Advanced Financial Instruments for Sustainable Business and Decentralized Markets

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In a series of next few videos, we will discuss the allowance allocation approaches starting with the introduction from this video. There are two fundamental approaches to allowance allocation. Either the government can give the allowances away for free through free allocation or it can sell the allowances at auction. So, either it can sell the allowances at auction, or it can give for free. Free allocation provides some proportion of emissions for free which includes the approach called grandfathering or benchmark allocation approach. We will discuss these approaches in more detail in subsequent discussions.

Allocation of allowances

- *Methods of allocation*

1. Free allocation
- 1.1 Free allocation using grandfathering approach
- 1.2 Free allocation using benchmark approach

2. Selling allowances in an auction
- Free allocation is typically provided either based on historical emissions (grandfathering) or on efficiency benchmarks (benchmarking)

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Whereas auctioning involves the location of allowances through a competitive bidding process. This competitive bidding process allows for price discovery and strong incentives for carbon abatement. It also creates a source of revenue that can be distributed to a wide range of potential beneficiaries. In fact, during phases 1 and 2, most of the allowances in all member states were given out for free based on the historical greenhouse gas emissions.

Allocation of allowances: *Grandfathering*

- Free allocation (grandfathering) = applicable historical emissions x adjustment factors
- Free allocation via grandfathering uses historical emissions to determine the allocation.
- Companies receive free allowances based on their historical emissions from a specified period
- Grandfathering has the advantage of being relatively simple with moderate data requirements
- However, it may reduce the need to trade in early years and can penalize companies that invest in emission reductions early on, as these reductions may effectively lower their 'historical emissions baseline' and cause them to receive fewer permits

This was known as grandfathering approach based on the historical emissions. This approach has been often criticized as rewarding high emitters. This was criticized as having rewarded high emitters and it does not take early action by installations to decrease emissions into account. So, those installations who did not take early actions and kept their emissions high, still benefited because of this approach. In contrast to this grandfathering approach, another approach is benchmarking.

In the benchmarking approach, it does not have the effect of providing more free allocation to the highest emitting installations. In fact, benchmarking allocates allowances based on the production performance instead of their historical emissions. So unlike the greenhouse gas intensive installations, which will receive less free allowances in this benchmarking approach as compared to the production level, so an installation that is less efficient, it will receive less allocations in the benchmarking approach as compared to their production level compared to the production with highly efficient installations. So, in the benchmarking approach, you are motivated to increase your efficiency. If you are inefficient, you are producing more emissions, but your output is less, you will receive less installations and that will drive efficient installation to succeed.

That means it will drive the inefficient installations to become more efficient and reduce their emissions by moving towards more efficient technologies. So that way it improves efficiency and motivates those installations that are doing well, producing efficiently. And that is the reason why in phase 3 onwards, this benchmarking was chosen as a default method, a major method to allocate options for free, allowances for free. So a sizable allowances in phase 3, while the benchmark was the method to allocate allowances for free, but a sizable allowances were given through auction method. In phase 3, a sizable

allowances were given through auction method, although free allocations were still given mainly to the industry sector and a cap has been set on the maximum free allocation to industry limiting it to approximately 43%.

So free allocation was capped at 43% in the phase 3. And from phase 3 onwards, as we noted benchmarking approach was the approach, the deep approach for free allocation. The total amount of free allocation each installation would receive is determined by the product related greenhouse gas emission benchmarks to the extent feasible. Those benchmarks are set at the average emission level of 10% most efficient installations in each sector. In this case, you will be benchmarked against the 10% more efficient installations in terms of your production process, comparable production processes you will be compared against them and therefore you have to become more efficient.

So these benchmarks are set at the average emission level of the 10% most efficient installation within each sector. In this way, installations that are highly efficient should receive all or almost all of the allowances they need to comply with the EUETS obligations. All-time installations therefore would have to make greater effort to cover their emissions with allowances either by reducing their emissions or purchasing more allowances. To summarize this video, we discussed that in EUETS there are two methods of allowance allocation, one is the free allocation method and second is the auction based allowances method. There are two sub approaches, one is grandfathering and benchmarking for free allocation.

Gradually it was found that benchmarking approach is slightly more efficient and therefore from case 3 onwards when a lot of learning has happened, the free allocation approach was done through benchmarking almost 40% of allowances were allocated through this method. However, gradually it was found that free allocation was reduced and more reliance was on auction method was there from phase 3 onwards. The benefit of this auction method is that there are extra incremental revenues and more competitive price discovery happens. In the next few videos, we will discuss the grandfathering and benchmarking approaches. In this video, we will introduce the grandfathering approach to allowance allocation.

Refer to this formula that is free allocation as per the grandfathering equal to applicable historical emissions into adjustment factors. As the formula suggests, the grandfathering approach employs historical emissions along with certain adjustment factors as we will discuss to compute the amount of free allocation to installations that are covered as per EUETS. As we noted, free allocation via grandfathering introduces or uses historical emissions to determine the location. The historical emissions get multiplied by adjustment factors that are comprised of mostly the carbon leakage assistance rate, we will discuss that

as well as cap decline factor, we will also discuss that. First and foremost, these carbon leakage assistance rates vary from 0% to 100%.

Essentially these assistance rates depend upon emission intensity and carbon leakage risk. What is carbon leakage risk? Carbon leakage risk is the risk of any investment in a plant and facility moving out in a different jurisdiction due to carbon prices. For example, if any such incentive is created because of which a given investment moves out of a jurisdiction maybe because of the CUETS policy or because of that the production has become costlier, then that is called carbon leakage risk. So those investments and plant manufacturing installations that are highly exposed to this kind of carbon leakage risk are provided with higher assistance rates, so on the higher side of it. Also there is cap decline factor.

The cap decline factor ensures that this grandfathering approach remains a transitionary measure. What do we mean by this? So basically, it ensures that free allocation as per the grandfathering declines over time and thus it remains only a transitionary measure, not a long-term permanent solution for a allocation of allowances. And therefore, as per grandfathering companies receive free allowances based on their historical emissions from a specified period. The rate of assistance under grandfathering is determined by historical emissions as we discussed the assistance rate. This means that the amount of allocation received remains independent of future output decisions or decisions to reduce emissions intensity.

So while implementing grandfathering it is critical to set the base year for the data used early on to avoid any incentives for entities to drive up the emissions. In order to increase the allocation so because as per the grandfathering they will be allocated the emissions based on their emissions they will be allocated the allowances so it is very important to clearly set the base year as per which these allowance allocation will be determined at a very early period. So there is no scope for bias or lobbying by firms to maximize their benefits for their facilities in order to get higher number of allowances. And that will also ensure that equitable treatment of facilities for all the plant manufacture installation will be treated in an equitable manner and any kind of potential lobbying by the firms to maximize the free allowances that will be minimized. So in that sense if you look at this grandfathering approach it has that advantage of being relatively simple because of simpler allocating based on historical emissions from a specified period and therefore it has very moderate data requirements.

Moreover it may reduce the need to trade in early years and can also penalize the companies that invest early on in the emission reduction. So for example those farm plant manufacturing installations who would have anticipated this climate change and would have invested early on and with now they have low emissions so when the grandfathering

will start they will get smaller amount lower amount as compared to those installations that have not been very thought through. They have not thought about reducing their emissions and they have higher level of emissions now they will be getting higher fee allowances. So, in that sense it is slightly biased and not very efficient. So in that sense we are saying that it may reduce the need to trade in early years for such installations because they are getting free allowances and therefore it can also penalize those plant manufacturing facilities that have invested early on in order to reduce the emissions.

So as these reductions may effectively lower their historical emission baseline that historical emission baseline which is used to compute the grandfathering approach so because of their lower emissions this historical emission baseline is reduced and therefore those efficient installations will get fewer permits. What installations have invested early on to reduce their emissions so they will get fewer permits. Certainly there are certain advantages with this approach for example grandfathering as we discussed has the advantage of being relatively simple with moderate data requirements and it uses forms historical emissions to calculate fee allocation and therefore it does not require much data so this makes it relatively straightforward approach for alliance allocation and also it makes it a popular method in initial stages. So grandfathering can also be simpler for regulated entities as their fee allocation will be close to their level of emissions and therefore less trading will be required because now their emissions are very close to their the free allocation that they received so not much trading not much buying would be required on their part. Also it can partially compensate for standard assets those plant manufacturing installations that are trying to leave away certain older methods but immediately leaving would penalize them because of that reduced amount that they will have from their standard assets.

So one of transitionary kind of grandfathering approach may be very attractive for such installations because it will provide them the requisite support for their transition from slightly more inefficient in terms of their emission to more efficient and more novel technology adoption otherwise they might lose that significant value from that standard asset that would be written off in a very short span and if they were planning to use that asset in a transitionary phase and therefore they can benefit from this kind of grandfathering approach get some free allocation of allowances and manage that transitionary period and also such firms who are likely to get harmed because of this loss in value of the standard asset they would likely to resist participation in such schemes as EUETS. So if they get these free allowances probably they are more motivated to participate in this because their standard assets are not getting written off very sharply and they are not losing too much in one go. Lastly this approach also maintains your marginal abatement incentive. So what we are calling as marginal abatement incentive that is that means given the current carbon price if the carbon price is high a plant manufacturing

installation should have high motivation for abatement. So, they have higher incentive for abatement.

This approach does not divert that incentive. So the reason is that firms that reduce emissions they can and they have excess allowances they can sell their allowances and they can either sell it right now or bank their surplus allowances sell them in future and if a certain plant manufacturing installation is not very motivated they have high emission they have to pay the cost for that. So, your current motivation your marginal current motivation or abatement incentives they are remaining, and this is one of the features of grandfathering that it is kind of a lump sum financial allocation to firm free allocation. So the amount that firm is receiving is not a function of its current or future output. So it is more of a historical based allocation.

So in the short term firms should respond to carbon price that means if it is high they will be more cautious and try to adopt more technological advancements green and renewable technologies in the same way even if they would not receive the free allowance allocation. So, it is only a transitionary approach it does not reduce or any way deteriorate their marginal abatement incentives. What do we mean by these marginal abatement incentives? We mean their current incentives given the current carbon price whatever their incentives if let us say carbon price is high, they should have the motivation to reduce their emission and go towards more efficient green and renewable technologies. To summarize this video, we discussed the grandfathering approach to allowance allocation. We noted that this approach requires historical data.

So it is a relatively simple approach. However, we also noted that this approach should be used only as a transitionary measure and for free allocation. Although this approach has the advantage that it does not reduce the marginal abatement incentives that is the current incentives of firms to reduce their emissions however it is not so good for those firms that have invested early on such technologies to reduce their emissions much earlier and therefore their historical or levels of emissions have come down and they get lower number of allowances and therefore somehow penalized by this approach.

Challenges with Grandfathering

- During phases 1 and 2, most allowances in all Member States were given out for free based on historical GHG emissions, i.e., grandfathering.
- First, it has been blamed of causing undesired redistributive effects: The general criticism regarded the unfairness of inducing consumers to pay for what producers received for free.
- Grandfathering has been criticized also on an efficiency ground by arguing that it is equivalent to a government subsidy
- This approach has been criticised as rewarding higher emitters while not taking early action into account.

In this video we will discuss certain challenges with the grandfathering approach. Before we come to the challenges and disadvantages with the grandfathering approach please note it should be considered this grandfathering approach because of these disadvantages it should be only considered as a transitionary arrangement while collecting data to implement either benchmarking for free allocation and also to allow capacity building and then the auction approach to take place.

Challenges with Grandfathering

- **Weak impact on leakage risk:** grandparenting does not affect the marginal incentives that firms face under a carbon price, it does not protect against production leakage
- **Penalizing early action** of the early movers if they implement the abatement actions early in time
- **New entrants and closures** new entrants are at disadvantage as they have no historic emissions and also delay the exit decision from the carbon intensive producers

So during phases 1 and 2 most of the allowances in member states were given out for free based on historical greenhouse gas emissions which we are calling as grandfathering. First and foremost, it is blamed for causing undesired redistributive effects. What it means is

that for example many electricity generators could earn windfall profits by passing the final electricity price and also getting the market value of allowances that they initially received for free. What we mean here is that because these electricity producers could increase their prices to their customers, they got that benefit and then they also had those allowances which they received because of that carbon price. So the general criticism was that unfairness of the policy that it induced customers, consumers of electricity to pay because of that increase in electricity prices what producers already received for free in the form of allowances from this grandfathering approach the allowances that were given out for free to the installations.

So in that sense if this grandfathering approach is continued it reduces the incentives to abate if it is continued in the long term and that is why we are saying it should be a transitionary measure. So, while grandfathering should maintain marginal incentives to abate that means the current incentives based on carbon prices those incentives to abate and reduce the emissions are there. This can be significantly diluted if the policy this policy is continued over long time and not as a transitionary measure. So, in such cases future allowance allocation will be based on updated emission levels. This means that firms that make emission reductions maybe by reducing their output or emission intensity will receive lower support in the future and thus significantly decreasing the incentive to abate.

So firms who do not change their technology and keep emitting higher amounts higher emission levels they will keep getting higher allowances for free as per the grandfathering approach and thus there is not much incentive for them to improve. So this is also a major distortion in the carbon price signal and it may lead to less cost effective emission abatement from production and investment decision. So there is no motivation for the firms to decrease their emissions for technology as long as they are getting these allowances for free through this grandfathering approach. It is likely to be addressed only if it is signaled at a very early stage when grandfathering is going on at a very early stage some signal is to be given that in future medium to long term the allocations will not be based on grandfathering and some other approach like benchmarking and as we will discuss the benchmarking approach later as well. But some other approach like auction and benchmarking as a combination will be employed and this approach will not be it is only an early mechanism and this has been in fact done in many systems.

Also this approach has been criticized for the windfall gains to plant manufacturing installations. For example, this grandfathering approach can create windfall profits with different channels. So, these grandfathering firms are incentivized to reduce emissions only to minimize their carbon cost liability. So, firms may be able to invest in low cost abatement that reduces liabilities by much more than the cost of investment and therefore reducing the carbon cost liability. Any investment has no impact on the number of free

allowances it receives.

So even if you invest a lot and you reduce emissions but still as per the grandfathering approach it will not recognize that and you will get in fact you will get lower amount of allowances. So, in this case having a high quantity of really allocated allowances results in a large rise in assets without a comparative increase in cost. So, there are windfall profits to you under grandfathering and maybe highest for the historically high emitters within a sector that have not taken early action. So, those installations who have not taken early action did not recognize the benefits of climate change mitigation and those technologies and they are still maintaining high emissions they get high amount of allowances with this approach. So, these windfall profits under grandfathering may be highest for the historically high emitters in a sector who have not taken early action and they keep getting high rate of free allocation and may still have significantly low abatement opportunities available.

So, even though there may be technological approaches to reduce emissions they may not be motivated to do as long as they are getting high free allowances, high number of free allowances. Also, the additional carbon cost liability changes optimal output decisions. Firm may decrease output for example electricity firm if they understand the sensitivity of demand supply they may decrease the output, increase the price and overall combined with these two approaches not only they are getting the benefit of higher prices of free allowances and also the higher prices of their end product. So, this will prolong the lifetime of higher carbon assets. So, they can continue emitting high because they are not getting peel lies which will further lead to high cost of emission reduction.

So, still they will not reduce. And this was seen for instance for some electricity generators in phases 1 and 2 of the EUETS. So, this was observed, and windfall profits could be a wider issue for the longevity of EUETS'S potentially undermining public confidence in the system as self. Particularly, if they persist for long and installations do not make efforts to reduce their emissions. So, without additional provisions once firm have received their free allocation they could close and sell their allowances and also again get windfall profits. However, some of the revenue generated may cover any standard assets.

So, this is a slightly different issue of standard assets where if firm is shutting its shop they may have to make quick write-offs and losses on those assets that will not be utilized further. So, there these three allocations can provide some support. So, they are not immediately peel lies. And because of this risk when grandfathering is implemented it often requires facilities to maintain operations to some extent. So, even if they are emitting they are given some time to sustain their operations for free allocation and continue to use

those older assets which are not very environment friendly.

So, while that period in the transition period they will get some free allocations even though their emissions are higher. Also the grandfathering approach has been criticized on the efficiency grounds that it is like a government subsidy that creates an artificial kind of and in fact undesirable incentive for existing market participants to not exit the industry and as long as the grandfathering approach passes they can keep operating with older and less efficient plant free. As we said earlier this may be a very fruitful and very productive approach for a transitionary period. So, if they want some support for a transitionary period to say shift to more carbon friendly and more efficient technology. So, as a transitionary measure it may be a good but if it is a long term measure then it can be misused.

And also this approach has been criticized for rewarding higher emitters have not taken early actions into account. So, those emitters who have not taken early actions benefit in fact the approach may benefit them and that is why also it is criticized. Another few important points are that it is weak, it has a weak impact on leakage risk. Leakage risk we will discuss that. So, since grandfathering does not affect the marginal incentives that firms face under a carbon price it does not protect against production leakage.

So, let us say because of this policy there is a possibility that some of the installations may go out of the jurisdiction and that is called carbon leakage risk. The investment and plant manufacturing are going in a different jurisdiction away from the EUETS system to avoid that carbon price related penalty or cost. So, this risk of production and capital leakage that we call carbon leakage is that is flow of capital and production capacity to other countries where carbon price is less or this kind of scheme is not applicable is not as much protected. So, this grandfathering may lead to that as well. So existing productive capacity is maintained by grandfathering when there is a minimum production requirement.

However, investments into new capital or maintenance of existing capital may be lower. So there may be carbon leakage that the new investment and capacity building may go to those jurisdiction where this policy is not there and such carbon costs or carbon prices are not affecting your operations. So, the higher cost brought about by the introduction of carbon price sort of presents a risk that a firm may reduce the investment, may not do the capacity building or increase the output. In fact, it may transfer it outputs to other competitors outside this jurisdiction or area. Another important point is that it penalizes early action.

So early actors who acted to reduce their emissions invested in technology, so the early mover would face disadvantage because now their emissions are lower because they have implemented abatement measures much before this period of scheme and therefore the base

period that is selected for allocation of free allowances, they will get lower allowances because their emissions are lower. So, such early movers or installations who take an early action, they are not exactly getting benefit. In fact, there is a bias against them compared to those inefficient installations who have adopted this technology or still not adopted. They are still using inefficient older technologies.

And lastly, about new entrants and closures. So, the new entrants are at a sort of disadvantage here because firms that wish to intersect may be at disadvantage because they have no historical emissions on which to base their allocation through grandfathering. So, in this fashion, grandfathering can act as a barrier to entry also, which reduces the ability of EUETS to drive emission reductions and the reduced completion because of this entry barrier. This will delay also the decisions on emission reductions for existing firms who are not very carbon efficient and therefore they may choose to increase emissions or even sustain the current level of emissions because they are able to absorb this additional increase in carbon cost. How? Because of the free allocation through grandfathering. So, the barrier to entry may also prevent new firms, low emission technologies from entering the market and therefore help these less efficient carbon firms surviving the market more than justified.

And that is why any provision to adjust for this may be inaccurate or may leave the firm with a lower allocation than other firms. So, this grandfathering approach has these kind of challenges. So, to summarize this video, we discussed a number of challenges with the grandfathering approach. We noted that it is a slightly inefficient approach, and it has certain undesirable benefits, redistributive benefits. It should be ideally used and employed as a transitionary approach rather than a long-term solution.

It leads to windfall profits particularly to those installations that are carbon inefficient and have not acted early upon to mitigate their emissions. It also appears to be like a subsidy to those installations who have not been very carbon efficient, and it rewards high emitters for a certain period while they are operating with the older technologies. Also, it is not very strong against carbon leakage risk. It penalizes early action so it sort of goes against that spirit and those who are delaying the investment in such new renewable technologies, they are getting benefit in the form of windfall gains while those who have invested earlier, they get penalized by getting lower amount of allowance allocations. And also, it creates a sort of entry barriers for new interest because there is no historical emission data.

So, they also get penalized in that sense and it then helps or sustains those plant manufacturing installations that are using carbon efficient technologies by giving them higher allowances. In this video, we will discuss the concept of benchmarking-based approach to allowance allocation. Let us refer to this formula which is allocation equal to

benchmark into historical activity into adjustment factors. So, as the formula suggests, this benchmark-based allocation is a different method. In fact, it combines two features, and it is in contrast to the grandfathering approach which relies on emission levels for free allocation.

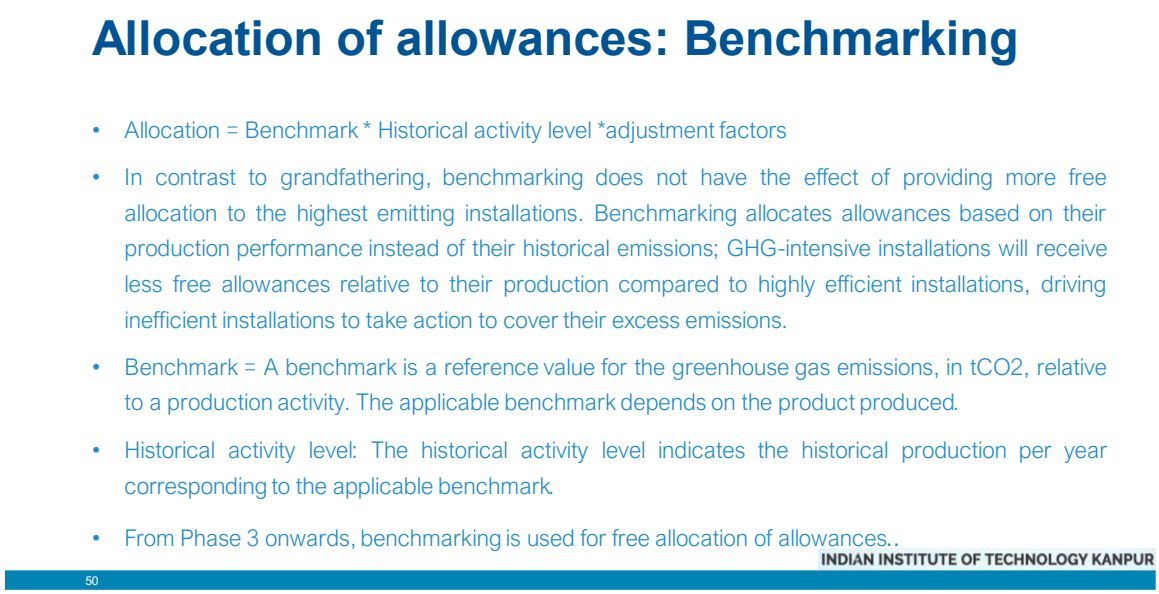
In contrast to that, in the benchmarking, we have two features where we compare a sector provide comparison to process and the production process and the product. So, we made a comparison on these two features of an installation with its own industry sector. And therefore, they are not matched on the emission levels as was in the case of grandfathering, but here we are matching them their historical output levels. So, all firms that are undertaking the same process or producing the same product will get the same benchmark and they will be compared against the 10% or a certain level of most efficient installations. So therefore, the size of allocation will depend upon the output level not on the emission level and then there are certain adjustment factors.

So these adjustment factors include carbon leakage exposure factor, cross sectional correction or linear reduction factor. We will discuss some of these technologies. So first we have the benchmark. So this benchmark depends on the product, industry sector and process and based on the most efficient installations who are in the same process, producing the same product in the same industry sector, they will be made for comparison, their emission levels will be compared and made your benchmark. So it's the product and production process rather than your emission that against which you will be judged.

Then you have historical activity level or HAL. This historical activity level indicates the historical production per year corresponding to the applicable benchmark that is set aside for you. Also, for the adjustment factor we have, for example carbon leakage exposure factor, we have discussed the carbon leakage concept earlier also. So it is a decreasing sort of factor which depends on the carbon leakage status and all industry sectors will receive 80% of allowances up to their relevant benchmark for free in 2013. This percentage then will decrease annually to 30% in 2020. However, sectors that can prove that they are exposed to carbon leakage will receive free allowances allocation even up to 100% of the relevant benchmark up till 2020.

Then there are cross sectional correction factor CSCF or what we call as linear reduction factor. This is a factor to ensure that the total free allocation stays within the overall cap at the EU level. So, the free allocation is calculated at the start of the phase 3 or when the new installation enters into operation. So, unless the installation undertakes significant capacity changes or experiences large decreases in activity level, the free location level remains constant over phase 3.

In fact many installations produce more than one product. So, in these cases installation can be divided into a number of sub what you call sub installations and then the calculation for this free allocation can be done for each of the sub installations separately and then aggregated. So, we can say here that in contrast to this grandfathering approach, benchmarking does not have the effect of providing more free allocation to the highest emitting installations. In fact, benchmarking allocates allowances based on their production performance instead of their historical emissions. The greenhouse gas intensive installations will receive less free allocation relative to their production compared to highly efficient installations which will drive inefficient installations to take corrective actions to cover their excess emissions. This is very important why because in contrast to the grandfathering approach where such installations who are not very efficient in terms of carbon they are getting penalized here where in grandfathering they were getting windfall gains.



Also when we use the word benchmark here, so essentially benchmark is a sort of a reference value for the greenhouse gas emissions in equivalent CO2 emissions or carbon emissions related to a production activity which is the most efficient coming from the most efficient installation. So, the applicable benchmark depends on the product being produced by whom by the efficient installations using the same process in the same industry sector. Also, there is something called historical activity level. So, this historical activity level indicates the historical production per year corresponding to the applicable benchmark and from phase three onwards benchmarking is used as a default method for pre-allocation of allowances.

So now let us quickly discuss some of the advantages. So, the main advantage of this approach is that it provides incentives for substitution within sectors by advantaging more

efficient firms. So first and foremost, this benchmarking approach has the advantage of severing the link between firms' emission intensity and allowances received. So, what is this? So, firms that have taken action beforehand the ETS to reduce their emission intensity will benefit related to those with high emission intensity and therefore we can say that early action is rewarded. This is unlike grandfathering where early action was penalized here early action is rewarded because now you have made your process more efficient and you for a given amount of production you are emitting less you are getting rewarded. In addition, as we have already explained under a grandfathering approach with periodic updating firms may be reluctant to reduce their emission intensity under the grandfathering as it will reduce the free allowances that the firm will receive in future.

So this challenge is largely eliminated by this benchmarking approach. It is the industry wide benchmark, benchmark by most efficient firms rather than the firm specific commissions that will determine the number of free allowances received in future. So, the firm therefore will benefit even more in the medium to long term from production efficiency improvements that will help them reduce their emission intensity. So, these are the key advantages of this method. However of course there are certain disadvantages for example calculation of product benchmark is difficult and time consuming and data intensive and it also creates so it is data intensive this is disadvantage. So it creates potential for lobbying around the location methodology there may be lobbying and complications arise through issues such as existence of similar products with different product processes.

So even if our producing the same product but your process different and some different processes have different level of emissions and costs that may create problems. However, the successful development of benchmarking approach in many jurisdictions indicates that these technical challenges can indeed be overcome. So, this was the first disadvantage but could be overcome. The second disadvantage is that risk of windfall profit. So even if the level of allocation is not dependent on the current output levels there are certain firms who are not exposed to competition and therefore their the product demand is inelastic so they can have this luxury to increase the prices.

So if they can raise the prices they will not be penalized and they will continue to have the same they can sustain their profits. And even if they get a lesser amount of allocation of allowances, they can sustain their profit by increasing the prices so that they can leverage the system. To summarize, in this video we discussed some advantages and the concept of benchmarking. We noted that as per benchmarking approach now I will be benchmarking and compared with the best and most efficient installations in the system. So unlike grandfathering approach where those installations that were even getting benefited despite using carbon inefficient approaches now they have to compete with the best in the business

who are more carbon efficient. In this video we will discuss the auction allowance method that is auctioning of allowances.

In the EUETS the use of auctioning has expanded over time. In fact, large scale EUETS auctions are held several times a week. These are single round what we call as single round single bid uniform price sealed bid auctions uniform price single round sealed bid auctions design and that is also most commonly used in carbon markets across the world today due to their simplicity for both users and administrators and their resistance to market collusion. So about 54% about 54% of allowances were auctioned or sold in phase 3 of the EUETS over the period 2013 to 20 and this auction method provides transparency much needed transparency and a steady price signal to participants and consumers and can also reduce the emission or carbon price volatility. So we discussed this auctioning method. First and foremost this auctioning of allowances involved allowances through a competitive bidding process allowing for price discovery and strong incentives for carbon abatement that means reduction of emissions.

Allocation of allowances: Auction

- Auctioning involves the allocation of allowances through a competitive bidding process,
- Auctioning allowances can be a more straightforward method than free allocation
- It also creates a source of revenue that can then be distributed to a wide range of potential beneficiaries.
- Auctioning helps improve price discovery, and market transparency
- Reduces the risk of distortions and rewards early action

Also this auctioning of allowances can be very straightforward method than pre-allocation as it does not require any collection of baseline data or negotiation of individual allocations or targets and it also creates a source of revenue for the government and regulatory body which can then be distributed to a wide range of potential beneficiaries. For example the income raised in an auction can be used by governments and regulatory bodies to support several objectives and the source of revenue this is a source of revenue which can be used to scale up the mitigating activities by supporting those industry sectors outside the EUETS or to compensate sectors outside the EUETS that are exposed indirectly to the ETS costs and impacts. So, all in all this auctioning method is a transparent allocation method that allows market participants to acquire the allowances concerned at the market price. In fact

during the first commitment, first EUETS period phase 1 that is 2005 to 2007 member states were allowed to auction up to 5% of their emission allowances and in the second period which ran from 2008 to 2012 the member states were allowed up till 10% but member states only exercised this right marginally in phase 2 only 4% allowances were actually auctioned the majority of allowances were allocated for free but from the start of phase 3 in 2013 all allowances not allocated for free will be auctioned they were auctioned and this meant that approximately 50% of allowances were expected to be auctioned with this proportion expected to continually rise throughout the trading period and the auctioning of allowances from the third period onwards is governed by what we call as auction regulation which specifies the timing administration and various other aspects of how auctioning should takes place to ensure an open transparent and harmonized and non discriminatory process. So, in all in all the auctioning is expected to help improve price discovery and market transparency and reduce the risk of distortion and rewards early action.

So let us discuss some of these benefits and advantages. So, first we are saying that this auctioning process will help reduce the potential for lobbying. So, auctions can be administratively simpler than free allocation approaches and they can reduce the opportunity for industry lobbying to support specific firms or sectors. Next, they help improve price discovery and market transparency and liquidity. So, they also improve liquidity, transparency and help in price discovery. So auctions provide a minimum amount of market liquidity and can also facilitate price discovery especially in cases where there is little trade in secondary markets by those who receive free allowances and also they help improve market transparency in providing reliable price signals.

So auctioning also boost the transparency of the market which in turn supports the development of a credible long term investment framework for regulated entities and also establishes confidence in the fairness of the market thus providing more transparency. Lastly also helps to reduce price distortions and rewards early action. So as described and discussed earlier different forms of free allowance allocation may distort the incentives to undertake cost effective abatement in an auction all entities pay the full cost so they have to pay the full cost in the auction which should lead to cost effective abatement and auction results in an efficient allocation of emission rights and the price reflective of the true value of the allowances in the market. Lastly the early actions those who are early movers and early people who have taken certain actions to mitigate emissions do not face any disadvantage and are fully incentivized since with the auctions the early movers need to buy fewer and fewer allowances this gives them an advantage over those who are not abating early on. Let us also briefly discuss the auction platforms so from the start of phase 3 a large share of installations will have to buy almost a part of their allowances to be able to comply with the EU-ETS with an increasing share over the years.

Auctioning Platforms

- From the start of phase 3, a large share of installations will have to buy their allowances
- One of the auction platforms is the European Energy Exchange AG (EEX)
- The second auction platform is ICE Futures Europe (ICE), which acts as the auction platform for the UK.

Example of allowances and emissions from the installation in the U.K.

Installation	Allocated allowances for 2005 in tons	Verified emissions for 2005 in Metric Tons	Short/Long in the CO_2 market
Drax Power Station	14,554,187	20,771,624	Short
Didcot Power Station	4,164,052	6,342,700	Short
Freshfield Brickworks	19,649	15,473	Long
Humber Refinery	2,580,539	2,351,567	Long
So'ton Geothermal	13,888	16,582	Short
Teesside Iron & Steel	6,306,630	6,370,456	Short
Toyota Motor Mfg	13,312	11,765	Long
Oxford University	3,969	3,443	Long

Source: http://ec.europe.eu/environment/climat/emissions/pdf/citl_uk.pdf.

So one of the auction platforms is European Energy Exchange AGEX acting as a transitional common auction platform for more than 25 member states and separately as the opt-out common auction platform for Germany. In fact, EEX is also currently being used by Poland and the second auction platform is ICE which act as the auction platform for UK which is also growing in size rapidly and since EU emission allowances are fungible EUAs obtained from either auction platform can be used to comply for the EUETS. Just an example of allowances and emissions in the UK you can have the see the name of the installation the allocated allowances in terms of their verified emissions and depending upon whether allowances are surplus as compared to emission or vice versa their short and long position can be computed. So, to summarize this video we discussed the auction method of allowance allocation, and we noted this is a very efficient method. Generally single round sealed bid uniform price auction design is employed across all the carbon markets.

It is a very simple method and it leads to allocation of allowances through a very competitive bidding process and leads to more transparency price discovery and also very creates very strong incentives for carbon abatement. So this process of auctioning has been widely employed from phase 3 onwards till phase 1 to free allocation was more dominant method but phase 3 onwards the auction based allocation of allowances is more dominant and it benefits in a number of ways for example reducing the potential for political lobbying, improving price discovery and market quality, increasing market transparency, reducing the risk of distortions and it also rewards the early action. And two major platforms that provide auctioning facilities are EEX European Energy Exchange and ICE Futures Europe. To summarize we noted that European Union Emission Trading System is a Cap and Trade based carbon trading scheme.

It is a market-oriented approach to achieve climate change mitigation related objectives. It covers more than 11,000 installations in the EU region and over 50% of emissions from the EU region. The scheme has been implemented in three phases starting from phase 1 2005 to 2007, phase 2 2008 to 2012 and phase 3 from 2013 to 2020. The first phase was pilot phase and it aimed to achieve a price for carbon through setting a free trading market for EUETS and the necessary infrastructure needed to monitor and report and verify the emissions from covered installations. However, this phase was characterized by excess supply of allowances due to economic crisis and prohibition of banking across phases.

Therefore these excess allowances became worthless, and prices fell to zero in 2007. Phase 2 coincided with the first quote-unquote-call commitment period. During this period, the market evolved as overall emission cap was reduced, more countries joined the scheme, penalty was increased from 40 euro to 100 euro. Moreover, new sectors and installations joined and more verified emission data was available for decision making. Although carbon prices recovered to some extent, nonetheless it remained subdued due to prevailing excess supply on account of legacy issues. Phase 3 witnessed considerable improvements as auctioning became the dominant method of allowance allocation against free allocation of allowances.

Moreover allocation rules across member nations were harmonized and instead of national caps EU wide cap was employed. On third phase onwards, substantial recovery in prices witnessed. In fact, prices reached 100-euro level, though periods of Covid crisis and Russia Ukraine war led to increased volatility levels and short-term falling prices. Nonetheless the robustness of prices is reflected in the steady recovery. One of the key reasons was the yearlong robust process of monitoring, reporting and verification which ensured smooth functioning of emission trading system.

One of the key aspects of this scheme was allowance allocation. In the beginning, first two phases, a bulk of the allowances were allocated for free. The free allowance allocation methods included grandfathering and benchmarking. Under the grandfathering approach, historical levels of emission were employed to allocate allowances. Under the benchmarking approach, output based methods which included categorization of installations across product and processes were done, then installations were compared against the emission of the best and most efficient plans for their production levels rather than directly looking at the emission of a particular installation. However, a more evolved approach is considered as competitive auction bidding of allowances is being stipulated which also results in revenues for the state and member nations.

Thank you.