PRICE CONTAINMENT IN PRACTICE - WHAT DOES EXPERIENCE SHOW?

2. PRACTICAL UNDERSTANDING OF PRICE CONTAINMENT HAS BEEN GAINED FROM EXPERIENCE AROUND THE WORLD

THE BENEFITS of price containment mechanisms in cap-and-trade systems have been discussed in the policy literature for several decades. They can make systems more robust against unexpected outturns, for example when costs of abatement or levels of economic activity are very different from those which were expected when the cap was set. Consequently, they can give more stable signals for investors. And they can, with the right design, produce clear environmental benefits.

Although these benefits have long been understood in principle, there has been little hard evidence to date of how price containment works in practice. This situation has now changed as practical understanding of price containment has been gained from experience around the world.

THE WESTERN CLIMATE INITIATIVE

The most fully developed price containment mechanisms have been introduced in California and the other Western Climate Initiative markets, Quebec and now Ontario. In these systems a price floor is set by specifying a reserve price for allowance auctions. If bids stay below the reserve the allowances are not sold. In an emissions trading system a reserve price gives a "soft" floor. The market price of allowances can go below the auction reserve price, but eventually the need to buy allowances at auction is likely to ensure that the price is at or above the floor, provided there Is confidence that the system will continue.

Chart 1 (right) shows how this has worked in practice in California since shortly after the system began operation. The auction reserve price started at $10/tonne in 2012 and since then has been increased each year by 5% plus inflation. The market price has generally stayed above this level. However, it did dip below the reserve price for a while in 2016, showing that the floor is indeed "soft". This dip reflected a combination of legal challenges to the existence of the system and political uncertainty about its continuation after 2020, reducing the demand for allowances. Once those uncertainties were resolved the price recovered.

However, while prices have been higher than they likely would have been in the absence of the reserve price, and higher than the price in the EU ETS over this period, the price has still been lower than it really should. A range of indicators, including surveys, modelling and estimates of the social cost of carbon indicate the need for prices to rise to around $40/t[1] to be fully effective. It will still take many years at current rates of escalation for the floor to reach such levels.

The California system, in common with the other WCI systems, also has a Price Containment Reserve with successive tranches of allowances being released at prices which started at $40, $45 and $50/t CO_2 in 2013 and, like the floor, increase at 5% plus inflation each year. However, these allowances have not been released from the reserve as the price has stayed well below these levels.

At present the ceilings under the WCI systems are hard, that is, if the reserve is exhausted prices can continue to rise. However from 2020 a further ceiling will be introduced that allows supply to be expanded if prices rise above a threshold, most probably by use of offsets. If the trigger price is set high enough, for example at around $100/t, and the additional supply consists of good quality offsets then this may provide for an appropriate stabilising mechanism. However, with a low trigger price or lower quality offsets the environmental integrity of the system could be compromised.

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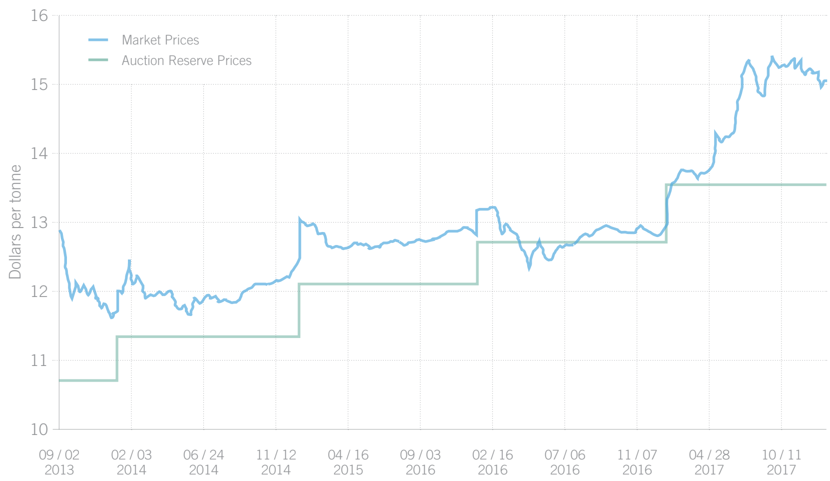
The environmental effectiveness of price containment mechanisms depends in large part on what eventually happens to any unsold allowances. If unsold allowances, such as those in the California Price Containment Reserve, are cancelled or otherwise put beyond use, cumulative emissions will be lower.

CHART 1:

Auction reserve prices and market allowance prices in the California cap-and-trade system

SOURCE: HTTP://CALCARBONDASH.ORG/ AND CARB



However, if they eventually find their way back into the system, and enable the corresponding quantity of emissions to take place, the environmental benefit may not be realised, or at least not in full. Some sort of cancellation mechanism is needed, for example retiring allowances that have been in the reserve for more than a specified number of years.

The combined effect of the price floors and ceilings is to introduce a stepped supply curve. This is shown for California in Chart 2. A tranche of allowances is allocated free of charge. The next tranche is available at the auction reserve price. Further allowances are available as the price increases to levels at which allowances are released from the reserve. This more closely resembles a normal market than would either a pure ETS, which has completely fixed supply, or a pure tax, which has a price that is constant irrespective of supply (illustrative supply curves for these are shown on the chart).

OTHER SYSTEMS

The Regional Greenhouse Gas Initiative (RGGI) has similar arrangements to establish both a price floor and ceiling. However, these are set at very low levels, with a reserve price of under \$3/tCO2 and a price containment reserve trigger of \$10/short ton in 2017. The price went above the price containment reserve level in 2014, triggering the release of allowances from the reserve. A further reserve at an intermediate price is planned after 2020, creating a more “stepped” supply curve.

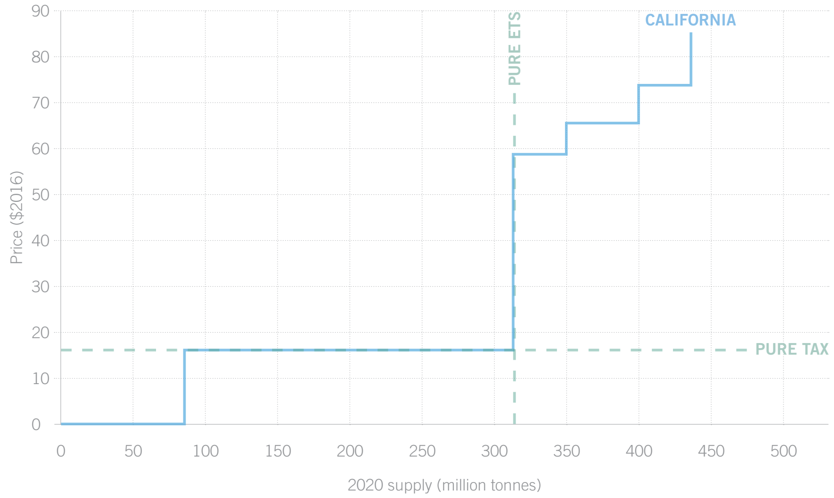
Other systems have some form of partial price containment. The Alberta Specified Gas Emitters Regulation (SGER), which ran for approximately ten years until the start of this year, imposed a hard ceiling by allowing emitters to pay into a fund at a specified price rather than surrender allowances.

Price containment mechanisms have also featured in the Korean ETS. However, these have been quite different from those in North American systems, reflecting the Korean system’s low liquidity, the major role played by state-owned emitters and concerns about rising allowance prices. In 2016 market stability measures were implemented to allow an additional nine million allowances to be made available from a reserve, for auction at a reserve price of 16,200KRW/t (\$15/t), though less than a third were sold. The amount of borrowing within a phase has also been increased from 10% to 20%. Additional foreign credits are now allowed in the system, in the form of CDM offsets, but these will likely be largely owned and already developed by Korean utilities and so are unlikely in practice to result in further emissions reductions.

THE UK EXPERIENCE

The UK offers an example of a different approach, with a tax being used to set the floor price. The carbon price for fuels used in power generation in the UK consists of two components. The first is the price of allowances (EUAs) under the EUETS.

CHART 2:
Supply curve for the California ETS in 2020



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The second is the UK's own carbon tax for the power sector, known as Carbon Price Support (CPS). Chart 3 shows how the level of CPS increased over the period 2013 to 2017[2]. These increases led to a total price - that is the CPS plus the price of EUAs under the EUETS - increasing, despite the price of EUAs remaining weak. The price floor is set by the level of the tax, as this would remain even if the EUA price fell to zero.

This increase has had a dramatic effect on emissions from coal plant, which have reduced by about 90%, over 100 million tonnes p.a., over the period (black line on chart). Various factors contributed to this reduction, including the planned closure of some plants and the effects of regulation of other pollutants. Nevertheless, the increase in the carbon price since 2014 has played a crucial role. Analysis has shown the increase in the carbon price accounted for three quarters of the total reduction in emissions due to generation from coal achieved by 2016[3]. This has been achieved by a price which remains moderate, for example below the $40/t level indicated as necessary for full effectiveness.

The net fall in emissions over the period (shown as the dashed blue line on chart) was around 70 million tonnes p.a.[4], which is smaller than the reduction in emissions from coal. This is because generation from coal was largely displaced by generation from gas. The attribution of three quarters of this net total of 70 million tonnes as being due to the CPS implies around 50 million tonnes p.a. of net emission reductions due to the carbon price. This is equivalent to a reduction of more than 10% of total UK GHGs. The UK tax has thus proved highly effective in reducing emissions. This in turn has produced a substantial environmental benefit as the allowances freed up in the EUETS increase the surplus, so will be transferred to the Market Stability Reserve and eventually cancelled[5].

The original version of Carbon Price Support had a somewhat different approach in that it was intended to "top" up the EUETS price to provide a constant floor. However, a two-year lag was introduced which proved inadequate to dealing with the volatility of the EUETS price. A more effective approach would have been the original design conception, which was to allow the cost of purchasing EUAs at market prices to be offset against the tax bill. However the current system of a fixed tax is now working well.

So carbon pricing structures matter, and so do price levels. Get both right, and a cap and trade system with price containment can make a major contribution to cost-effective decarbonisation

CONCLUSIONS

Based on these varying experiences from around the world we can draw several conclusions.

First, price floors can and do work, as they do in the WCI. However, experience in California shows that political and regulatory stability are also necessary for a system to work well.

Second, the UK not only confirms price floors can work, but shows that with the right price level and the right circumstances a price floor can be spectacularly successful in securing large, low cost emissions reductions very quickly. Indeed, this experience demonstrates the value and effectiveness of carbon pricing more broadly.

Third, rules for what happens to unsold allowances are critical to the environmental effectiveness of a system. Only if allowances are eventually cancelled are the benefits likely to be realised in full. The cancellation of allowances from the Market Stability Reserve, which is included in the recent reforms to the EUETS, sets a valuable precedent in this respect. What happens to allowances in the Price Containment Reserve in California will prove important in securing the full benefits of the approach.

Finally, few if any significant adverse consequences have yet emerged from price containment.

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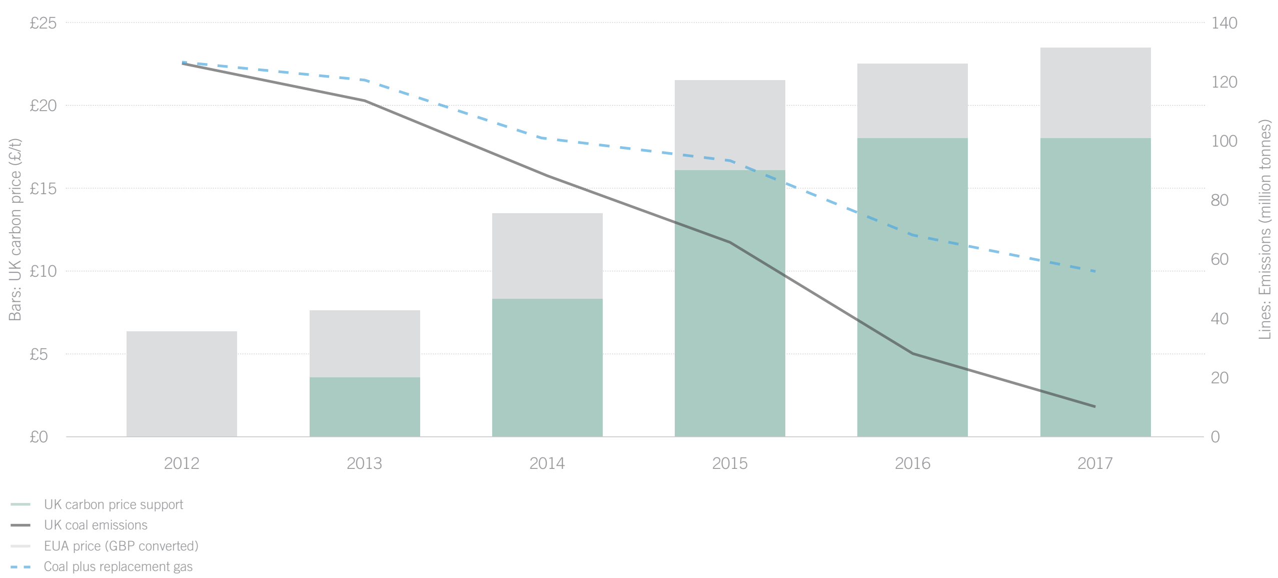
CARBON PRICES AND EMISSIONS IN THE UK POWER SECTOR



(1) The reference to the Social Cost of Carbon are to US EPA 2015 estimates. See World Bank State and Trends in Carbon Pricing report page 11 and sources therein for survey and modelling outcomes. **(2)** UK carbon price support reached at £18/tCO2 (€20/tCO2) in the fiscal year 2015/6 and was retained at this level in 2016/7. In 2013/4 and 2014/5 levels were £4.94 and £9.55 respectively. This reflected defined escalation rates and lags in incorporating changes in EUA prices. Emissions data for 2017 is provisional. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/293849/TIIN_6002_7047_carbon_price_floor_and_other_technical_amendments.pdf and www.parliament.uk/briefing-papers/sn05927.pdf **(3)** https://www.edie.net/news/6/Higher-carbon-price-needed-to-phase-out-UK-coal-generation-by-2025/ **(4)** Based on UK coal generation estimated weighted average emissions intensity of 880gCO2/kWh, and 350gCO2/kWh for gas generation. **(5)** There is a standard objection to a floor in one country under the EUETS is that it does not change of the overall cap at an EU level so, it is said, does not decrease emissions. However this does not hold under the present conditions of the EUETS, and is unlikely to do so in any case. A review of how emissions reductions from national measures, such as the UK carbon price floor, do in fact reduce total cumulative emissions over time is provided was provided in my recent post here.