

## Topic 5b - International climate change policy, ECVs and UN COP

So it's very important to understand what's happening globally in order to find the local solutions. In particular, when we try to look at some aspect, some emission-- imagine the ozone layer and so on-- we need really a global observation system. And it's also important to go in through international cooperation aspects.

So we have to try to speak with our international partners, in particular those that have capacities either in satellite observation, but also those that have in situ capacities. Because again, I repeat, it's a mixing of in situ and satellite observations that are needed. Working at an international level will help us to try to understand the overall atmospheric composition of our planet and to try to solve some of the issues that are affecting our planet.

So we are working in this respect. We're already speaking with some potential partners. We are concluding agreements in order to access in situ capacities, but at the same time to see if we can create constellations together that can generate data that could be helpful for everyone.

It's very clear that society needs to reduce its greenhouse gas emissions. We've seen the recent report from the Intergovernmental Panel on Climate Change stresses the need and the difficulties associated with reaching a 1.5-degree future. In Europe, we have a lot of coordinated action taken at the European Union level to make sure that we contribute our fair share to reducing global greenhouse gases. This includes actions such as the Emissions Trading System, which particularly targets emissions of greenhouse gases from large industrial facilities.

There has been a step change in data recently, in terms of monitoring climate change impacts. This is being delivered by the Copernicus-related services. We've seen this particularly in areas such as impacts on sea level rise, ice cover, and also land use change.

We think the Copernicus services in the future will have an increasingly important role to play in monitoring the impacts of indirect greenhouse gas emissions from land use and land use change. This includes, for example, changes in deforestation, agricultural land practices, and forest cover-- all important aspects and parameters which we need to take into account in monitoring the emissions from land.

Policymakers are increasingly realizing the importance of co-benefits between greenhouse gas mitigation measures and air pollution. We've seen, for example, many measures put in place to reduce greenhouse gas emissions also lead to improvements in air quality and vice versa. For example, shifting to renewable energy not only reduces fossil fuel combustion, but also means that these same fuels do not emit hazardous air pollutants.

Satellite measurements are very suitable to monitor the impact of policies implemented by

the general political decisions. Like if you would have one or the other protocol banning a specific substance, we should be able to see immediately, and we do actually, how this banning has an influence on the pollution levels, or even on this individual substance. If there would be a policy, and there have been many, on reducing the NO<sub>2</sub> and NO from car exhaust, then we will see in the long run how this policy actually changes the smog levels and the NO<sub>2</sub> levels and also, actually, the ozone levels. And so we can see-- by having satellites in place which are measuring over a long time, we can really follow up the impacts of these kind of political decisions.

Economic situations can actually change very far, as we've seen or experienced in the 2008 economic crisis, for example. And there, we could very well spot how the change in the industrial output due to the crisis was directly linked to a change and then a reduction of NO<sub>2</sub> in terms of pollution. This is not only interesting because you can see this type of correlation, but this tells, also, the politicians that actually, if you would reduce your output at that amount, then you would directly reduce your emissions by that amount.

Tell me how the satellite data fed into the COP 21 process.

So basically, with satellite data, we can observe long-term trends on what's happening in the atmosphere, but also on the surface. So we have actually established worldwide the Global Climate Observing System, and GCOS defines which climate variables we should be monitoring. And with satellite data, we can today go for some variables almost 30 years back. And through those trends, we can actually really understand what is happening in our climate, and we can monitor where it's going.

Now, carbon dioxide, of course, is one of the most important ones, and just one station in Mauna Loa can show us how the carbon levels are increasing. But it's only with satellites where you can actually look at the whole globe in a consistent manner, and where you can understand what the regional changes are and the global changes are, and really to bring down and to try to understand what is caused by natural sources, and what is through anthropogenic emissions.

And so in the future, satellite data like this is going to be important for monitoring, because a policymaker, when they go back to their-- you know, they go to the conference, they have a lot of debate, a decision is made. Then they have to go back to their home country and justify that decision. How is satellite data going to be an important part of helping keep policies in place?

So in Europe, we are working quite hard now, today, on establishing a monitoring and verification system for carbon. And here, it's composed of many components. You have a modeling component, but you also have a ground-based component. But also importantly, you have a satellite-based component, because only satellites can see the whole globe in a consistent manner.

And that's what we really need. We need an integrated system to monitor this. So that's why we are working very closely with the European Commission and with the European Space Agency to establish what kind of observations can we provide from space to monitor carbon and to actually understand what is caused by carbon emissions from anthropogenic sources and what is natural variation.

Is this working? Is this getting better, that the policymakers and the scientists are talking to each other? Are you optimistic, is what I'm saying.

Yes, I'm definitely optimistic. I think we are coming a long way in most of the globe. And you look at-- many countries take climate change, air quality, and greenhouse gases, carbon emissions seriously. For instance, if you look at China, they are really working quite hard in order to bring their own improvements into place.

A thing, I think, that stands out from the satellite data is that you can trust people. If they say they are going to reduce their emissions and you measure the reduction, it helps global trust. Because it is all that global cooperation, isn't it?

It is, and that's the good thing about satellites, again. With our next generation satellites, the EPS-SG, for instance, for the polar orbiting satellites, but also MTG, we see everything across boundaries. There's no political boundaries in satellite data, and that is really what is really quite good about it. Compared to ground-based observations, which may be dictated by local rules and governance, we see everything. And from that point of view, open exchange of data is really the basis for trust.