

Topic 1c – Part 2: Supporting enterprise and innovative solutions - Monitoring clean energy innovations

Iolanda tell me first of all about your project ILMApilot, isn't it? Tell me what that is. Yes. So this project is a program funded by the Academy of Finland, which is the main funder for research in Finland. And this is a key funding project, so its aim is to utilize the results of the research, perhaps that you obtain in previous projects and to make it useful for Finnish society to serve Finnish users in a different types of applications. So you're connecting the satellite data to the businesses and companies that can make use of it in new ways?

so basically we are listening to what the user wants and making, producing a product and consulting basically the company or the authority or whatever the user might be on how to use satellite data, atmospheric composition in particular with the focus on air pollution monitoring from different sources. And what sort of examples have you got so far that we know where projects have got up and running? Well, the first user we got was the environmental authority in Helsinki. And they got you interested in looking at the level of NO₂. And especially in the trends, that's typically what actually in general our user are interested in, and see how, for example, the NO₂ level changes in time.

And this is possible when you have a satellite data that have long term measurements and consistent measurement throughout a long period of times. So they were interested in verifying if their action in reducing the emission, especially from traffic, really, so from cars in the city were working or not. And of course, they have their in situ data from the city, from the air quality stations. But they also appreciated the added value of the satellite data that provide more like a contest and a map - in a form of a map.

And usually what we provide as a product is actually maps of NO₂ in this case and the comparison between one year against the other to see if actually it's growing up and down. And we saw for example, in Helsinki, that the NO₂ level went down in the last 12 years. And you've got some maps to show what it looks like? Yeah, so what I was talking about-- so here is the comparison between satellite maps of tropospheric NO₂ columns in 2005 average various and in 2016. And so we see that the level of NO₂ in the troposphere is clearly reduced. These red high enhancement are not there almost anymore.

So this is an example of a local government wants to do something for its citizens. But you're also working with companies, aren't you? Yeah. Tell me something about the company projects you've got. Yeah, so there's a Finnish company that works in the clean tech sector. Actually Clean Techs is one of the main industrial sector in Finland. And so it's quite important to support their activities. It's important for the company because when they say to another customer that we have this product, and it does this, and the customer is wondering whether it's worth the money, they can say, we can prove it? Yeah, it's a-- the good thing about satellite is that there are objective information.

There's not much you can cheat about. So what the satellite sees is what is there. And so it is a strong marketing point if you want to sell a product to somebody.

All our power is just a small, really small share from my company. So we at the moment, unfortunately using mainly for self use, hard coal, and natural gas. But we are increasing renewables a lot, mainly in a form of biomass. The biggest reason is that we need a lot of heat. We are producing district heating. So we need it mainly winter time, naturally. And solar or wind are not that good during the winter. So biomass, it's really reliable during winter time. And where does the pressure-- so there's been a big change in Finland over the past few decades and where our energy comes from. How much has information that's available to the public been driving that?

I think the whole discussion about climate change has been impacting a lot. So people are now more aware that, OK, we should increase renewables due to climate change. And also we want to use our local resources from Finland. And we don't have any fossil fuel resources. So that's also one reason to increase renewables. And this monitoring technology so from satellites or from ground based stations, are you using that here? Because obviously solar panels are not producing any emissions, but other things might be. Do you use data to monitor how you're doing? We use data in the company. But we use mainly data from our power plants. So we can monitor continuously our emissions.

And then we know what we are causing. And if for example, our desulfurization plan is not working then we know that OK, there is a problem. We need to fix it. Because satellite data is then for us a bit old, old data, if we can see the situation at the moment. So you mean the satellite data takes a few hours? Even though it's quite quick, it still takes a few hours for it to be monitored and processed? Yeah. And you want to know now-- Yeah. --to turn something up-- Yeah. --or down? Even now this plant is producing. But winter time, when we have the biggest energy consumption, it's not producing at all or only a small amount.

It could be covered by snow during few winter months. So that's why we need sources that also there during when it's cold and which we can adjust based on consumption because solar we cannot adjust. It's adjusted. You get what you get. Yeah, exactly. And the same with wind. But then we have nuclear. We have hydro. Hydro is quite handy. You can choose that based on what you need. And tell me a little bit about this building behind us. That's Hanasaari Power Plant. It uses hard coal in its main fuel. But also we are using biomass in there, a small share of biomass. And it's combined heat and power plants. So we produce both district heat and power.

Coal is not a clean fuel. But you're trying to switch to biomass because of the difference in what they put into the atmosphere? Yeah, yeah. We are trying to switch from coal to renewables, or low carbon energy sources. And biomass is one option. But of course, they are emissions in both. And in these power plants, we are cleaning the emissions quite well. And now during these days, EU directives about the emissions, they are quite tight. And they are

getting tighter and tighter every day. So during the recent years, we have invested like millions of cleaning the emissions away. And that money is spent. That's having an effect. You can see it's having an effect.

We can see it's having an effect. Yeah, the emissions have decreased a lot.