

5 to 8 Minutes Introduction

- Collection of information about the interviewee (educational and technical background, field of professional experiences, professional years of experience, involvement in different types of projects).
- Brief introduction about the interview.

Interviewer

So let me start with the opening questions now. [Name of Interviewee 12], in your experience, what is the current level of knowledge in the building industry regarding the application of multifunctional façade components integrating solar cooling technologies?

Interviewee 12

For in the building industry, you say, so I think it's very poor and each party is focusing on their own part of the of the building construction and they don't want to be heavily involved in other technologies. Everybody is focusing on his own element which they have to build in the building.

Interviewer

OK. I see. OK, I got your point. So now in your opinion, what are the motivating factors for the application of multifunctional facade components integrating solar cooling technologies?

Interviewee 12

OK, so what is very important is that the façade building company, they would like to focus on efficiency. So they would like to install the frames and the glass and elements as soon as possible and they don't want to frustrate their operational process. So what is very important, in my opinion, is a kind of plug and play solution to relieve the facade building company because they see a lot of problems always because it could frustrate their operational process and something which they don't know they are not keen to implement on the site.

Interviewer

OK. But generally overall what are the drivers for the industry to develop products...

Interviewee 12

Idiot-proof. Plug and play.

Interviewer

OK. Now what are your concerns regarding the application of multifunctional facade components integrating solar cooling technologies?

Interviewee 12

OK. Malfunctions that somewhere in the preparation. Something went wrong. Something was wrong connected and that could easily happen because the experience and the knowledge of the installers is not that high because it's quite new. So the instructions from the supplier of the technology should be very, very clear. And not only that, but they should also....during the first projects, I would say they should also be on the side to help and to guide the installer. Not to make a mistake because there's a difference between theory and practical situations.

Interviewer

So to address the concerns related to the knowledge of installers, there should be clear instructions?

Interviewee 12

clear instructions. Yeah, clear instructions, but also assistance because there are many people involved....and only one should....Well, when only one person not understands very well, he can make mistakes with quite severe consequence.

Interviewer

So what do you mean by exactly the word assistance? Can you....?

Interviewee 12

Yeah. When the technology will be installed at the façade for the first projects....Because it's all new...For the building company it is new.... For the façade building companies, it is new....For the installers, it is new....Then I would say the supplier of the technology not only should say "OK this is the theoretic situation" but he should also be there and to have a look and to check if everything goes well.

Interviewer

So suppliers should be there?

Interviewee 12

Yeah. During the first or two projects and then you should be sure, OK, there's one guy or a team from the façade building company who understands...So the instructions and the guidance should be very clear.

Interviewer

OK. Now let me move to the following questions. So now how can the type of projects....So we have a new building construction or renovation projects. So how can the type of project such as new building construction or renovation projects influence the applicability of facade products integrating solar cooling technologies?

Interviewee 12

Yeah, I would say focus on sustainability and innovation. Finally the regulations also focus on net zero energy building, or zero energy buildings, or nearly zero energy buildings. So there's no way back. We need to implement these kind of technologies. If not, you won't get the building license.

So and that will also be the case in the next years because of the building regulations, it has to be nearly zero or net zero energy building. And then there's no other possibility then to integrate these kind of technologies.

Interviewer

So yeah, but so now I'm focusing about....we have a new building construction or renovation projects, so are there affect like for example....How do you see the effect on the application? For example to apply these technologies in new building construction or renovation projects. How do you see the differences between these projects?

Interviewee 12

Ohh yeah, I think the by implementing these kind of technologies, it makes a huge difference because you can control the HVAC system more in detail and it helps to contribute to a more sustainable building outside. And also related to BIPV, it's very important also to be as independent as possible to the grid so when you have your own power generation and maybe in the future also your own storage batteries and so on. I think this would all help to reduce the HVAC cost into a building.

Interviewer

OK, now OK, I'll move to the following questions. So we have different types of buildings. We have office buildings, residential buildings, healthcare, educational. So how can they building type influence the applicability of such façade products?

Interviewee 12

I think so in the future we are talking about smart readiness indicators. So what I think what will be very important....these smart readiness indicators because smart readiness, smart systems. I could, as I mentioned in a previous question, could contribute to a more sustainable building and to reduce the energy cost. So I think plug and play but also to control the electronics on a smart way. This could really help you to reduce the energy cost.

Interviewer

OK, now I'll move to the following question. So in your experience, how do the locations and the climate conditions of buildings affect the performance of façade products integrating solar cooling technologies?

Interviewee 12

Yeah, I think it's important...Also to consider of course the geographic situation. So where is the building located and what is the geographic situation of the specific facade. So you have to keep in mind, OK, are there trees or are there other apartments or high buildings which could influence the BIPV part or the solar part. So it's important to have a look at the whole picture. So what is the environment of the building and how does the environment....What is the impact of the environment on the building? Are there trees, for example, and things like that?

Interviewer

OK. Now so in general, which locations and the climate conditions would you suggest to apply such technologies?

Interviewee 12

Yeah, I would say so for the climate conditions, the West and the and the South facade should be provided with these kind of technologies because there....during the summer times and these cause of course the heat inside of the building....and what is also important....you should also keep in mind during the winter times, did you work with systems which also provides or enables to harvest the heat from the sun? So the light transmittance should also be considered because this contributes a lot to get free electricity, free heat, from the sun during the winter times. So when you have a kind of construction which helps you in the summer times to prevent to get the heat inside of the building, but that could be an disadvantage during the winter times.

Interviewer

I got your point now. I'll move to the last question in this part. So we have different types of solar cooling technologies. We have electrically driven or thermally driven. So do you think the choice of solar cooling technology, namely electrically driven or thermally driven, would affect the application of such facade products in a particular building project?

Interviewee 12

Yeah, business question, which maybe you can explain it more in detail because yeah, I think it always will influence.....I had the building....So could you be more specific?

Interviewer

Yeah. So for example we have different types of technologies.

Interviewee 12

Yes.

Interviewer

So how do you see the selection of a type technology, either we have electrically or thermally driven, how do the effect of selecting? Do you think that the selection of a technology, thermally driven or electrically driven can affect the application?

Interviewee 12

Yeah, I think I know what you mean. Yes, yes, of course, and the advantage of electrical driven technologies is that you can control it in detail, because you can connect it to the Internet of Things and smart domotica, KNX and systems like that. So yeah, I think it's very important.

Interviewer

OK, got it. So now I'll move to the key equations. So the key questions, I'll cover three main aspects. So I'll start with technical and product related aspects. Then I'll move to the financial aspects and then I'll ask questions about stakeholders and processes. So now I'll just start with the technical and product related aspects. Now in your opinion, what makes façade products integrating solar cooling technologies complex? What would make them complex? How people see it as complex products?

Interviewee 12

Yeah. Yes. The integration into the existing building methods, I would say. So a building company is used to build according to specific way and that's also the case for facade building companies and that's also the case for the installers. So a new product which not only contains glass for example, but also be BIPV, and then you have to deal with electronics into the facades and that is the main challenge to connect the electronics in the façade and to ensure that the wiring will be connected in the way it should be connected.

Interviewer

OK. So do you have something in mind....some ways how we can address these challenges?

Interviewee 12

Cooperation and collaboration with all partners during the previous stage, not at the end and that's what we often see at the end of the project. Everybody starts to realize ohh but we have this technology and how can we integrate it and then for example some installer work has already been done and then they notice oh it's too late to pull otherwise.....we know from practical situations.

Interviewer

OK. Now I will move to the following questions. So what are the potential solutions that can address challenges related to the space availability or interrupting other building services so when we integrate these technologies? Some technologies can maybe require some space, or they can interrupt other building services. Are there some way to address these challenges?

Interviewee 12

Yes. Yeah, it's the same, I would say so cooperation, collaboration and also transparency to the other partners who are involved in this specific building project. Everybody, yes, is protecting their own thing....and when you are open and transparent and say OK, this is what we need to do and this is our product and this is the advantage and this is the disadvantage and this you can do and this you cannot do.....That would already help them, but I think there's quite often there is some, yeah, people don't trust each other. They don't want to be really open. They think, OK, when I say too much, they can make abuse out of it. I don't know what it is, but the building industry is quite conservative, I would say.

Interviewer

So now I move to the following question. So what are the key aspects to consider for the maintenance and durability of facade products integrating solar cooling technologies?

Interviewee 12

Yeah, I already said, collaboration cooperation, but also maintenance contract and the last is very important I would say because it's not only the problem with the building companies or the companies who are involved with the construction of the building, but also the end user. When it comes to innovation and new products, some are quite often they fear that they think OK, I'm the first one who has this technology in my building. Ohh, what happened when it doesn't function anymore and when there is more function? So they would like to have, how to say, carefree or they want to be carefree and kind of maintenance contract could also help them. So when there is a malfunction, they only have to call a specific number and the problem will be solved, and I think that's quite crucial actually, because the early adapters when, OK, they....sometimes they take the risk but when there are more potential buyers, they.....They want to be convinced of....They want proven concept. They wanna proven technology.

Interviewer

I see. OK. Now I'll move to the following question. So how do you see the role of aesthetics in the widespread application of façade products integrating solar technologies?

Interviewee 12

Very important. I always use the example when you are a private person and you can express your image, for example with some clothes or to drive a specific car. But when you are a company and

when you claim to be an innovative company, or sustainable company and you can use your facade to express that that image.

Interviewer

I see. So what are the key aspects we need to consider for the aesthetics? To take into account your point. So what are the key aspects we maybe we should consider for aesthetics?

Interviewee 12

Yeah, yeah, It has to look innovative, and from a distance you should already see, OK, this is something different and this is sustainable and this is innovation, and yeah, it should also fit to the image of the of the company. What they would like to express.

Interviewer

OK, I see. So now I'm done with technical and product related aspects. Now I have just few questions about financial aspects. So [Name of Interviewee 12] in your experience, how can the industry develop affordable and financially feasible facade products integrating solar cooling technologies?

Interviewee 12

Yes, standardization and that is really a problem in Europe, at least. I know that in Scandinavian there are more standard sizes which will be implemented into buildings, and when you work with standard size, the industry is able to produce more in mass production and to reduce the production cost....and especially for BIPV, when you have different sizes, each size should be engineered and developed from the scratch because you need to calculate what is the output, what kind of optimizer do I need and it's quite expensive and it's also time consuming.

But when you work with standard sizes, yeah, you only have to do it once and it could also be that....yeah, when you look at the production capacity and when you have a gap in your production capacity and you...for example during Thursday and Friday there are no orders to produce, then you can fill this gap by producing the standard modules. Of course you have it on stock, but it could really help for the whole process, I would say.

Interviewer

I see. Now I'll move to the following question. So [Name of Interviewee 12], what are the potential financial incentives that can support the widespread application of solar cooling integrated facades?

Interviewee 12

Yeah, of course the first remark is subsidy, but not only subsidy. I would also say because people are really focusing on return on investment and that is what I don't understand. I understand for private persons, but I don't understand for buildings from the country, from the government or local authorities. Why is it required when you need a return on investment less than 10 years or 15 years....Because I really don't understand....Because I understand from financial perspective. But I also think that the government should give an example that is not a big thing that the return on investment could be 20 or even 25 years because from day one you already contribute to a more sustainable world. So when it comes to building products and everybody's is looking at return on investment. But I would say forget this from a certain perspective and focus on the win for the environment and for the world because as I said by starting the application it's already contributes to a more sustainable world from day one.

Interviewer

OK, but what type of subsidies you have in mind usually?

Interviewee 12

Yeah there is different....yeah it's always as we also saw with the electrical curtain and the solar panels had to help the introduction of a new product to the market and once is accepted by a lot of people, you can withdraw the subsidy and subsidy always helps. But I also think subsidy is important, but it's not the only thing. I think it's also important to convince the people that the return on investment is not that important because what is 20 years or 15 years.....As I mentioned from day one you already contribute to more sustainable world and this is what we are focusing on.

Interviewer

I see. So now [Name of Interviewee 12] I'm done with the first two categories. So I'm done with technical and product related and financial questions. Now I'll move to the last part which are questions about stakeholders and processes. So I'll start with the stakeholders and then I'll move to the processes. So as you can see from this chart, we have different stakeholders. You can see from this slide we have different stakeholders that are involved in the facade design and construction. So my question is: In your experience which of these stakeholders can support the application of solar cooling integrated facades?

Interviewee 12

Yeah, I would say the supplier, of course, of the control systems. The supplier of the engines. Supplier of the glass and also the supplier, of course, of the sun shades. So they really....when they work together, when they offer for example a kind of leasing construction or maintenance construction, or together they develop the plan to convince the other stakeholders that this new technology could actually work and contribute to a better building and more comfortable building. That's also something which we didn't mention. But it's not only the money, it's also the health and the comfort which will be improved in in these kind of buildings.

Interviewer

OK, got it. So now I'll move to the following question. How can we increase the knowledge and experience of architects and engineers regarding the technical aspects of integrating such technologies into building facades?

Interviewee 12

Yeah. Yeah, it's difficult. I have an example for integrated blinds. We from [*Specific Company Name*] already deliver for 20 years now. We've been delivering for 20 years integrated blinds into glass. And we actually did everything to convince the market and to convince architects....but we did everything to focus on the end consumer, but it remains very difficult. Yeah. For example, when we also invited the architects and some architects are open for the technology and then when they have a project they say "OK we would like to implement these integrated blinds into the project", but finally because everybody is focusing on reducing the primer investment cost and finally they say "OK we have to cut some cost" and then we cut this technology.

But it's really, yeah, how can I explain it more, but it's really a pity because when you look at the total cost of ownership, you will see that in the next years they will have more cost because the additional HVAC cost, but that's the problem. Everybody's focusing on reducing the building cost but

not on total cost of ownership and saving energy. But that is also which will change more in the future when people are obliged to apply these kind of materials because of the energy consumption.

Interviewer

OK. But how we can....Like for example architects working in offices or design firms....are there some ways to improve their technical knowledge about these technologies?

Interviewee 12

Yeah, webinars would help. Fairs. Demonstrations on fairs. Yeah, and also kind of corporationships, collaborationships, maintenance contracts. I think there's a huge opportunity for installers in the future and they used to focus on gas heating systems and traditional gas heating systems and things like that and they have any whole maintenance, but most of them they don't realize the huge opportunities of this kind of construction because they, as I mentioned the owner of the building, they yeah.....Maintenance contracts would help I would say. There's a huge opportunity for the installers.

Interviewer

OK, so now I'll move to the following question. If you'd like to have a standards or guidelines for architects or engineers related to the integration of solar cooling technologies, what are the key elements that should be in such standards or guidelines?

Interviewee 12

Yeah. Total cost of ownership.

Interviewer

Total cost of ownership. OK. Now I'll move to the following question. How can the industry increase the variety of products that would attract customers to apply solar cooling integrated facades?

Interviewee 12

I would say they need to....Let the market know that there are a lot of innovations. So they need to do some advertisement, they have to demonstrate their products at booths or trade fairs and something like that. They have to use the internet for advisement purposes and they have to visit architects and they have to....also do what is very important to integrate their technology in the existing databases. In the Netherlands we have the so-called BCRG database. So it's crucial that the technology should also integrate in this database. If not, you are not allowed to use it for new buildings. And of course the technology should be technically certified.

Interviewer

OK well how we can generally increase the interest of designers, developers and the clients about integrating these technologies?

Interviewee 12

I'll try to integrate requirements for sustainable buildings, but that will.....When the technology is proven, then when you can prove that it really contributes to a sustainable building. Yeah, then as I mentioned in the future, there's no other possibility then, if you will get a building license you need to implement these kind of technologies. If not, it won't be a zero energy building.

Interviewer

OK, now how can changes in building regulations affect the widespread application of solar cooling integrated facades?

Interviewee 12

That could really make a difference, and it will really make a difference. If it's not obliged, the building industry will do everything, anything not to implement it, because as I mentioned in the beginning of this conversation, it will frustrate the traditional operational process...And everything was new will.....There are many companies who are not open for new developments. They just want to do what they always did.

Interviewer

OK so building regulations.

Interviewee 12

Yeah, it's very important.

Interviewer

OK. What about changes in energy policies? So how can changes in energy policies...

Interviewee 12

That's a huge difference. So what we see now is....So the situation in Ukraine and the situation in each country. So people are starting in the politics are starting realizing, OK, it wasn't that clever to be that dependent on Russia. So from that perspective we see that countries won't be that dependent anymore in the future, so everybody's looking for their own possibilities and they are also, of course, looking now for sustainable energy sources.

But when you see locally....There is also what local happens even with buildings. If possible in the future, you should have energy neutral or maybe even energy positive building. And you can do that by implementing BIPV on the roof or on the facade by using energy storage system like for example a battery.

But there are also developments like vehicle-to-grid, things like that. Smart solutions. So I also think that small solutions, Internet of Things, could also contribute to this kind of thing. So final answer to the question, energy policies as independent as possible, I would say. So that counts for each building, but also for each country.

Interviewer

OK, got it. So now I'll move to the last part about the processes. So [Name of Interviewee 12], you know we have different processes in the facade design and construction. We have the design phase, production phase, assembly, operation phase and then we have the end of life. So now in your experience which phase is key for boosting the integration of solar cooling technologies into building facades?

Interviewee 12

Assembly phase. So the integration into the façade....When you can convince the other companies, all companies who are involved in the building of a specific....in the building of a specific....from a

specific building.....Yeah that is very important. So the installation part in the façade. When you can convince the other companies and the owner of the building that there's no risk and that you are confident to do so that you really make a change, and of course also what I already said because to reduce the cost, it is crucial to work with the standard sizes, if not it will be very expensive.

Interviewer

OK, OK, I see. Now I'll move to the following question. So let us start with the first phase. So [Name of Interviewee 12], what are the main aspects to consider during the design phase of solar cooling integrated facades?

Interviewee 12

I would say scalability and cost efficiency.

Interviewer

The first one...?

I haven't hear it... so...

Interviewee 12

Yeah, scalability, so if you.

Yeah, yeah. So the scalability is what I mean by scalability is the possibility to produce it in mass production.

Interviewer

OK.

And the second one?

Interviewee 12

Cost efficiency. Yeah because people are still focusing on reducing cost. Especially they want to reduce the total building cost. And what we see now is....everything is becoming more expensive. Metals, wood, glass, all kind of materials. Yeah the prices are increasing considerably and, yeah, I expect that we won't have the situation as far as before the war with quite some stable prices, I would say. So the first couple of years, I expect that that there are many things going on worldwide not only related to the war but also financial related, social related. So I think there's a lot of uncertain aspects in the market. Yeah, it could really be challenging times the next couple of years.

Interviewer

OK. cost efficiency. So what do you mean exactly by cost efficiency in the design face?

Interviewee 12

Yeah to reduce the cost as much as possible because people still focusing on reducing the primer building cost as much as possible, and it's also related to the to the financial situation, financial markets. So that's always the case and that will always be the case. Cost efficacy. And that not only to build the building but also people are starting to realize that the building also needs maintenance like a car also does. So normally people are not aware of that but now and certainly the bigger investors...they are also looking for total cost of ownership and they want to integrate smart

solutions. And yeah the technologies which we are talking about could also be connected to smart solutions.

Interviewer

OK, so now I'll move to the following question. So [Name of Interviewee 12], like this one you already talked about collaboration. So I need you to elaborate more if you can. So in your opinion, how can we achieve a closer collaboration between various stakeholders and disciplines during early design stages?

Interviewee 12

Yeah, I would say transparency of the of the cost and margins. So what we saw in the past that there are many companies involved for the construction of a specific building and we have a glass company, we have a company whose delivering the framework, company whose building the building....and, yeah, when we are open and transparent that we need, let's say 10 or 15% margin on our product, then that would help because what we saw in the past that some companies nearly got any margin and some companies got a huge margin from 30, 40, even 50%. And that's not fair, and yeah I think when we are transparent about the margins because everybody realized every company needs some margin to invest in innovation and to and yeah, to go on with the company, I would say so. So it's not a shame, but when you're open for that, that could really contribute.

Interviewer

OK. Transparency and cost margin. OK, so now I'll move to the uh following phase. So I already asked you about the design phase. So what are the key aspects to consider during the production phase of solar cooling integrated facades?

Interviewee 12

Yeah you should certainly implement a durability test, for example, but you already do for certification. But then finally when you have produced each element, you should test it and before you send it out of your production location, you should be 100% sure that it works. So it should be finally tested at the end and then you have to attach a kind of certificate one OK, this is approved and we approved it. So before we send it out, it is guaranteed that it works. So when in case there is a problem, you are sure that it was not caused by your own company, but it was caused during the installation of things like that. So that is important. I would also say gain as much as possible confidence and also when you realize some projects, you should have an interview with the owner of the building because these people can convince other potential customers to use the same technology.

Interviewer

OK, so take into account your point about installation, so what are the key aspects to consider for the assembly phase of solar cooling integrates facades?

Interviewee 12

I would say to train the people. Have clear guidelines and again to test it as much as possible.

Interviewer

Train people. You mean the installers or workforce?

Interviewee 12

Yes, yes, everybody also the production, the people on the production line, installers. Everybody who's directly or indirectly involved in the implementation of the technology.

Interviewer

OK, got it. Now what about the operation phase? What are the key aspects you need to consider for the operation phase?

Interviewee 12

I would say collaboration with the installers. So....and it could also be a kind of mutual product, I would say. So when you look at for example the integrated blinds, we deliver the integrated blinds. The facade building company, they implement the glass in their frames and at the same time the installer does the plug and play work in the facade and the installer could also provide the customer with a maintenance contract. So when there is a malfunction in the future, the owner of the building could contact the installer and they can solve the problem.

Interviewer

OK, so but also you were mentioning before the user. So what are the key aspects that we need to consider for the end user knowledge?

Interviewee 12

Yeah they need to know the possibilities of the technology. It would be a pity that after five years that they started to realize, OK, that option was also available and they didn't know, and I would also say it should be idiot-proof. For example we are developing heatable insulating glass, but we are focusing that it's not possible to activate the heatable glass when it's outside it's a temperature of 30 degrees. And sometimes they just press on a button and they don't know how to control the system. So therefore I also think it should be idiot-proof and it should be connected with sensors. When you have a sensor on top of the roof which measures the temperature, the wind speed, the light transmittance and so on....and it's also connected to the GPS and you know geographic situation and it can actually activate all kind of systems.

Interviewer

I see. OK. Now I'll move to the last question before the closing questions. So, [Name of Interviewee 12], what are the key aspects to consider for the end of life?

Interviewee 12

Yes, very, very important. During the whole development procedure, I would say, it is very important and even critical that you are continuously looking for not to use toxic materials. So you also have to keep in mind the recycling aspect of the technology. For example, there are supplies from the so-called [Specific Company Name], and it's... Cadmium is a toxic material. So how do you recycle this in the future? And I think some people are not really understanding the danger of the implementation of this kind of products but it's also something to consider. Yeah.

Interviewer

I see. OK, great. So you can see that I moved from design, production, assembly, operation and then we ended up with the end of life. So now I just finished all key questions. So now I'll move to the

closing questions. So [Name of Interviewee 12], do you have any final remarks about the widespread application of solar cooling integrated facades as building products in the construction market?

Interviewee 12

Yeah, OK, of course I'm working in the glass industry and as I mentioned before from the solar cooling technology, of course I'm aware of that. But from our perspective and it's really simple....So the skin of a building, and so to say the glass and the facade and it's a huge opportunity to tackle the problems at the source and what do I mean with that.....and then I speak related to our technologies. So it is my strong belief that by implementing solar systems and heatable systems into the glass that you can relieve or even it's not necessary to apply other systems into the building. So imagine as I mentioned before, when you use the screenline blinds in the outer space, you have a G value of about, let's say between 10 and 15%, so 10 or 15% of the heat will enter inside your building and when the sun is shining on the blinds. When you have internal solar systems that is already 50%, so then you already have 50% of the heat inside of your building. Of course, outside solar systems are better, but the maintenance costs of outside systems are much higher. And we have a very reliable brushless motorized system. And there is a company who did some calculations. And yeah, we have a lifetime of about 30 years and with integrated blinds and then we count that I think only 3% has to be exchanged within these 30 years. So that is that is, yeah, very interesting, I would say.

So my point is when you block the problem at the source, so when you prevent the heat to come inside of your building, you don't have to cool it anymore. And that's also the case of heatable glass. As I mentioned before, we are developing heatable glass, but heatable glass is not only a heating infrared heating element inside your building. Now the glass is still weakest point of your façade because during the cooler times, the winter times, that's the weakest point. But when you apply heatable glass, you turn the weakest point into a very strong point because it's not only heating the building but it's also blocking the cold at the source. So the cold won't enter into your building anymore. So the ideal combination is triple glass with integrated blinds and with heatable glass and in the future when you also apply transparent BIPV technologies and together with integrated blinds and even these transparent technologies are often bifacial. So imagine then you have you a triple combination. So triple advantage. So you have BIPV. You have heatable glass and you have a solar system and even with your BIPV. When you have high reflective blinds in the cavity, the other side of the bifacial cells will have a solar boost as well. So in winter times you can raise the blinds so then you can benefit as much as possible from the free energy of the sun, and in summer times you can, you have a nice system. You only have to need a ventilation system to get some fresh air in it. But I think with this implementation you have lots of possibilities.

Interviewer

Ok. So I'll moved to a different question. So in general, what do you think about the application of solar cooling integrated facades for enabling energy transition?

Interviewee 12

I think it's very interesting, but you have to look at each project is different and the mistake which a lot of suppliers make is that they only want to promote their own technology, but you have to go back to the user of the building and then you have to ask yourself the question. If I was the owner of the building, what should I do? And that is the main question. And then you have to look at all kind of possibilities and technologies. And I would say each building is unique and you have to look at all the possibilities and sometimes.....yeah it depends on the building. But related to solar, I would say you should get as much as possible each solar beam not only on the roof but also on the vertical

side. Each solar beam which you didn't catch, it's lost energy. But you also of course need to consider the cost because finally it has to be paid. But then you also have to consider the total cost of ownership and that could be beneficial in the future. Especially when the prices are rising. The energy prices probably will rise much more in the future.

Interviewer

I see. Now I finished with everything, but finally do you mind to propose potential participants that can be interviewed for this study.

Interviewee 12

What I would like to say is.....