

Audio Title: Runge-Metzger on Tracking Climate Change Under the Paris Agreement
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Transcript

Intro: Welcome to the Mossavar - Rahmani Center for Business & Government at the Harvard Kennedy School. For more information on events, news, and research, visit www.mrcbg.org.

Joe Aldy: Welcome to Regulatory Policy Seminar. I'm Joe Aldy, the Faculty Chair of Regulatory Policy Program. I'm glad you're able to join us today. I'm thrilled to have the opportunity to hear from and learn from Artur Runge-Metzger. I've only known Artur like 15 years. Artur is the Director for Climate Strategy Governance and Emissions from the non-trading sectors within DG Climate Action in Brussels. So put that in other way, in Brussels, they have an entire department, a ministry if you will, organized to address the issues of climate change. And if you are familiar with the American system, Artur is sort of the equivalent of an undersecretary in this directorate tackling climate issues.

Artur has been there in one form or another working on climate change issues in Brussels for a while specifically for at least 15 years now although that directorate has sort of evolved over time. Probably originally, it was just the climate group within DG environment.

Artur Runge-Metzger: We were 25 and we are now 200.

Joe Aldy: OK. So reflecting the seriousness of which Brussels is tackling this issue, I had the pleasure of working with Artur when I was in government in 2009-2010. We were working through the rather challenging Copenhagen period that I think laid the foundation for the much more productive and well-received Paris period and international negotiations. And reflecting that, he is going to speak some on the issue of transparency which is quite important both when we think about international climate policy design but also how different countries go about implementing their domestic programs.

Artur will take questions of clarification during his talk but if you have deep serious philosophical questions you want to raise, let's hold those off until the end of his remarks during our seminar.

Artur Runge-Metzger: Or when we are on lunch.

Joe Aldy: Yes. And Artur, welcome to the seminar. Thank you.

[Applause]

Artur Runge-Metzger: Thank you very much. Thanks for the kind words, Joe. And thanks for inviting me to Harvard. I arrived yesterday and went around a little bit. I said, "Wow! This is a wonderful place." So I think it's – yeah, something I couldn't think of myself to be here.

[Laughter]

And I was thinking, what would have become out of me if I would have studied here? OK. Transparency first, that's the topic. And it's a little bit broader looking at government systems when it comes to tackling climate change but not internationally but also in the EU. So I want to show how these two things are going to interplay with each other.

I will start with some very few basic remarks in the beginning so that you understand how I would define transparency and why I think or we think it is important. Then look a little bit at the evolving governance and then all the years will pass by so it's a little bit kind of a short history of how this government system was evolving.

And then I want to give some examples on OK, what comes out of this transparency process and how do we use that information really for policy-making in Europe. And I think there are still a lot of ample room for improvement and here, maybe it's also something where I academia could help in the coming years to focus better on the analysis on OK, how do you do policies in the proper manner.

Why transparency? In Europe, we introduced what's called evidence-based policy-making. So you want to build your case on trying to convince why do we have to do that. And you have to look at the signs. And I tell you, if you look back on climate, of course 20, 30 years ago, it wasn't an evolving subject. You were kind of the lone voice in the huge government and the only way we could really start convincing is by using all the signs and the IPCC, the Intergovernmental Panel on Climate Change was very instrumental.

But that gets further because we need to have the information from all the sectors that should contribute and put that into impact assessments, into big policy analysis. And if you compare across the government, what you will see is that this evidence policy-making is really taking climate or has been climate policy forward in Europe. So it's the preparatory phase that is very important.

It also allows you to make comparisons. And that's important in Europe because we are 28 nations together at the moment, 27 soon. If you want to aggregate national efforts so that you understand, OK, who is doing what, and compare, is the effort the same from one country to the other? And how do you deal with national circumstances? And what's true in the small world of the EU is definitely true in the big world of the globe. So you have 196 nations that were coming together under the Paris Agreement.

The next thing why transparency is important is that you can build interesting policies on that. And one of those for instance is to make things tradable. And if you want to trade something, you need to have a product that is very well-defined and you need then with that you can send a market signal which means a carbon price.

And finally, transparency is important in order to make sure that everybody is accountable and that there is compliance. In 2015, we were making big promises to each other in Paris. And the question is now, are we really delivering on that and are we complying with what we were doing in the past?

So I see transparency as the real backbone of domestic legislation but also of international treaties. And if you want to compare, very often I think it's compared with the disarmament where you say, if you don't have the information on where the nukes are then kind of it's not going to work. And I think we just see that in the international negotiations.

And it is for trade important. It is important for building trust and confidence across the world in order to make sure that this is helping. And you will need transparency and what you get there throughout the entire policy cycles, so not only preparation but also when you do the implementation and when you do the monitoring and the evaluation of those policies.

What are the elements that you will look at when you look at reducing greenhouse gas emissions? I think first and foremost, it's important to set standards globally in terms of measurement. You need to define the scope and the system boundaries. And I think you have come across very often the whole issue around carbon footprints which crossed borders. But at the same time in the UN, the decision while taken on very early that we will have to stay within the remit where we have our sovereign powers.

So all the information that is gathered is bound to the national boundaries because that's the place where you are responsible for. And maybe a little anecdote on that, I was once on the panel with a Chinese colleague and half of his speech, she was talking about China being the workbench of the world and that 30% of the emissions are not due to Chinese consumption but due to consumption in Europe and the United States. And when I say, "Look, I have no problem to take on my shoulders these 30% of emissions but you will have to give me the right to regulate," and that finished the argument that she was making that afternoon.

So we need to make sure that one ton of CO₂ equivalent is one ton of CO₂ equivalent wherever you are in the world. You have to define which gases you are going to take into the mix and I think that is what we have done at the international level. We need to decide on the common matrix because each of these gases doesn't have the same implication. What we have been dealing with over the past is in particular the so-called global warming potential so you will know that there's a discussion that methane for instance has a much higher global warming potential than CO₂ so you weight it in a different way.

There are different matrixes that have been discussed all along. One that is always coming up is that so-called global temperature potential. So what is really that – how many degrees it's going to give to the global warming? Something that Brazil is pushing in particular.

And then you need to have reporting guidelines. And the interesting thing is that at the international level, you have the IPCC. So this international panel of climate scientists developing these guidelines over the years, refining them from one year to the other and it's kind

of a tiered reporting. So you do that in different level of qualities. So if you have sectors that are not very important in your emission profile, you will have a very rough estimate of what that means in terms of CO₂ or methane emissions or emissions of nitrous oxide.

If it's a very important sector then you move up the tiers and the estimate becomes more and more accurate. And of course, it is easy to be done in the energy sector. It's very difficult to be done in the agriculture or in the forestry sector, estimating what is going into the atmosphere.

You have to then also decide on how do you do the reporting, the frequency, the level of detail. And then in terms of the accounting, what do you do with the reported data and how do you take that into account? I will come back to that when I talk about the Kyoto Protocol. You have to think of the relevant base years on which you compare what you have been doing emitting over the years.

And then finally, you have to decide on, is there a step called verification of all the data that you are collecting? So here, we've used compliance, third party reviews. These are questions that you need to clarify if you want to know is this going to be an effective transparency regime?

So let's have a look in terms of how this was evolving over time. So I have here the timeline. So in the late '80s kind of climate change became a topic and the United Nations was starting to look at this. It was had you had the first report of the Intergovernmental Panel on Climate Change saying, yeah, you have really a problem and you need to do something about it.

And what was decided in terms of transparency? In terms of transparency, because it was a very political discussion, the first thing you will observe is that it was looked at in the so-called bifurcated way because developing countries were saying, "Look, this is a problem that you created as industrial nations. It was not created by us."

So first and foremost, we need to measure and we need to know where are these emissions coming from and particularly also, to look at the historical timeline of that. So that's why in terms of content, in terms of frequency, financial support for developing countries in terms of review, you had a system that had two strands, one strand on industrialized countries and another strand for developing countries. And for instance, the least developed countries will said, "OK, you can do an inventory of your emissions but you don't have to if you don't want and if you don't have the means."

In terms of the hard information that was collected were so-called annual greenhouse gas inventories but that was for the developed countries. The developing countries, that was a timeline every 4 or 5 years so they could do an inventory. So if I look at the time when I joined the climate negotiations and had an inventory from China, that was kind of 10 years old. So kind of, how much does that tell you for the future?

We also had to do so-called projections to say, "OK, how is that moving into the future?" Because then you will only see, is this problem going to be resolved or is it becoming more and more difficult in the future?

Then there's an element of soft information, the so-called national communications where you would just list what are the actions you are taking as a government, policies, measures, what finance you do, what you put into technology development, adaptation or something that was put – you put normally into the national communications just to show your engagement on how do you respond to the problem of climate change. And you would do these national communications every four years as a developed country and then in a regular manner for the developing countries.

And in terms of governance of the whole system, a kind of peer review was established. So you would have expert teams from different countries that would have a look at your national communications, that would have a look at your annual greenhouse gas inventories to see whether you really followed the guidelines that were established by the IPCC.

So how did we respond as EU to that? First of all, we ratified the UNFCCC in 1993 and we put the first piece of legislation which was called the Monitoring Mechanism Decision. And what it does is it was practically mirroring what was decided at the level of the United Nations. It was just that. So we implemented everything what was decided in terms of hard information, soft information. And then we created our own governance within Europe because we as EU, at the time we were 15-member states, we had to collect the information from the different member states. There had to be a quality check.

So the EEA, the European Environment Agency, was doing that job for us. They would deliver a technical report to the commission and we would then go out with a progress report. And when we were discussing with member states, a Climate Change Committee was created to look at methodological issues. So there were two working groups, one on the inventories, one on the projections, trying to improve it over time.

And I must say that worked very well because there were interesting things done in individual member states. For instance, in one of the first inventories, Luxembourg came up with, it excluded all the emissions from transport because they were saying, “No, this is fuel sold to somebody from France or somebody from Belgium or somebody from Germany.” So they took that out from their inventories. So it was not really territorial-based.

On the other hand, what they did is because Luxembourg import the local electricity, they are trying to estimate where this electricity was coming from and the emissions related to that. So they had to estimate, OK, is this coming from a nuclear facility just a few kilometers South of Luxembourg from France that was then zero emissions or was it coming from a coal plant in Germany? So in that way, they try to capture that. So they were told off of course by the peer reviews in the beginning and they had to change their system over time. So that worked.

What we also saw is that when it comes to the implementation, look, we are only looking really at the develop world when it comes to the inventories. And if we want to do policy-making internationally, you need to have more information. So we created together, first we started with – there was a kind of consultancy contract, the Emissions Database for our Global Atmospheric

Research called EDGAR. And that was not only looking at the greenhouse gas emissions, it was also looking at traditional air pollutants because we have the clear top, the UN Convention on long range air pollutants that were going around. We have this problem with the acid rain in Europe. So all of that was put into this EDGAR project, and it's still running today. It has been incorporated now into the commission. It's run by the Joint Research Center which is one of our big departments and is giving every year those data.

Normally, the reports come out just before the big caps. And this is also data that is taken into account by the IPCC to see how global emissions evolved.

Now, the second phase was the Kyoto Protocol. And in 1997, so it was a decision that industrialized countries need to take the lead and we need to move forward and then we had all the rules that was established in the Marrakech Accords in the year 2001. Of course in the meantime, the United States, the Bush Administration ran away from the Kyoto Protocol. Still, there was a whole system of new features coming to the transparency regime.

First of all, it was targeted practically only at Annex I Party, so the developed world, because they had commitments under the Kyoto Protocol.

Hard information. We moved away from reporting to accounting and this was particularly important when it comes emissions from land use change and forestry which is not straightforward. And even kind of the negotiations were very, very deep and took very, very long and still we ended up with something where, OK, you had apples and pears a little bit but in the end, it was all expressed in CO₂ equivalent and you could add it up.

What was also created in terms of hard information is so-called National Registries, because every country had a budget and this budget was expressed in assigned amount unit. So that was the amount of emissions you could have. And these AAUs were held in these National Registries.

And of course, Kyoto is also known that it allowed Emissions Trading so you could trade these AAUs across borders between the different parties and that is again, Annex I Parties and you had to create this trans-action law to really know from whom you get AAUs and from you subtract. So you do it in a very orderly manner to know what is happening. And that of course, all contributed to transparency. That was the idea.

The soft info, yes, there was more information required on national communications. One example is what is called the so-called Impact of Response Measures because there are many countries particularly in the Middle East, very concerned that oil consumption would down very fast so that would mean their revenue from the oil exports would go down so that would have negative impact on the economies. So the developed countries were supposed to say, "What is the impact of our policies in Europe or the policies that would have been taken to the United States on the Middle East?" And then to think of what could be done.

In terms of governance, a big structure was built up because it was not only possible to trade in between the developed countries, these AAUs, but you could also have project of off-setting emission in developing countries. But again, you would have to control that so you have a whole set of project or projects that could be done and you would have to regulate and say, “OK, how much are you really saving in terms of emissions?” So the whole methodology had to be built up. There was a big secretariat that was – what was called the CDM Executive Board because this mechanism was called the Clean Development Mechanism.

Understand you had for the countries, the Annex I Parties, if they wanted to do projects with each other, you had what was called a Joint Implementation Supervisory Board. So a lot of structure that was put to the Kyoto Protocol.

And then on top, compliance committee with two branches, one was a facility one so if they see you are doing something wrong, they come and wave with the finger and say, “Look, you need to get better,” or if really at the end of the day the numbers do not add up, they could also become kind of punitive and I think that was one of the reasons when Canada saw their emissions were not matched with the number of assigned amount units they got, they dropped quickly out of the Kyoto Protocol because they feared that they would feel these punitive measures.

How did we react on that in Europe? First of all, there was a whole set of policy action was taken. So we had the climate change programs go in sector by sector identifying what we need to do in order to reduce the emissions. We started with an Emissions Trading System but instead of doing it with member states, so party to party, we said, “No, we do that with private operators.” So with the private sector.

We also had the Fluorinated Gases Regulation that came up. So that was the kind of first wave of legislation we were acting on climate change.

What does it mean for the monitoring and the transparency system? We did a kind of one-on-one translation of the Kyoto Provisions with one exception because we did not allow particular CDM credits from so-called Fluorinated gases.

But then in addition, in order to run on legislation at home, the whole monitoring requirements that you have at the national level were just not adequate enough. So we had to do and start an installation-based monitoring reporting and third party verification under the EU Emissions Trading System. So create additional transparency elements in Europe in order to allow for trading to happen. And that was then started in the year 2005.

And also, it has this registry because companies have certificates. In the beginning, they were given for free. Later on, these certificates are going – auctioned to a large extent and you could – with – in these registries, we see all the operations and in terms of who was the ones registering in the registry and account these were the individual companies or any individual because that is an open market in Europe as long as you have an address in Europe, you can participate in the Emissions Trading.

And the same we had to do for fluorinated gases. So again, it's a company-based monitoring, reporting, and verification for those companies who produce these fluorinated gases. And the same for the standards we did for cars and vans. Now, the manufacturers have to give data in the transparent manner on how efficient their cars are and they have to deliver them every year. So these were already was a deviation going much more into detail on transparency.

The next phase was kind of the so-called interim I would say between the Kyoto Protocol and the first attempt to have an international agreement and then to the Paris Agreement. So I don't want to spend too much time on this but what was happening at that time is that we had a kind of bifurcated process. We had those parties who were continuing on the Kyoto Protocol route and these parties were becoming fewer and fewer. So in the end when it comes to the second commitment period, and the Kyoto is back in Europe, Norway, Switzerland that are in it, the Ukraine I think. I'm not quite sure whether they made it in the end or not.

And you had then the so-called Cancun Agreement where all the other parties were in but including also the European Union. So we also took a commitment, another Cancun Agreement.

So what was done in terms of the monitoring, reporting, and verification system? Of course, one of the most difficult questions was this bifurcation between developed and developing countries. So there was a real attempt to try to bring these transparency streams closer together, and that was done by having kind of analogous provisions for both annexes, so for the developed countries and for the developing countries. You still gave them different labels and just said, "OK, one is reporting in uneven year and the other one is reporting in an odd year." But there were more or less similarities in the way the reporting was done and there was also a peer review because that did not exist for developing countries before. It was a very loose one.

So in terms of hard info, it was much simpler than the Kyoto Protocol because you are not talking about assigned amount unit, you are not talking about trading. So you went back to what we had in the beginning. It's a reporting of greenhouse gas emissions that we have.

In terms of soft info, it's the same as we had before, these national communications but then new provisions on financial support. That was one of the ways on making sure that one could move forward here to make concessions on being transparent on financial support which is one of the very difficult questions in all international negotiations. And what was also added is to have a kind of longer term vision.

So look forward on how are you going to transform your economy so this so-called emission development strategy is something that was a new feature in the whole transparency framework. So it was no longer just looking backwards. What did I meant two years ago, three years ago, four years ago but have also was looking forward saying, "What are the types of policies I would have to do in order to bring these emissions down?"

In terms of governance, yes, there was a system of Multilateral Assessment where you are put every two years into the hot chair and you have everybody else, the 196 parties looking at your

report and they are giving you easy or hard questions, depending on many things. But I think it is a system that was very important step forward from where we started in the beginning in the early '90s.

What did that mean for the European Union? First of all, because the commitment under the second commitment period and the Kyoto became much higher, so the whole legislative framework was kind of exploding in that period. So apart from the Emissions Trading System, we started to have legislation for the sectors outside the Emissions Trading System which covers about 60%.

We were looking at aviation, something where we had very interesting discussions with Washington over the last years and still have. We were looking at renewable energy and energy efficiency. Put them into directives. We had the so-called fuel quality directive where we added greenhouse gas emissions aspect and we started looking at carbon capture and storage as one of the solutions that you need to have if you really want to look at the climate problem.

And then finally, that was also a new angle is the mainstreaming of climate into the public budgets. So we had a provision of 20% climate mainstreaming into the European Union budget which is around €150 billion per year that we spend in Europe.

What did that mean for our monitoring reporting and the transparency? So we kept the Kyoto Provisions as they were until the year 2020. We added what came from the Cancun so that streams, so these bi-annual reporting. And then we added the revenue side. We strengthened that. So because in the ETS, we were starting to auction, we looked at how a member state is using the auction revenue. Is that something that flows back to climate policies, yes or not?

In addition, I think we now come into the space age. So we were thinking of look, one thing is to have the bottom up monitoring which you do through national statistics, national accounts. But of course, one area that is very difficult is the terrestrial observation. So forests, land, it's very expensive to do monitoring there. The methods we have are very costly from the side of the IPCC.

So we started looking with our Copernicus Program, how could we improve that? Of course, the Copernicus Program goes into much higher granularity. We talk about 20x20 meter in terms of the pixels, so that means you can really look at what is happening with your land use and then see how we can link these two things in the future. So that is one of the latest additions in terms of transparency. And it's not only looking at the change of the landscape.

But then one strand of research is also whether you can measure actually CO₂ fluxes, methane fluxes, and other greenhouse gases through space observation. So that is also a big research program that has started.

And now we say, OK, what is kind of – how can that help in the whole transparency? Paris. That was the big change and it's to show that this was started in Copenhagen. That is really that kind of changed the whole system at the end of the day.

It is kind of this so-called Paris ambition cycle where you go constantly through global stocktakes, reviews, new commitments you take. So in a very systematic manner, it's a process that has been established and it's a process that is the same for all parties under the Paris Agreement. I think that was really the big breakthrough. And that we had kind of the ratification and the entry into force within less than a year after the Paris Agreement was signed. I think that showed kind of the commitment of countries to it.

What does it mean for transparency? We have just decided on what is called the detailed Katowice Rulebook. There is a single track in terms of monitoring, reporting, and verification so there's no bifurcation in terms of a special system for those countries and a special system for the other countries. There is still differentiation because I was talking in the beginning of we have tiered system, so you can do something relatively simple but you can also do it very complicated. And different countries depending on their national capabilities can use different tiers. But the task is over time to move up to the highest tiers. But that will take some time. But at least, the results of the monitoring, you can compare and you can add up.

In terms of there is an idea that we can start again in terms of trading but it's something that has not yet been decided. That was not possible in Katowice. So these discussions will continue. One of the big issues was how do we avoid double counting that emission reductions I sell and somebody else is also using those emission reductions for his own accounts. So that is something one will have to look at.

In terms of the soft info, one new feature is the so-called mid-century strategies, so all countries are required by 2020 to come up with a long-term strategy.

In terms of governance, we have a compliance system that is attached to it but it is a facilitative. It's not a punitive compliance system so they will raise the finger and say, "Maybe yes, I've done something wrong." But you are not going to get in prison for anything. And that was important for many countries to be able to accept the Paris Agreement.

So what does it mean for the EU? Very simple. First of all, for the period after 2020, we will delete all Kyoto features from our rulebook in terms of transparency. But at the same time, we are further evolving our transparency system because what we see in our discussions in Europe, if you really want to make policy, you cannot always come and say, "My dear, I want to reduce greenhouse gas emissions." No. People want to see that in a broader context. They want to know, what does it mean from an energy security? What does it mean for my energy efficiency? What does it mean for in terms of how much money I have to spend on research and development?

So what we were creating over the last three years since Paris is a completely new governance system. It's called European Energy Union Governance System. So we take the entire energy sector and put it into a new transparency system that not only looks at the six greenhouse gases but it looks at many features at the same time.

What we also added is a new element of forward-looking because what we also see in Europe is that in terms of the policy planning, there is big variability between the different member states. So the – what we added is National Energy in Climate Plans in order to make sure that countries, if they make a process for the year 2030 and that is what we are talking about at the moment, that they know how to get that. A lot of the responsibility to fulfill the commitment still nice with member states, the 60% of the emissions.

Then in terms of the whole cycle that we had in Europe in terms of review and looking at it, that is a line with a Paris cycle. So instead of having one year compliance cycle, we move to a 5-year compliance cycle as we have it under Paris. So that also simplifies the compliance in Europe a little bit. And in terms of governance, we created a new committee which is the Energy Union Committee which goes beyond greenhouses gases only. So it's much wider than what we have.

So that is kind of where we are out now testing that in the coming years. And that's going to be very interesting. Just to say when we were discussing this with member states, with Energy Union Committee, there was a battle between the different ministries, the energy ministries and the ones responsible for climate. Everybody say, "But I want my committee. I want to keep my committee. I want that committee." So kind of it's the first step. It's not perfect yet because we still have many other committees that are somehow structured around this but I think it's a first big step forward.

So now, I want to come and say what do we really do with all the data that we collect? Of course, we need to report on annual progress so we can say, "Well, how has our emissions developed? What is the projection and kind of what have we promised to do?"

And then say, "OK, is there a problem going to come?" And you can see here until 2020, we will be practically fine if you look at our 230 target. You will see that the projections at the moment say, "No, we are not going to get there." So the coming years are very important and therefore, it was important to get these plans which member states have just delivered to the commission that are in place.

What we also I think want to look at is how does this sit with the economic growth in Europe? So, we always compare the GDP, how it's developing since 1990 and then put it against the greenhouse gases that you see here. So that's transparency in terms of are you going to make headway, yes or no? And what the message that comes out of that is decoupling, which was something when we came for the first time with this graph into the international negotiations.

We had a very interesting discussion with many of our developing country partners because when I started, and Joe, you remember that in the beginning, it was always you either develop your country or you reduce greenhouse gas emissions, that greenhouse gas emission reductions would always come with reducing economic activity. And that is just plainly not true. But people would only believe you when you can show it and it has actually happened. So transparency, very important.

But we can also go into finer granularity. For instance, we say, if you only take the Emissions Trading System in Europe and there is the big energy companies here in green and that's just the industry emissions, how they evolved over time. And you can plot it against what is the cap of the Emissions Trading System with ones up here.

And what you will see is that over the last years, emissions in Europe have always stayed below the cap. And that is one of the reasons why prices in Europe, carbon prices were very low. And one particular feature that came in from the Kyoto Protocol was the CDM credits which were allowed in faith to – in the system. And you can see here, that was the surplus that was building up and about three quarters of that surplus was imports in terms of CDM credits into the European system so that was helping to build up that surplus.

Now that we have and it was clear from these graphs to the policy makers that we need to address this issue, we can't go on like that because if we continue like that, we will have very low prices for very, very long and the price signal is not there to really innovate. So we created what's called a market stability reserve that is going to take as of 2019, so as of this year. These surplus certificates are not out of the market but it will reduce the amount of newly auctioned certificates that get into the market. So overall, the supply is going to go down. So very important to have this information to guide policy makers.

Participant: Sorry. Just to understand a bit the graph here, so this gap, how is that computed and does this graph mean that it's going to blow the cap then the certificates don't have much value because there are not many countries that will use more than ...?

Artur Runge-Metzger: It's kind of supply and demand. So in terms of demand for certificates, if your emissions are low, your demand is going to be low because you don't need them because you stay below the overall cap in the system. And what you build up is a surplus. You need to know also that the industrial sectors, they get a large amount of certificates still for free so they are not going to the market and buy it. So they will kind of accumulate that and that is what you see here in the surplus.

The other thing is that many of these companies not only kind of got these certificates for free but they thought that, "Oh, we can also buy very cheap CDM credits from abroad for half a dollar per ton so let's do that and give them," and comply with your targets or your cap under the Emissions Trading System. So you end up having kind of a huge amount of surplus that is sitting in the system, and that is depressing the market demand. And that is being addressed with now with this, what is called a Market Stability Reserve.

In the similar way and I don't think I have to go into more detail, we see this is kind of the target that we had in the sectors outside the Emissions Trading System. Again, you will see that here, there was a pretty big gap. But here, we have structured the legislation in a different way because we said, everything you had as a surplus, at the end of the period is going to be cancelled. So you do not have the same problem as under the Emissions Trading System and we were able to keep this feature also until the year 2030.

The reason why you have this gap here, one of the reasons of course, was the financial crisis that the emissions and the activity in the economy was going down. What we see at the moment is a picking up again and it gets closer to the trajectory. So we will get into some interesting times in the coming years.

We can also track progress per member state on where they are. So here for instance is the overhang of that little gap that you saw accumulated over time. So you see there are some who have ample headroom in terms of the emissions they had. If you look into the future and here it's calculated in a different way, you will see that in those years, they will overshoot that target. So here you see who is going to have problems in the future with their emission reductions. These are the good guys and these are the ones who will have trouble.

The same is true for the forests. We monitor and we see how overall kind of the line is going. We are in Europe sucking up more CO₂ from the forest than what is emitted into the air. But what we see is slightly declining over time. So there's also an issue we will have to see how that is going to go into the future particular also with the demand that is coming from renewable energy.

And we have started looking at the progress on how financial resources are being used. I spoke about the 20% target in terms of public spending. So we go through all the different funds that we are mastering and we are as a kind of taxonomy where you say, is that climate relative, yes or no? And you can see that in the beginning, we started with kind of 14% climate relevant funding and that then went up to around 20% for the coming period. After 2020, a new spending target will be set. That is something that is currently in the coal legislation process.

And we also do the same for the auction in revenues where member states have to report what are they going to use the money for. So here you can see this is what they use domestically for climate purposes and then the red ones is what's being used internationally because part of the money is also spent in developing countries in development cooperation so that's also being reported. So it's checking going further.

I spoke about the ...

Participant: One quick question. You are virtual on Brussels' spending.

Artur Runge-Metzger: This is Brussels' 2-year budget.

Participant: Do you track member state spending in the space at all?

Artur Runge-Metzger: No. We have no ...

Participant: International climate finance?

Artur Runge-Metzger: I know there are some member states who start doing that but it's not uniformed and it's something – it's hard to legislate on that side.

Participant: OK.

Artur Runge-Metzger: Subsidiarity.

Participant: Yup.

Artur Runge-Metzger: Internationally, this is kind of the EDGAR database so it dates back until the year 1970. It's really build on national accounts. An estimate here of this – the fossil fuel based CO₂ emissions. So it's all the major sectors that use CO₂ emission. This is the latest report you can see. Yes, emissions are growing and growing and growing until today. You can also see the major structural shifts in selected countries, China in particular, the enormous economic growth that we have seen and the emissions that were going up at the same time. But also, other countries kind of who are not able to bring down their emission over time as one would like to see.

So it gives you also a picture on OK, where are the different countries standing. It helps you to in the international negotiations to understand very often where countries are coming from.

But then I think there is a much more important step that needs to be done because everything I was showing you before was kind of descriptive statistics. It doesn't tell you cause and effect. And that is something where I think we need to become much more sophisticated in the coming years because we have seen, I listed, I don't know how many policies we have in Europe. It makes a huge bag of things. And some of that is overlapping like the renewables of course have an impact on the Emissions Trading System energy efficiency legislation.

So at the end of the day, I think one day people will ask, do you really need all these policies in order to accomplish what you want to accomplish or are they not yeah, reinforcing each other and duplicating each other and everything is done with huge administrative burden?

So you will have to look at the effectiveness and the efficiency of policies. And that is a difficult thing to do and to look at. I think what we now have in Europe is at least we have a database over many years and we have quite a huge variety of policies that are being tested in different member states. So in terms of the variation you have in the data, it's quite an interesting dataset.

But here's an example on where people try to say, OK, where would CO₂ emissions be if we would not have had those policies? And which policies have really contributed to that? So I'm not putting my fingers into the fire for this particular piece of analysis. What I'm saying, that is the type of analysis we require. These are I would say very static analysis still, not very dynamic.

Often, kind of what I find is they don't look for instance at how price is developed at the same time. So it's a little kind of OK, it's a before and after comparison. Before we had the policy and after. It's not really with and without, what we normally like as economists to look at. So it's a very interesting area that needs to I think to be further developed in the coming decade because one day politicians will ask us, is it really necessary that you want to have this particular policy?

So that's an open invitation to all the best brains in Harvard to put your brains to that. It can be done but it's not simple. We need good methodologies to develop.

And also, the other step we have taken of course is that all the data we collect from the past from the history and that is here kind of from n2005 to 2015, so that is kind of the historical. We use this as a basis to make our models forward in terms of what can we do into the future. And that is kind of the latest analysis trying to underpin how we could get to a net zero greenhouse gas emissions by the year 2050.

I don't have to go into detail. It's just to show how transparency and data, rich data, can help you to identify which sectors you can deal with, what types of technologies, and so on. And then take that forward and calibrate the two things, the modeling into the future with what has really happened in the past.

Now, coming to kind of the earth observation, the aim there with the higher resolution is to have really better data. And you can see that very simply here. This is kind of a satellite that has a relatively low resolution and that is one of the sentinels with a 20x20 meter resolution. It is taken at the same point in time and it looks at the extent of forest fires in vegetation in Africa. And you can see that in terms of the red dots, there is plenty more here than on the other side. So with a very low granularity, you underestimate. But here, you come closer to the reality. And all of that means there's a lot of CO₂ going into the atmosphere and it's something that we will have to address in one way or the others.

So again, if you want to create design policies with that type of information, you can start seeing, OK, where are the areas, the hot spots, in this case, real hot spots that you need to address in the future.

And the same is when you look at forest and how forest developed. So these are shifting calculation in the Colombian Amazon. The other side is selectively log forest in the Congo. You can see how these logs are being dragged out of the forest. And you will understand, OK, what does it mean to the land use pattern over time? Because what you will see is that if you have these in-roads into the forest, that is going to start to become very often agriculture land. And that of course has huge implications. And you can see that very early on.

In the international furor in the UNFCCC, we have been discussing about can we compensate countries for doing something about this problem? And this monitoring can help you to really establish have they done something, yes or no? And it's independently monitored. And this is something that is not done. OK. Brussels comes and then watches what you are doing. Now, we work with the government in order to bring this knowledge to them. All the data that come from the sentinels, you have free access to that. And it's everyday terabytes of data that come from the satellite but you will have to process them in order to make use of them, and that is what we do in many programs with the African countries.

Another example of cooperation when it comes to transparency is of course what we do on international carbon markets. And we see them coming up in many parts of the world here

signified in the United States, in the California, in the West Coast, you have them, the East Coast, and then also in China coming up with that. And they of course have shared the same issues as we had. You need to have a transparent system.

What is even more important for us is we dream still of linking different systems together. And for that, it is important that one ton of CO₂ is one tone of CO₂. And that depends very much on the monitoring, reporting, and verification system. If these are not compatible with each other, you will not be able to link up trading systems unless kind of you are going to create some kind of arbitrary trade because maybe you are monitoring reporting is completely different. You can have differences in terms of the scope of the Emissions Trading System whether you cover industry and which industries you cover and to what extent you cover energy, whether you take out the small installations or not.

But when it comes to the currency, the currency needs to be same. And therefore, we have been working particularly with China over the last years to help them to establish these monitoring systems. So kind of we normally give away for free our registry system which is a computer software that they can use in order to help pushing this forward. So that's very important for us to make sure that over time, we can expand. Again, transparency first is something that is so important if you want to battle the climate change.

And that's the end of my presentation.

Main takeaways. Transparency is the backbone. And what is quite interesting is sometimes people think this is the most boring part of the whole thing. But it's at the same time the most essential part of the whole system. And it is good domestically as well as internationally.

We have – despite the fact that we have the Paris Agreement, an enormous amount of work still to be done to make sure that what we have decided in Paris and last year in Katowice is really going to happen on the ground. Many developing countries are struggling with this. It's new. They are underresourced, understaffed so there will have to be good cooperation in the coming years to make sure that we will implement the Paris Agreement.

We have of course built our transparency system in Europe on the basis of the United Nation system but we have seen that if you really want to go into policy-making, it's not going to be sufficient. You have to go into much greater level of detail particularly when you deal with companies, particularly when you come with hard compliance where your data will have to stand up in court so that you can really fine companies if they do the wrong thing.

And as I said, in terms of the use of all the information that you gather, ample room for improvement in the coming years which can help to have better, more targeted, more tailored policy-making in different countries around the world.

Thanks.

Joe Aldy: Thank you.

[Applause]

Participant: Thank you. Thank you for an interesting presentation. My name is Ellen [0:57:42] [Indiscernible] from the Associate Professors of the University of [Indiscernible]. And I say that you can probably say lots of questions but just two, one comment and one question.

I was a bit puzzled by your comment that one day in the future it will become more focused on efficiency of the measures because that does happen. In the policies that have developed in those five years, it was much more focused on efficiency than it has been before. But now, the company that been the more clear – most clear on this is the UK, which is leaving the EU. So I'm not really sure I agree with you that you will have an increased focus on that now that France and Germany will be dominant actors and the UK is gone, which has had been kind of the main promoter of the ETS approach.

And then the second question, I had expected you to say a little bit more about the governance regulation, the new regulation that the EU now has adopted. And my impression so far is that it was – many fear that this regulation would really give more teeth to the commission but there is a sense of relief that now people expected to only read reporting and not be a very chorus of instruments. But what will you do now that the countries will submit their first draft for their action plans? And what will the commission do if you conclude that some of them are – how will you follow that up?

Artur Runge-Metzger: Yeah, I will happily say something about it. On the first one, in terms of the efficiency of the policy-making, I think everybody who has been in the field of policy-making and then you know that, OK, you make a proposal and you try to say, OK, this is a cost-efficient way of doing this. And then you go into a negotiation with consul and with parliament, there are many things that are being hooked on that. And I can give you an example.

When we look at our at least – minus 40% on the Paris Agreement, that in the modeling went well with 27% renewables and 27% energy efficiency. And then in the parliament in particular, it was like energy efficiency is like manor falling from heaven, so therefore we need to have more of that. So they were requesting even 40% energy efficiency improvement.

So in the end, they settled, council and parliament with 32.5. And the same on the renewable side, many were saying – and that is true in our assessment, the price assumptions for renewables were still a little bit on the high side while the real market particularly after we introduced the public procurement on the side of the renewables and bringing them in, it showed that how fast prices were coming down. So also there, the target was set higher.

So from an economist point of view, I would say, maybe that doesn't lead exactly to efficiency. Well, it's the way how the political process worked.

On the OK, is one member state better in terms of efficiency than others? I don't know. If you look at UK climate policies over the last 10 years, I think you have seen many changes to that moving forward, backward, and so on.

And also, that kind of you were mentioning the emissions trading, yes, the UK was one of the member states that introduced a minimum carbon price. But if you look at, OK, what's the overall effect of that minimum carbon price? There was none because you might reduce the supply in your own country but it doesn't mean that you changed the overall supply in the entire system. So kind of how rational was that?

And we have exactly the same question now with the quick coal phase out in Germany where you're saying, from a climate point of view, that might be necessary but from an economic efficiency point of view, of course, it will lead to less demand under the Emissions Trading System.

So the big question is, what is going to happen to these certificates that would have been auctioned? Are the Germans going to put them into the market or are they going to retire them? The legislation allows them to retire. So when you look at the analyst's comments at the moment, there's a huge speculation going around, are they going to really take it off the market? Will the Finance Minister allow that or does he want to go to the auction in order to have some income for it?

So in terms of yeah, who is really the champion of efficiency, I still think it's the Commission.

[Laughter]

Among the member states, very often, we have to look at this in terms of the politics in the different member state. On the governance, indeed, if you look at the national plans, we did not give ourselves kind of a big sledge hammer where to say, "Look, if your plan doesn't stand up to a reality of what needs to be done, we can go after you."

Still, what is most important is to engage them. And it's really, really interesting what is happening in Europe at the present point in time. The first observation is that when we were putting this proposal on the table, of course, everybody said, "I dare you. You come and look into my climate and energy policies," in the individual member states.

So they were trying to pull it off. Of course, we had a lot of support from the side of the parliament that was saying, "Yeah, there is a deficiency, but some member states are not having a good planning process." So kind of they were trying to hold off, hold off. In the end, they knew it would come.

And then there was a big discussion around when it's going to be submitted. So this date of submission was the 31st of 2012 – 31st of December 2018, so just a few months ago. And we had reckon that none of them has really done anything at all.

And I tell you today, we have 28 plans on our table. And what has happened in the member states is that in many member states, it's not the Climate Ministry that was the one coordinating these plans but it was the Ministry of Finance, the Ministry of Planning, the Ministry of Energy. So a very differently playing field I think in the different member states. So we have really brought ministries out of their silos in order to look at this overall plan because you have to look at all parts of the economy. You have to look at energy, industry, transport, everything, agriculture. There were two more.

Joe Aldy: So let me suggest this. We have bad news and good news. The bad news is we are out of time.

Artur Runge-Metzger: Yeah.

Joe Aldy: The good news is that Artur will be at the study group that [1:05:24] [Indiscernible], one of our Senior Fellows is hosting at 4:00 o'clock today in the MRCBG conference room on the 5th floor of Belfer Building. So if you want to continue the conversation with Artur, you are welcome to come then.

I would also like to announce that we will be meeting again in the seminar series on April 4th with *Karen Mills* [1:05:43] [Phonetic] who will be speaking about some of her latest research. She has a book coming out.

And finally, I'd like you to join me in thanking Artur his presentation today.

Artur Runge-Metzger: Thank you.

[Applause]

[End of transcript]