The Global Carbon Market In 2020

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Introduction

How big will the carbon market be in the year 2020? That is, what will be the volume of transactions under mandatory trading schemes, where greenhouse gas (GHG) emission allowances or credits change hands?

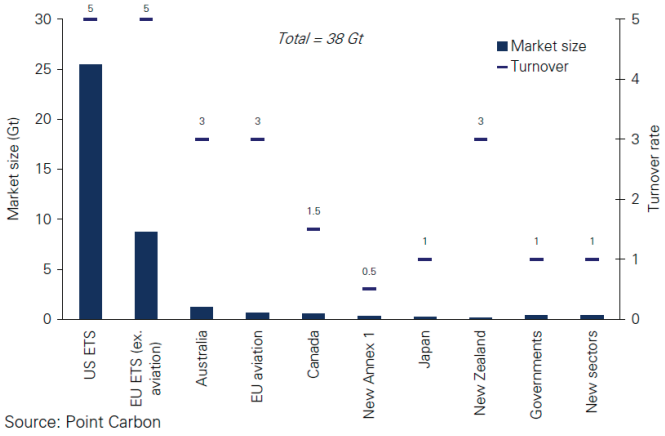
Having a concept of the future size of the carbon market is important for at least two reasons. First, market volume says something about the number, size and kind of participants that a market can accommodate. A bigger market means more, larger and more diverse players. Importantly, a large market involves not only compliance buyers and sellers but also financial players, who will provide liquidity to the market.

Second, an indication of 2020 market size will say something about the place we think emissions trading will have in a future climate structure – not immediately after the end of the first Kyoto commitment period, but well into the post-2012 regime. This is important for long-term investors in sectors exposed to a carbon price.

The model

We calculate the size of the carbon market in 2020, the transacted volume, as the total underlying carbon assets in 2020 multiplied by the turnover rate in each scheme that year (see Figure 1). Underlying carbon assets are the sum of carbon allowances (permits to emit a certain amount of GHGs under a cap-and-trade scheme, ie. the cap) and carbon credits (certificates issued from the reduction of GHG emissions outside a cap-and-trade scheme). We base our estimates primarily on current plans for domestic emissions trading schemes.

Figure 1



Source: Point Carbon

In our methodology, we therefore include the credit limit, or estimated credit import, as a measure of an increased cap in the various schemes, assuming that the available supply of project credits will meet the credit demand from the ETSs. Thus, in our demand-based approach, project credits are counted on equal footing with ETS allowances.

For the same reason, we only count offsets originating outside any ETS worldwide. For example, an import of 1m EU emission Allowances (EUAs) to the US ETS would reduce EU ETS supply by the same amount, but with no effects on the total underlying carbon assets in either the EU ETS or the US ETS. The volume of transactions between linked markets will be subsumed under the general turnover estimates.

The turnover rate denotes the average number of times a given carbon asset trades in a given period (typically a year). For example, in 2007, turnover in the EU ETS was roughly 0.78, which means that a volume of EUAs corresponding to 78% of the EU ETS cap in 2007 changed hands. We distinguish between primary and secondary markets.

Primary markets encompass transactions such as CDM emission reduction purchase agreements (ERPAs) and EUA auctions, which by definition have a turnover rate of one. Conversely, the volume of secondary trades, where the seller is not the original owner (or issuer) of the carbon asset, could have turnover rates of anything from zero to multiple times the underlying assets.

Underlying carbon assets

Our calculations are based on a number of assumptions including a main scenario, which models emissions trading schemes in the US, EU, Australia, Japan, Canada and the remainder of the OECD including Mexico, South Korea and Turkey.

For the US, the model assumes a cap-and-trade scheme along the lines of the first Lieberman-Warner bill. The caps are set to reduce GHG emissions to 2005 levels by 2012, 1990 levels by 2020 and by around 70% below 2005 levels by 2050. This corresponds to a reduction of 15% below a 2005 baseline by 2020. Our modelled US ETS covers a greater share of domestic emissions than the EU, with 4.4bn allowances to be allocated in 2020. Among the sectors covered here, but not under the EU ETS, transportation is the largest.

In January 2008, the European Commission published its proposal for Phase 3 of the EU ETS, which will run from 2013 to the end of 2020. The proposal calls for a default reduction of GHG emissions in the EU by 20% under 1990 levels in 2020. In case of a "satisfactory" international agreement, the EU will take on a reduction target of up to 30% under 1990 levels. In our main scenario, we will take the average of these two extremes – a 25% reduction under 1990 emissions, which implies a 2020 allocation of around 1.5bn EUAs.

In addition to this, the aviation cap under the current EC proposal is set at 225 Mt for the 20% scenario and 198 Mt for a 30% reduction. This would give an aviation cap of 212m aviation EUAs if a 25% reduction target is chosen. In addition, we estimate an aviation credit limit of about 7 Mt. The total underlying asset, including aviation and credits, would thus be almost 2bn EUAs in 2020.

Coverage in the Australian ETS is assumed to be 84% of the country's 2020 emissions. Under our 25% reduction scenario, this would give a cap of 336 Mt in 2020. Full auctioning should be the rule – although trade-exposed sectors might receive free allowances as "transitional" assistance.

Also included in our model are trading for international marine and aviation emissions and a continuation of government procurement of carbon credits in the EU and Japan.

Where no other plans have been published, we assume that current Annex I countries will take on 25% reduction targets compared to either 1990 or 2005 baseline emissions.

In summary, the total underlying asset in the global carbon markets is expected to be around 9.4 Gt in 2020. In comparison, the underlying asset in 2007 was around 2.5 Gt. The federal emissions trading scheme in the US is expected to be by far the largest system in the world, containing 54% of the total underlying assets. The EU ETS is second with around 19 percent. Combined, these two markets therefore cover almost three-quarters of the total underlying assets.

Market turnover

How many times will the world's carbon assets trade in 2020? In general, the turnover is determined by a variety of factors, for instance the tightness (scarcity) in the system, the depth (volume) in the bid/offer spread and the volatility in the market.

As the carbon markets are young – and in some cases have not even been established yet – we look into other more mature commodity markets in order to get guidance on what to expect in the carbon markets in terms of volume of transactions.

We look at the crude oil, Nordic power and continental European power markets for guidance on what turnover rates are reasonable.

In our main scenario, we see the US ETS and EU ETS as large and diverse. They will have considerable shortfalls, while operating in countries with active power and commodity markets.

We assume that turnover in these schemes in 2020 will not be much lower than the levels seen in the crude oil and Nordic power markets in recent years. Other schemes and purchasing programmes are assigned lower turnover rates. Based on these assumptions, we calculate an average

turnover rate in the world carbon market of about four times underlying assets by 2020.

Hence, financial institutions will primarily look at the US and Europe when seeking to trade carbon.

Market size

Adding the products of the underlying assets and turnover in each market segment yields a market size in 2020 of 38 Gt CO_2e (equivalent carbon dioxide), as shown in Figure 1. This corresponds to just over half the volume of projected BAU emissions in 2020. In comparison, this is 14 times the traded volume in 2007. With an overall underlying asset of 9.4 Gt, and a market size of 38 Gt CO_2e, the average turnover rate in the global carbon market in 2020 would thus be roughly four.

According to our model, the US dominates the world carbon market with around 25 Gt transacted in 2020, constituting 67% of the total. The EU ETS follows with 9 Gt and 23% of the total global market. The other markets and sectors consequently have a minor impact on the traded volumes. Hence, financial institutions will most probably look the US and/or Europe.

Market value

What would be the value of the world's carbon market under our scenario? At today's secondary CER price, the market in 2020 would be worth €670bn. While we do not forecast value, a carbon price of $50 would yield a market value of almost $2 trillion in 2020.

Will it happen? Looking at US and EU plans and policy statements, it is not unlikely that the two would link their carbon trading schemes in the next decade, creating a very large GHG cap-and-trade scheme. Such a joint scheme would combine all the attributes that would make it attractive to financial players and produce a high turnover rate: size and diversity, parallel commodity markets, allowance scarcity and auctioning.

With a US-EU engine established as a core, the global carbon market might rival some of the established commodity markets in the world. This implies that the EU ETS and US ETS, linked, could be an unstoppable force almost independently of any global climate framework. ■