Business and Sustainable Development
Prof. Trupti Mishra
Shailesh J. Mehta School of Management
Indian Institute of Technology, Bombay

Lecture - 26
Environmental Regulation and Policy Instruments

Hello welcome to this session. In this session we will see few Environmental Regulations and also few Policy Instruments.

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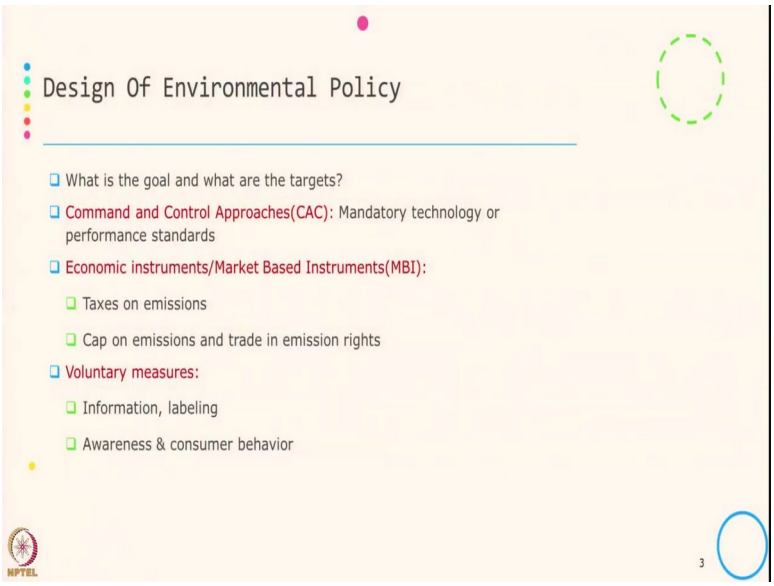

To start with let us see. What is typically a design of a environmental policy or typically what are the goals and the targets. So, if you look at in a many cases in the previous session we have discussed that typically how the policy are how the regulation has to be used as an intervention either to control something or to incentivize something. So, all environmental policy typically they deal with some goals and accordingly the fix of the targets.

So, when it comes to environmental regulatory instrument or the policy instrument for the environmental regulation it is of two types; one command and control approaches and second there are economic instrument or the market based instrument. So, typically what is a command and control approaches under this approach the mandatory technology or the performance standards given by the regulators. So, this when we are

saying that mandatory technology or the mandatory standard that is come under the command part of the regulatory instrument.

And the second part is control which means one is you have setting up a target that what has to be achieved that is in term of the targets given that is command and second also the monitoring and also control.

So, if the targets are not being met or the targets are being met, whether how to control that or how to monitor that; that comes under the second part of the instrument. So, command and control approach it also typically known as a traditional approach one of the first approach in environmental regulation which prescribes a mandatory technology and performance standards to the organization.

Then the second type of instruments or the second type of policy instrument is the economic instrument of the market based instrument. Now typically here when we say market based instrument apart from giving a targets the other specific picture of market based instrument is that when you achieve the target or when you go beyond the target there is some incentive associated with such kind of instrument.

So, the typical example can be a emission tax that is tax on emission or the cap and trade that is cap on the emission or the trade in the emission rights.

So, here the cap deals with the target part of this and trade deals with the emission rights which is the part of incentives. So, if I am meeting the target and beyond that also I am doing a emission reduction I will get some benefit because that I can trade there is a economic value associated with the surplus or the additional incent additional effort what I what the organization that putting for it.

Then the voluntary measures; voluntary measures is our information given on the product about the environmental impact, different eco labeling what we have discussed in our strategy when we are discussing about the eco branding and also creating awareness and consumer behavior, looking at the consumer behavior all this comes under the voluntary initiative.

So, there are mostly three types of approaches one command and control approach that is come under the traditional approach where the standards is given and also the control is

being done whether the standards are achieved by the organization or not. Second economic instrument or the market based instrument where there is incentive when you meet beyond the targets and voluntary measure is providing information labeling all the compliance view of the complaints also that comes under the voluntary one.

The one example is that when there are suppose 100 company they have to go through the disclosure regulation. If the company is not a part of mandatory group they should go for the disclosed regulation if still they are doing it and they are disclosing then this will comes under the voluntary measure or the voluntary initiative.

So, if you remember at regarding this we also talked in our strategy when we discuss about the voluntary environmental initiative when you go the beyond the complaints and also sometimes when the organization are not the part of the complains still if they are doing it that comes under the voluntary initiative.

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Now, let us see what is the difference between the command and control approach and market based instrument. So, command and control approach is known as typically we are putting this as a abbreviation of CAC and market based instrument is the abbreviation of MBI.

Now, what is command and control approach? So, as we have already discuss this is emission standard, process and equipment specification, limits on input, output,

discharge and require to disclose information and audit all this comes under the command and control approach. And emission charges, subsidies, tradeable permits or marketable permit and deposit, refund system, licenses all this that comes under the market based instrument and the environmental initiative.

So, the typical example of the emission or standard is that for vehicle we have the Euro 6 that is Bharat IV, Bharat 6 or Euro 6 that is the standard for the vehicle that is what the mandate what has to be followed. When it comes to tradeable permits it is when you have more if you have reduce emission which is more than the targets the rest of it you can use a permit which can be traded in the market. The detail of this will see when we discuss about the emission trading scale.

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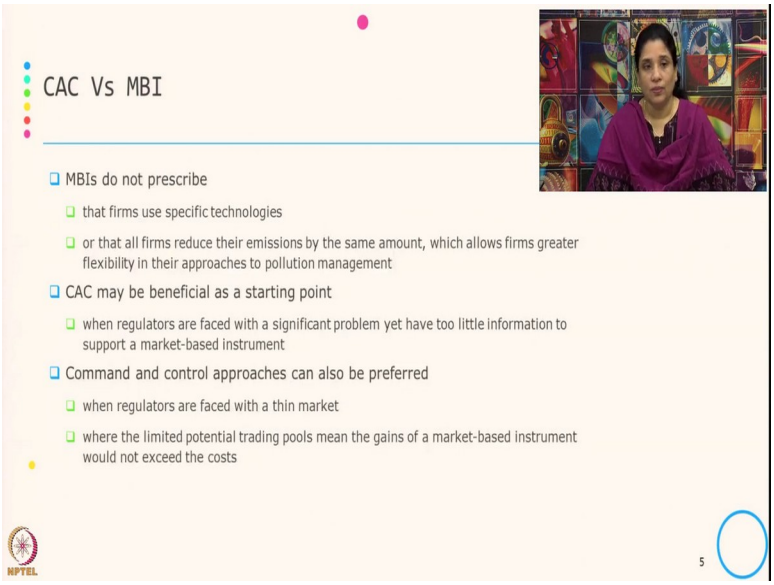

Now, the other differences can be market based do not prescribe that firm use specific technology, all firms reduce their emission by same amount, which allows firms greater flexibility in their approach in the pollution management. So, here all firms reduce their emission by the same amount the standards is like whatever the standard for the targets the targets are given, but market based instrument they not say they do not say the organization that you need to use the specific technology to reduce your emission.

So, here they there is a flexibility associated with market based instrument because it is not being prescribed that the firm should use this technology or the firm should use the other technology. However, when it comes to CAC it may be beneficial at the starting

point when regulator they face the significant problem because there is not enough instrument about the market base instrument like since this is new and who are the players in the market.

Typically how you trade the permit the market is not yet established the price of the permits are not being established or not being smooth. So, in this case it is from the beginning when the regulator is putting this as a instrument in the beginning it is always beneficial to use the command and control approach.

Command and control approach can also be prefer when regulator phase with a thin market as we discuss and also there is a limited potential trading pool means the gain of the market based instrument would not exceed the cost. So, the typical example here I can give you is that. So, how do you generate a permit?

You generate a permit by reduce reducing the emission; reducing the emission is not free reducing the emission also incur a cost. So, if you are getting a price which it not more than the cost what you have incur in the reduction of the emission then specific then it is not a win situation or it is not a profitable situation for the organization. So, in this case they will not try to reduce more to generate permit because anyway the price of the permit what they are getting that is not more than whatever the cost they are incurring.

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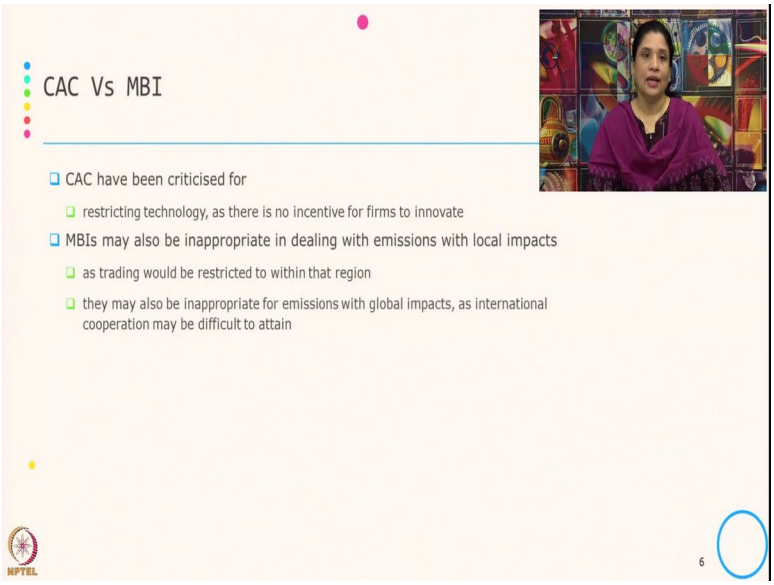

Now, the criticism associated with command and control approach is that there is restricting technology there is no incentive for the firms to innovate because any the technology is given there is a restriction associated with the technology since you cannot change the technology there is no incentive for the firms to innovate. Market based instrument also inappropriate in dealing with emission with the local impact because as per the tradeable permit the trade trading can happen in any market.

But if it is specifically related to the local impact trading would be restricted within in that region and it is inappropriate for the emission like with global impact as intensive cooperation is difficult to maintain. Because if the permit is only for the local impact how do you trade this with the rest of the world. So, in this case if it is market based instrument is typically inappropriate when we deal the emission with the local impact.

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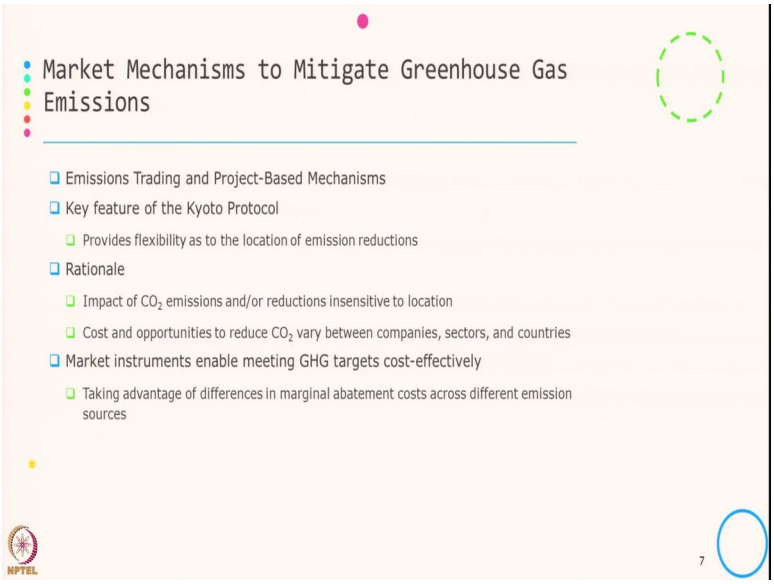

Now, let us say a little bit more on market mechanism to mitigate the greenhouse gas emission. So, the typical instrument over here is that emission trading or the project based mechanism. Now this is one of the key features of the Kyoto Protocol because it gives the flexibility as to the location of the emission reduction.

So, why it is considered as a flexibility, because it gives the option that even if the impact is over here this can be reduced when you are buying a permits or when you are buying the certificate from the other places. So, there is a flexibility that how the company or how the industry they or how the country they will reduce the emission.

Now what is the rationale behind this, impact of CO 2 emission or reduction is insensitive to location because this is global in nature and cost and opportunity to reduce CO 2 vary between company sector and countries. It means the objective behind giving this flexibility is that CO 2 when we are reducing CO 2 over any places it is contributing to the reduction in the global emission but so it is insensitive to the location.

But the point is that why do we reduce somewhere else. We reduce somewhere else because the cost associated with emission reduction is typically differs between company, between sector and between country. So, it is always preferable that where can you reduce your emission at a lower cost and accord that is why this specific instrument gives the flexibility is that to choose a low cost effective option for emission reduction.

Market instrument unable meeting GHG target cost effectively and taking advantage of the difference in the marginal abatement cost across different emission source what we have just discussed that the abatement cost or the emission reduction cost typically differs between companies, between sectors and between country. So, market based instrument allows the stakeholders to take the advantage of difference in the marginal abatement cost that is across sources and choose the least cost effective option.

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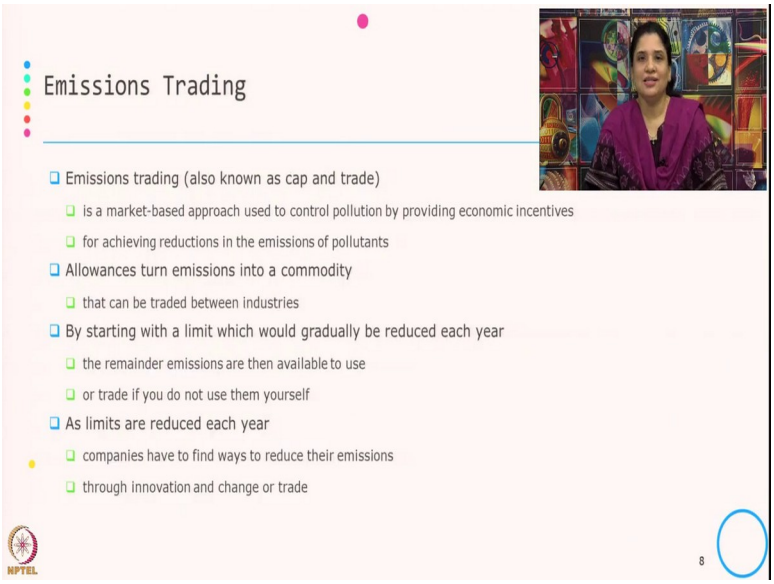

So, let us understand little bit more about the emission trading. So, this is also known as cap and trade and if you remember in the beginning of this session when I was trying to explain between the difference between the command and control approach and market

based approach here the specific feature of the market based instrument is that it gives economic incentive and why it gives economic incentive because there is a there is a when they achieve this economic incentive if they are achieve the reduction into the emission of the pollutant.

So, if they are reducing the emission and at some point of time if they are reducing more than the target there is a economic incentive associated with this. Now this allowance turns emission into the commodity that can be traded between the industry. Now let me give you small example over here. Suppose the regulator gives a limit to all the industry in the country that they can only emit 100 unit of CO 2. Now looking at the profile of the different industry few industry will emit more than 100 units, few industry will emit less than 100 units.

Now, how the market will be created over here? Suppose if someone is emitting less than 100 the reminder emission will turn into a commodity. Why it will turn into a commodity? Because there is a economic value associated with this or there is a market value associated with this. So, why there is a market value because whatever the remainder emission what they have not emitted they can sell that in the market or they can trade into the market to the other industry and there is a price for this commodity.

Now, the question is that, who will buy the commodity? So, there are other groups of the industry who is emitting more than 100 CO 2 units, for them since the limit is 100 CO 2 units they need to buy the whatever the additional they are emitting they need to buy the similar amount of commodity from the market and the commodity has different name sometimes it is being called permit, sometimes it is being called certificate, sometimes it is being called different in the different under different instrument you will find the name is different. So, they will buy this.

So, here typically how it works is that the limit is given the limit has different implication for the different industry, few will reduce, few will emit more by the emission from emission of commodity from others and few will emit less and sell time the emission commodity in the market. And the price associated with this would be the economic incentive or the benefit for those industry who are emitting less, but here we need to see that the limit is going on reduce by each year.

So, possibly in the first year the limit is only 100 CO 2 unit, next year it would be 90 CO 2 unit in this case now the industry the decision point for the industry is that whether they should try to emit H for the limit or they should emit whatever there is whatever is the coming out of their products and process and they will go on buying whatever the emission commodity. Now the decision point over here is based on the cost and benefit. What is cost what is benefit over here?

Whenever there is suppose the limit is 90 and in order to be in that limit they need to change their technology, they need to change their process through the innovation which will which will give the reduction in the emission. But that will not come as free there is a cost associated with this. And if the cost associated with this then they need to see what is the cost of the innovation associated we change a technology, change in the process and whatever the price of the emission commodity.

If the price of the emission commodity is higher than whatever cost they are incurring they will prefer to do the innovation in the change of the technology, change of the process rather than buying it or rather than getting it from the other industry. But if the cost they are incurring in the long term it is still more than whatever the price of the commodity then they will prefer to buy the prefer to buy the commodity in the market rather than doing changes in their process or changes in their technology.

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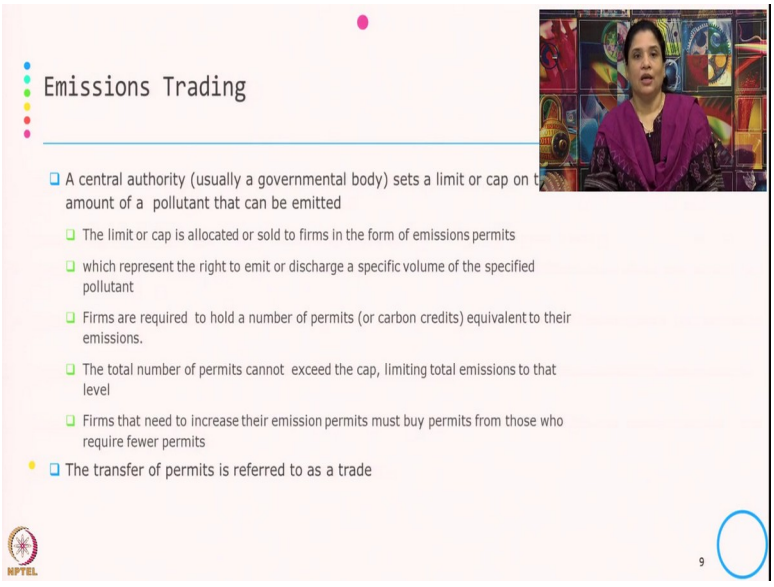

Now, how it works, there is a central authority usually is a usually governmental body set a limit or the cap and the amount of pollutant that can be emitted. The limit or cap is allocated or sold to firms in the form of the emission permits, which represents right to emit or discharge the specific volume of the specified pollutant. Firms are required to hold a number of permits that is called carbon credit equivalent to their emission.

The total number of permit cannot exceed the cap limiting the total emission to that level. So, whatever the number of permits you are holding it has to be equal to the emission what they are whatever the emission they are coming out of their process or the emit or their discharge.

The total number of permit cannot exceed the cap limiting the total emission to that level and firms need to increase their emission permit must by permit from those who requires the fewer permit. The same thing what we have discussed in the previous slide and the transfer of the permit is referred to as a trade.

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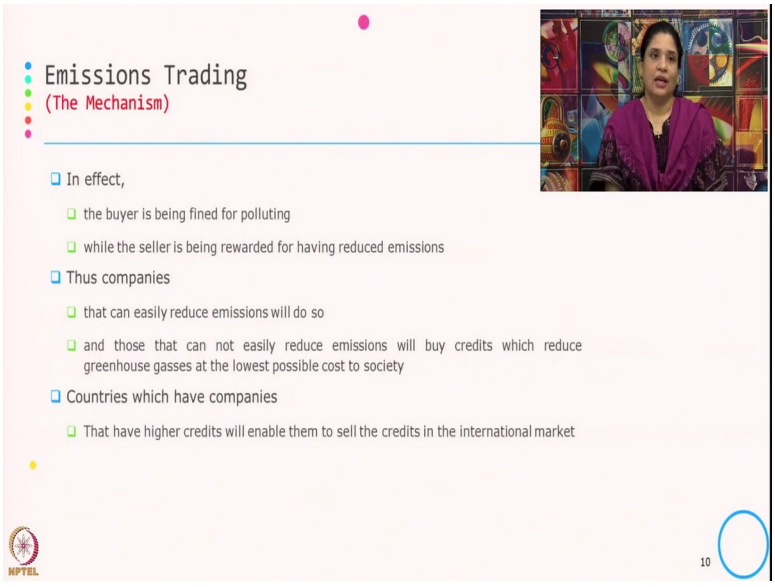

Now, in effect because of this mechanism in effect the buyer is being fined for polluting while the seller is being rewarded for having reduce emission. So, what the company they will do, they can easily reduce emission will do so, those cannot easily reduce the emission will buy the credit which reduce the greenhouse gases at the lowest possible cost to the society. So, here typically the buyer those who are buying the permits they are

fined for polluting because they need to buy and the seller is being rewarded because they are having a reduce emissions.

So, in one way their processes environmental friendly and also through the permits they are able to sell it in the market and get the economic incentive. So, company those who were easily they can reduce this they will reduce this and others who feel that the cost or the technology or there is some inefficiency associated with reducing they will prefer to buy it from the market. Country which have company that have higher credit we will unable to sell the credit in the international market.

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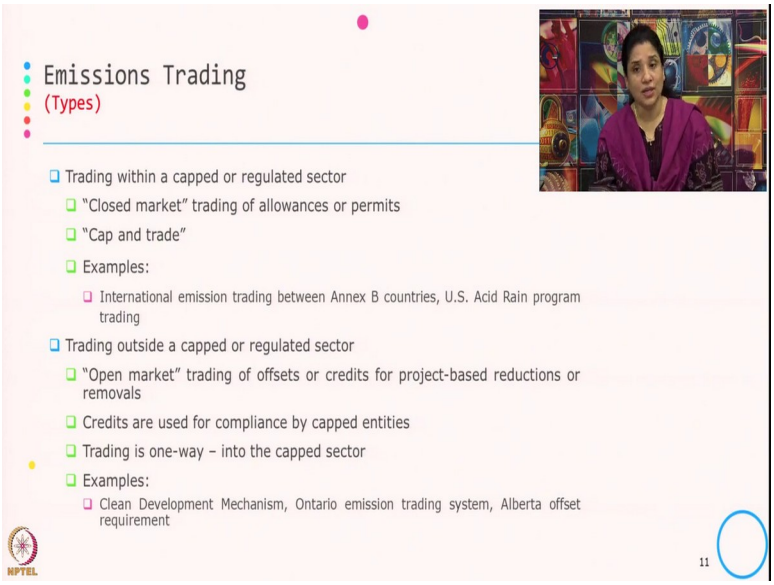

So, there are different types of emission trading, the first one is trading within a capped or the regulated sector. So, this is typically known as the closed market trading of allowances or permits and the example of this type of emission trading is the International emission trading between Annex B countries, US Acid Rain Program.

And the second type of emission trading is trading outside a capped or a regulated sector and this is at like in the previous case it was a closed market, if this is your “open market” over here and this open market trading of offsets and credit for the project based reduction and the removal.

Credits are used for complaints by the capped entity and trading is only one way that is to the capped sector. This is the example of our clean development mechanism what we will see further an Ontario emission and trading system and Alberta offset requirement.

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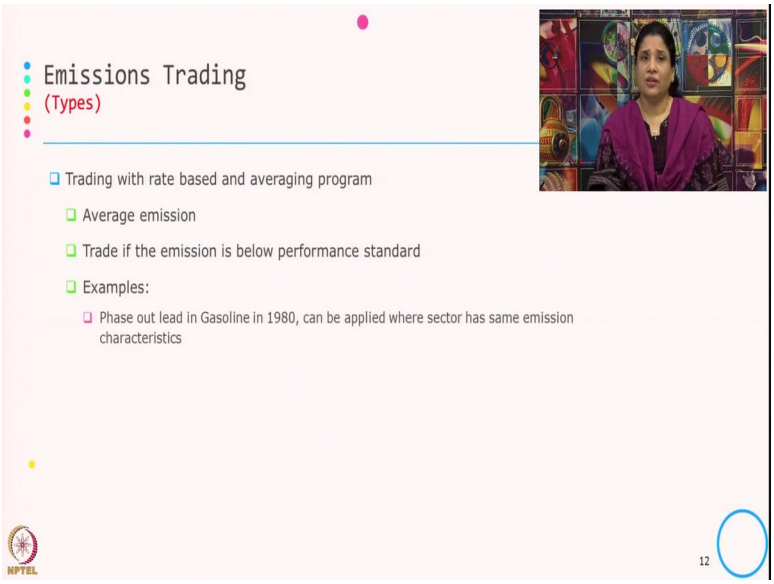

Then the third type of emission trading is trading with rate based and averaging program. Here the average emission is being identified, trade if the emission is below the performance standard and if you are above the performance standard then you can sell. So, examples can be phase out lead in the Gasoline in 1980 that can be applied where sector has the same emission characteristics.

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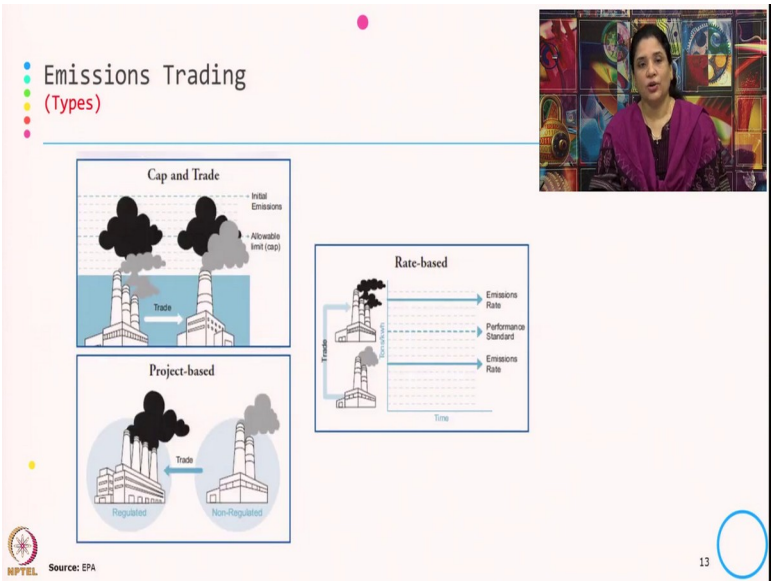

Now this is a pictorial representation of all these three types of emission trading. The first one is the cap and trade there is a initial emission then there is a limit and if you look at the where the emission is less than the limit they can trade with the other where it is more than the limit. Then the second one in case of project based then the non-regulated they can trade with the regulated one. So, in order to achieve the limit the regulated one they will buy it from the non-regulated one.

And the third one is the rate based on the average one for the performance standard is given and if it your emission rate is below the performance standard then you can sell the permit to the to those sector or to those industry where the emission rate is higher than the performance standard. And the first one is the closest one, second one is open, but only with the cap sector and rate based is typically it is being used in case of all the industries.

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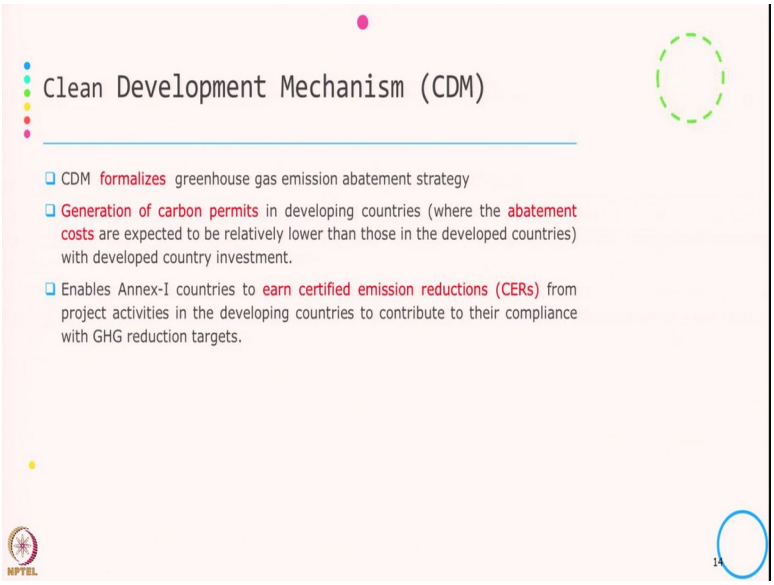

Now, let us see what is clean development mechanism. So, clean development mechanism is again one of the flexibility mechanism which is given by the Kyoto protocol. This formalize the greenhouse gas emission abatement strategy and in this case the generation of the carbon permit is developing country where the abatement cost are expected to be the relatively lower than those in the developed country with a developed country investment.

And enable Annex 1 countries to earn certified emission reduction from the project activities in the developing country to contribute to their compliance with GHG reduction target. So, before getting into this CDM let me just quickly introduce this flexibility mechanism of the Kyoto protocol. So, if you must all be you almost be knowing that Kyoto protocol where they have introduce the two type of flexibility mechanism one is CDM and second one is the joint implementation.

So, joint implementation is that where developed country can together work on reduction whatever the targets given to them how on the emission reduction targets they can achieve that. And CDM is that where the flag where which flexibility mechanism which says that develop country given a targets and in order to achieve the targets they can invest in the developing country and whatever the permits they will generate from these those investment that can be counted as a part of their targets.

So, in the Kyoto protocol, all the country it is divided into two types of two groups; one is Annex 1 country and second one is the non Annex country. And whatever the targets given by the Kyoto protocol that is mandatory for the Annex 1 country where it is not mandatory from the non-Annex country. And this flexibility mechanism says that in order to meet the targets in order to meet the mandates the developed country they can invest in the developing country.

And why they should invest in the developing country? Because the cost of abatement is typically low and whatever the carbon permits they get by investing in the developing country that can be part of their whatever the targets or what of that that can be part of your GHG reduction target or part of the compliance target.

So, we will talk more about this clean development mechanism in the next class. Let me briefly summarize what we have discussed in this class. We have discussed about two types of market based two types of instrument one is command and control and second one is the market based instrument. And also we have seen under this market based instrument what are the different types of emission trading instrument of the different types of the emission trading mechanism and typically how this cap and trade or how this emission trading works.

Thank you.