

Carbon Bloating

The unintended consequences of giving away free permits to big polluters

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Introduction

The Gillard Government recently passed legislation which will, for the first time in Australia, see big polluters pay for their greenhouse gas emissions through a price on carbon. While the introduction of a carbon price will not in itself drive a substantial reduction in Australia's emissions, it does begin to build the necessary policy infrastructure to achieve larger reductions in the future. The legislation sets out how the carbon price will work as well as the detail of the compensation program that will be given to the biggest polluting firms. The compensation to these firms is called the Jobs and Competitiveness Program.

While the legislation has now passed, the regulations that set out some of the important detail of the compensation program have yet to be finalised. The regulations will include such matters as the assistance rates paid to emissions-intensive trade-exposed (EITE) industries.

The Jobs and Competitiveness Program

The Jobs and Competitiveness Program will give away around 40 per cent of the revenue raised by the carbon price to industry. Around \$9.2 billion will be provided in the form of free carbon permits, primarily to companies in manufacturing and heavy industry that are emissions-intensive and trade-exposed. The rationale for such assistance is provided to prevent so-called 'carbon leakage': the possible relocation of firms in the EITE sector from Australia to other countries that do not have a comparable carbon constraint. Such leakage, it is thought, would not reduce global emissions, but rather transfer them from Australia to other countries. At the same time, it would have negative economic consequences for Australia, including the loss of domestic jobs.

The Jobs and Competitiveness Program seeks to avoid carbon leakage by granting free pollution permits to the most emissions-intensive and trade-exposed activities. Those activities that are assessed to be 'highly' emissions-intensive will, according to proposed regulations, receive 94.5 per cent of their pollution permits for free. Those activities that are assessed to be 'moderately' emissions intensive will receive 66 per cent of their pollution permits for free.

The process of assessing the emissions intensity of an activity is based on historical information about emissions, production and revenue over a four year period from 2004/05 to 2007/08, which is known as the baseline period. The significance of this period is that it creates a benchmark which is effectively the average emissions intensity of all firms involved in a particular economic activity in Australia over the four baseline years. This benchmark is used to calculate the amount of emissions created for every unit of output. For example the benchmark for aluminium smelting is 17 tonnes of CO₂e for every tonne of aluminium produced.¹

If an aluminium producer has the same emissions intensity as the average producer in the baseline period they can expect in the first year of the carbon price to receive approximately 16 free permits (i.e. 17 x 94.5%) for every tonne of aluminium they produce. While all aluminium producers will be assessed as having the same baseline of 17 tonnes of CO₂e for every tonne of aluminium produced, not all aluminium producers actually generate that amount of emissions, because the benchmark is the historical average for all aluminium smelters within Australia. Actual emissions for each smelter will vary from the historical average due to such factors as the efficiency of the smelter and the age and type of equipment used. Smelters may have also introduced processes and equipment that have reduced their emissions since 2008.

¹ Department of Climate Change and Energy Efficiency (2011) p32

While the smelter pays the carbon price based on its actual emissions, the quantity of free permits it receives is based on the benchmark (i.e. 17 tonnes of CO₂e for every tonne of aluminium produced). If a firm conducting an EITE activity can significantly reduce its emissions, it may actually receive more free permits than the corresponding amount of greenhouse gases it emits. As a result, some firms may make windfall gains from the assistance they receive.

Consider the following example. Suppose an aluminium smelter's emissions intensity in the baseline period is 15.5 tonnes of CO₂e for every tonne of aluminium produced – that is, more efficient than the industry average. This firm then undertakes to reduce its emissions by changing its production process and modernising its plant and equipment. This results in a reduction in its emissions by three per cent. So now it produces 15 tonnes of CO₂e for every tonne of aluminium produced. The firm receives 16 permits for each tonne (94.5 per cent of the industry baseline of 17 tonnes) but only has to acquit 15 permits for each tonne. The firm therefore will receive one spare free permit for each tonne of aluminium produced – a spare permit it is free to sell to others on the open market.

A maximum cap on emissions

Under the Rudd Government's earlier proposal to put a price on carbon, known as the Carbon Pollution Reduction Scheme (CPRS), the Government decided that firms should not benefit from windfall gains as a result of EITE assistance by placing a maximum cap on assistance. This meant that a firm could not receive more free permits than it had a liability for. The new carbon price scheme has removed this provision for a maximum cap, but only for existing firms. Other firms that commence an emissions-intensive activity in Australia will be subject to a maximum cap.

The Productivity Commission has been given the task of reviewing the effectiveness of the Jobs and Competitiveness Program, and will examine whether windfall gains are being made by those undertaking EITE activities. This review is, however, not due to take place until 2015 and any subsequent changes that would negatively affect an EITE firm cannot take effect for another three years. This means that changes to prevent windfall gains cannot be made for five years after the commencement of the scheme.

There is in fact an economic case for the Government's decision to remove the maximum cap. The purpose of calculating assistance on a historical benchmark is so that firms receiving assistance have an incentive to lower their emissions. Levels of assistance remains the same regardless of whether a firm's emissions rise or fall, so all the economic benefits of lower emissions flow to the firm, which would need to buy fewer carbon permits than it otherwise would. If assistance were based on the firm's actual emissions over time, then if it were to decrease its emissions the amount of assistance it received would also decline. Put simply, there are greater incentives for EITE industries to reduce their emissions when a historical benchmark rather than actual emissions determine the assistance they receive.

The maximum cap would have meant that firms had no incentive to reduce emissions once their emissions reductions caused them to reach the maximum cap. This would have blunted the price signal that the carbon price is designed to send.

While the argument against a maximum cap makes sense from this perspective, it should be noted that it is only the very high rate of assistance that makes a maximum cap necessary in the first place. Because some firms will receive 94.5 per cent of permits for free, small reductions in emissions can lead to them receiving more than 100 per cent of the permits they need free of charge. It is hard to find an economist or economic analysis that supports the need for an assistance rate of 94.5 per cent. Professor Garnaut in his Climate Change

Review², the Government's Green Paper³ and most recently a report by the Grattan Institute⁴ have all argued that this degree of industry assistance is excessive or has proposed lower levels of assistance. Lowering the assistance rate would be a far more effective way to ensure the integrity of the price signal than removing the maximum cap. If assistance rates started at a flat 60 per cent rate then the vast majority of activities would be unable to receive assistance greater than their liability. Such a change can occur by altering the regulations.

The case of ammonium nitrate

Ammonium nitrate production is a good example of how an industry could potentially benefit from windfall gains because of the lack of a maximum cap. Ammonium nitrate is used mainly as a fertiliser and can also be used in the manufacture of explosives. It is produced in a two stage process by first creating nitric acid from ammonia, and then reacting the nitric acid with more ammonia to produce ammonium nitrate solution. This solution can then be processed further into prills, which are small beads. It can be sold in prill form or alternatively the solution can be used to make ammonium nitrate emulsion which is used in the manufacture of explosives. In Australia, ammonium nitrate is produced by Orica, CSBP and Queensland Nitrates (a joint venture of CSBP and Incitec Pivot).

In order for an industry to receive assistance the Department of Climate Change and Energy Efficiency (DCCEE) has to first define the emissions intensive process as an activity and then assess if it is highly emissions intensive, moderately emissions intensive or not emissions intensive. The activity of ammonium nitrate production from ammonia is likely to be assessed at the highly emission intensive level, which would mean that producers would be eligible to receive 94.5 per cent of their emissions permits for free in the first year. Ammonium nitrate production in Australia is co-located with facilities that produce ammonia since ammonia is the essential precursor chemical. The production of ammonia is also a defined activity by DCCEE and is also likely to be assessed at the highly emissions-intensive level. Because Ammonia is its own activity the emissions associated with ammonia are captured in the Ammonia activity and not in the ammonium nitrate activity.

The major source of emissions from the production of ammonium nitrate is in the first stage of the process: the production of nitric acid. These emissions are different from most other emissions-intensive activities, since they come primarily from nitrous oxide. Nitrous oxide is a greenhouse gas which is 310 times more potent than carbon dioxide, and about 85 per cent of ammonium nitrate emissions come from nitrous oxide. The other interesting thing about nitrous oxide emissions is that they can be abated at a relatively low cost. By installing a catalytic process in the waste gas stream up to 80 per cent of the nitrous oxide emissions can be destroyed. Technology to achieve this has been developed internationally over the past decade, in response to the recognition of the contribution of nitrous oxide to greenhouse gas emissions. This abatement technology is relatively cheap, can be retro-fitted to existing facilities and is used in a number of ammonium nitrate facilities overseas. However, it is not currently used at any Australia facilities.

Such a technology has important implications for the production of ammonium nitrate in Australia. Since, as explained above, emissions are benchmarked from the baseline years of 2004/05 to 2007/08, technology that could substantially reduce their emissions in the future is not accounted for in the benchmark. After installing nitrous oxide abatement technology, ammonium nitrate producers will be paid assistance based on their past emissions. They are likely therefore to make considerable windfall gains.

² Garnaut, R (2008) Chapter 14

³ Australian Commonwealth Government (2008) Chapter 9

⁴ Wood et al (2011)

In 2009, Dampier Nitrogen Pty Ltd proposed to develop an ammonium nitrate facility in Western Australia and commissioned a consulting firm, GHD, to provide a report on the Greenhouse Gas emissions⁵ that would be expected from the new plant as part of the requirements for environmental approval from the Western Australian government. From the figures provided in GHD's report we have estimated the emissions intensity of ammonium nitrate production. It should be noted that because this is a new facility the emissions intensity is expected to be lower than the existing facilities within Australia. We therefore believe that the figures presented below are an under-estimate of the emissions intensity of existing Australian facilities.

In the calculations we have also excluded the emissions associated with the ammonia plant since these emissions will be subject to assistance under the separate production of Ammonia activity. We have also included all emissions at the site associated with ammonium nitrate production.

According to our calculations the production of one tonne of ammonium nitrate will produce 2.7 tonnes of CO₂e using the technology that was used in Australia in the baseline period. Of these emissions 85 per cent come from nitrous oxide. The remaining emissions come mainly from scope 2 electricity emissions (11 per cent). The remainder is other scope 1 emissions.

If the nitrous oxide abatement technology discussed above is introduced, the nitrous oxide emissions according to the GHD report, will likely fall by 80 per cent and the emissions intensity will decrease to 0.9 tonnes of CO₂e per tonne of ammonium nitrate. This is one of the emission intensities we assume will be in place after the industry installs the nitrous oxide abatement technology. The industry will be paid assistance based on 2.7 tonnes of CO₂e per tonne of ammonium nitrate, but they will only be emitting 0.9 tonnes of CO₂e per tonne of ammonium nitrate.

In the first year of the carbon price scheme, each permit will cost \$23 and the producers of ammonium nitrate will receive 94.5 per cent of their permits for free. If the baseline is 2.7 tonnes of CO₂e per tonne of ammonium nitrate then the producers of ammonium nitrate will receive \$58.70 (2.7 * 0.945 * \$23) worth of free permits for every tonne of ammonium nitrate they produce. At the same time they will have a liability of \$20.70 (0.9 * \$23) for every tonne of ammonium nitrate they produce. This means they will gain \$38 in windfall gains for each tonne of ammonium nitrate they produce.

The current capacity of Australia's ammonium nitrate production is approximately 1.7 million tonnes per year.⁶ If we assume that the facilities are running on average at 75 per cent capacity then we can expect 1.3 million tonnes of ammonium nitrate to be produced in Australia. That means that the ammonium nitrate industry will make approximately \$50 million in windfall gains in the first year. It should be noted that the carbon price in the first three years will rise faster than assistance rates will fall, so the size of the windfall gains the ammonium nitrate industry could earn could be expected to increase.

Orica produced a report⁷ in November 2010 for its Kooragang Island facility which it is planning to expand from 430,000 tonnes of ammonium nitrate to 750,000 tonnes per annum. During the upgrade Orica is planning to retrofit the whole site with nitrous oxide abatement technology. They claim in the report that this will reduce nitrous oxide emissions by 65 per cent. If we use the 65 per cent reduction figure instead of 80 per cent then emissions intensity of ammonium nitrate production after the introduction of the abatement technology is 1.2 tonnes of CO₂e per tonne of ammonium nitrate. While the amount of assistance

⁵ GHD (2009)

⁶ Queensland Nitrates Moura facility – 180,000 tonnes. CSBP Kwinana facility – 520,000 tonnes. Orica Kooragang Island facility 430,000 tonnes. Orica Yarwun facility 580,000 tonnes.

⁷ Orica (2010)

remains the same at \$58.70 worth of free permits for every tonne of ammonium nitrate they produce, the liability increases to \$27.60 ($1.2 * \23) for every tonne of ammonium nitrate they produce. This means the windfall gain is now \$31.10 per tonne of ammonium nitrate produced.

The large expansion of Orica's Kooragang Island facility does show the potential that existing facilities in Australia have to expand their output. The impacts of this need to be carefully considered in a situation where there is not maximum cap.

Possible impacts on the ammonium nitrate industry with no maximum cap

The Jobs and Competitiveness program is designed to prevent carbon leakage, but in the case of the ammonium nitrate industry it may result in precisely the opposite: what might be termed 'carbon bloating'. The provision of more than 100 per cent of the permits required by some industries may encourage additional EITE production to come to Australia at the expense of production overseas. With the government paying a subsidy of between \$38 and \$31.10 for every tonne of ammonium nitrate produced in Australia, firms may be tempted to increase production in Australia. While new firms, and existing firms building new facilities, are subject to a maximum cap and can't reap the same windfall gains, the proposed regulations do not prevent the three existing firms from expanding their current facilities or increasing their output, as shown in the Kooragang Island example above. If this occurs then we will see taxpayers' money in ever growing amounts funnelled into the profits of ammonium nitrate producers as production shifts from overseas facilities to Australian facilities.

Granting an effective subsidy to ammonium nitrate producers may also have implications for agreements Australia has made under the World Trade Organisation.

How to fix the problem

While the Clean Energy Act has passed, the regulations, which set out some important details like assistance rates, can still be modified. This makes some solutions easier to implement than others.

One of the simplest ways to fix the problem would be to extend the maximum cap provisions to existing firms, as was the case under the CPRS. With such a restriction, firms would be unable to receive more free permits than they had a liability for. From a legislative stand point this would be relatively easy to implement.

The disadvantage of this approach is that it would blunt the price signal for some industries and firms that find it relatively easy to reduce their emissions. Once they had reduced their emissions to the point that the maximum cap is reached, there would be no incentive to reduce emissions further. Another disadvantage is that now the legislation has passed it would require the passing of an amendment to make this change.

The underlying problem is caused in the main by the very high rates of assistance. With assistance rates set as high as 94.5 per cent on the industry average, it is relatively easy for large polluting firms to reduce their emissions to the extent that they can make windfall gains on the assistance program. A more economically sensible solution would be to lower the assistance rates.

Another, more comprehensive solution would be to shorten and tighten the assistance review provisions. How firms will react to the carbon price will not be known until after it has been implemented. Locking in high rates of assistance for an extended period of time (presently five years) without a good understanding of the capacity of different industries to lower

emissions seems misguided. A review after only two years (rather than three) and the ability to cut assistance rates immediately rather than having to wait a further three years would allow the Government an opportunity to fine-tune the assistance program. If firms have not been able to reduce their emissions then assistance rates could remain at the same level. If however industries have managed to make a net financial gain from the introduction of a carbon price then assistance rates could be cut.

Conclusions

The extremely generous provisions of the Jobs and Competitiveness Program create the potential for highly polluting firms to receive windfall gains. This has an opportunity cost, since every dollar spent by taxpayers increasing corporate profits is a dollar not spent on household assistance or other climate change policies.

In the case of ammonium nitrate the windfall gains may be sufficiently large to encourage an expansion of domestic production. Such an expansion would see larger amounts of tax income funnelled to producers of ammonium nitrate and may even be in breach of Australia's international obligations under the World Trade Organisation.

While this paper has highlighted the example of ammonium nitrate, there may be other industries which can find similar windfall gains. Industries may not be forthcoming with information about the extent of their emission reduction options, particularly when reductions in emissions may confer a financial windfall. An important question to consider is how many other polluting industries will be able to reduce their emissions to the extent that they will be more profitable with a carbon price than without it. The legislation and its regulations should have the flexibility to deal with such contingencies when they arise.

Any assistance program should be targeted to stop firms from moving offshore while retaining an incentive for them to reduce their emissions. Overly generous assistance simply reduces the funds available for household assistance and other climate change projects. Unfortunately, the Jobs and Competitiveness Program in its current form is sufficiently generous that windfall gains are likely – an outcome that is neither good policy nor common sense.

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