation to low carbon society could be established.