

Tech & Academia @WorkplacePride @TU Delft, 15 February 2023 - “Diversity in the Built Environment” - Subtitles

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Good afternoon, everyone, and welcome to this visit to the Green Village of Workplace Pride, a combined event of Workplace Pride Tech and Workplace Pride Academia. Welcome also to the people watching at home and those in the room. I hear a slight echo, but I see that technicians are working on a solution. In the meantime, I'm doing a brief introduction. My name is Julien van Campen. I'm the chair of True U, which is the LHBTIQ+ employee resource group of the TU Delft.

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And together with Christine Holtkamp and with Martijn van den Tillaart I had the pleasure to organize this event. The theme of today's event will be diversity and inclusion within the built environment. So we have a very nice program that we have set up. I think for the other microphones it will be better if I just keep talking. I apologise for the inconvenience.

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And what I would like to discuss quickly before I give the floor to our speakers are some household announcements. First of all, should you have a question, the speakers will indicate when they would like questions for their presentations. But if you have a question, raise your hand and I will come to you with the microphone. This way it is also captured for the people at home.

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The people at home can ask questions using the Q&A function in Microsoft Teams. Please be aware that there is a two minute delay between the event happening here and the live stream that you see at home. So have a little bit of patience. We have somebody monitoring the Q&A all the time. And after that, we will just read out loud your question and it will be answered too.

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So before I begin, one other question: those of you who would not like to be photographed, because we have a photographer in the room, can you please raise your hand just to be sure? Okay. You do not want to be photographed? Oh, you do. But is there anyone who objects to being photographed. Yeah, okay.

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The gentleman in the back does not want to be in the pictures. Other than that, I would like to make a quick round in the room to see which organizations are present, and then I give the floor to David. So can you state from which organization you are? I'm Gretchen van 't Veen. I work for ASML, close by.

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Thanks. I will do this very quickly just to speed things up. ASML as well. Also ASML. Great. Moving on to the next table. Arcadis. TU Delft. Faculty of Architecture TU Delft. Thank you. Aliander, great company. Aliander. Aliander. Great. Rijkswaterstaat. The Ministry of the Interior and Kingdom Relations. Thank you.

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Workplace Pride. CWI. NWO. Elsevier. Elsevier. TU Delft. Tata Steel. Saxion. The police Academy. Saxion. ASML. Great. Thank you very much. So you can see that it's a very diverse group that we have present here today and I think I took long enough for this introduction. So once again, welcome to this event, and I would like to invite the first speaker, the diversity and inclusion officer of the TU Delft, David Keyson.

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Please give him a hand. Thank you. Thank you. And it's an honor to be here today and thanks to Julien, for the invitation to speak. I was told last minute it was in English, but I could manage that. No problem. Thank you. We're a relatively new group. I should probably say that I've been about two years in my function, and we've only had the office about one and a half years.

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So what I show today, keep that into account. So we are making inroads. We have a ways to go, but we're quite young, so one of our speakers last year at our last D&I week was Esther Mollema and I think she had a nice saying. She said, if you're not explicitly working on diversity, you are being exclusive. So it's something that we really have to be conscious and aware about and I see many examples in my everyday work of people who just aren't really trained in D&I, they are sometimes in the staff or leadership positions, different positions, and they just don't have the skill set to even take on diversity.

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So we have a long ways to go as a as an academic community and to learn from each other. I think that was a good saying. And I think also if we aren't intersectional, some of us, the most vulnerable are going to fall through the cracks. So I think also we tend to be kind of black and white.

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We have women or men, but that's a very simple way of looking at the world. So it's also not only thinking about, we're very much working hard at the TU Delft to also see that women can progress in academia. Here we have in some of the faculties a relatively low percentages, also students. But then again, as people often think, oh, the female, that's a stereotype white female, Western person, and that's obviously not the case.

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So it's also thinking about diversity throughout and intersectionality. We have some core missions from the TU Delft. We have a thing that's called DIRECT. And so we do have things like respect and diversity. We are missing some understandings like belongingness and inclusion, but you can kind of bring them in as part of the mission.

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So we talk about EDI So it's equity, diversity and inclusion, and equity is more about providing equal chances. So equality is more about the percentages and equity is about providing equal opportunities. So we, we call it the D&I office, but it's really also about creating equity in the system.

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It's really about respecting individual differences. People can feel at home, feel safe and reach their full potential and really kind of flourish in the organization. So that's what we're all about, realizing that. I think there's three important components. I won't read all this text. You can find this surely on our website. We'll be updating it with this new narrative as well.

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But I think it's a moral duty to work to work on D&I. And that's also in terms of our society, we should reflect the society, the diversity, the society here at the university on our campus. But even more so, it really enriches innovation. There's a lot of research also on diversity. There's a famous study in the journal Nature where they've looked at millions of publications and they saw authorship with different diverse people, with different backgrounds.

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They just based it on their names, but they had much a higher citation rate. But we also know that diversity in teams brings in new perspectives, innovation. So it's really important to bring people together. And if we're talking about the built environment now, it's really about also enriching the built environment so that it serves different kinds of needs.

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And we're really not only educating engineers and designers here on campus and scientists, but we're also educating people. And we were trying to equip our students with the tools to come out, go out in the real world and integrate in society and deal with diversity in society. So it's also important for our future educational goals. Now, I think one of the interesting notions is we talk about inclusion, but we could also talk about expansion, and this is just a little kind of cartoon.

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So you see equity here. Everybody has an equal ladder. They can all stand and look at the field as equality, right? They all have the same ladder. And they all got into the playground and they're on the same ladder to watch the baseball game. Equity: now they can all see it, so they are equal in terms of their opportunity.

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But then we could talk more about expansion or liberation. So why not just take away the barriers altogether? And so I think that I actually like the word expansion more than the word inclusion,

because we're trying to expand our system in order to make it more embracing. And it's not that people should have to adapt, but the system should adapt to the people.

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And then also, of course, the people in the system have to get along and adapt with each other, of course, but the system itself has to expand. So it's an important point. So we have our team. These are some of the people in our in our team. We also have different roles, different policymakers. We have students in the group as well, and we also have a governance model in our D&I office.

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So we have in each of the faculties and organizations like True U and Delft Women in Science, also in several of the business units, they call them Dienst in Dutch, service units, corporate offices. So all the faculties also have diversity officers as well. And they're in this board. So we have a big network and we meet about once every two months and we also engage a lot in training.

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So we're also working now on upcoming training on open communication. How do you create a safe dialog? Because it's one of the big challenges that this university is also how do you get through some of the kind of hierarchical natural barriers that you find in the academic world, that you feel you could express yourself without shame and blaming?

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We also have, for example, a training coming up on neurodiversity, because how do you communicate and deal and interact with people with neurodiversity, that you can understand each other and build a bridge. So we're working on those kinds of trainings as well. We have kind of a landscape model. So you can see the different pathways that influence

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D&I, I hope the letters are big enough on the screen. We have one blank pathway, so we could still fill it in. We suggest we have all the pathways. So these are all mechanisms which we can use to influence D&I culture and policy. And we recognize four target areas. So we have the students, we have the staff, education and our research and valorization work as well.

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In fact, one of the new programs we're starting now with NWO funding is on inclusive innovation and research. So how do you in fact create inclusive design teams, people with different backgrounds? How do you manage those differences? Also work on a result which can also maybe serve a less common, let's say, not a mainstream population, but also different kinds of groups, diverse groups.

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So really thinking about how do you manage diversity in teams with people of different backgrounds, different perspectives, and from a methodological viewpoint, developing those methodologies. So these are some of the key topics that I mentioned, some of them were on

academic staff. We're working very hard to increase our student population diversity. Our average student tends to be a white male on campus here.

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So we want to have more diversity. Also, in terms of background, one of the biggest challenges here is we know that only about 2% of students, let's say with a migrant background, follow an NT profile in high school. So the problem goes back to the elementary school. So we're now starting a program to reach out to elementary schools to change the whole system because often students in elementary school don't have exposure and opportunity to even get engaged in the sciences.

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And sometimes also the families, the parents can say, well, your great student, go study medicine or law and well, engineering is... you get your hands kind of dirty and oily and I'll stay away from that. So that's also some of the cultural values there. So to change our student population

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we have to go way back in the pipeline. We also have our Science Center which has open curriculum, open education, and some of the teachers also in the schools can follow lessons and get more involved and we can supplement some of the educational material as well because there's also a problem in the schools as well. So a big challenge ahead is also on gender registration right now, as you probably know, if you get registered in the Dutch system, you're either male or female, nothing else.

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And also for students, it's sometimes very difficult because they might go through a gender change during their studies and the diploma doesn't match their name anymore. So we're also trying to create a system as a national challenge. We're working together in LanDO, that's a network of diversity officers in Holland to see if we can create registration systems, that we can actually change the name of the student in the TU Delft so that it comes out correct on their records and their diplomas, even though it's not the same.

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So we're trying to find solutions. We have a lot of different kinds of opportunities. We have also a diversity grant so we can provide students and in the coming year also staff with different opportunities. For example, one of the projects we have is at the Faculty of Architecture. So it's a pop up contemplation center because we are building five on campus.

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But this is like a fast blow up contemplation room that can serve both students who are in need of a quiet space, but also other students like Muslim students who might need a prayer space. So we are working on those kinds of facilities. We also have a plan where all buildings will have gender neutral toilets, so we have a master plan.

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The library is the first that already has that service, but we're working on all the buildings will be adapted. So we're also working on facility things. Training is a big part. I mentioned that already, but we're also reaching out more with HR developing programs with different faculties and also monitoring. We do a lot of surveys, staff surveys. We have student survey running, so we're also trying to see where different challenges exist in terms of diversity and inclusion on campus.

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We do have now, I'm happy to say, the Progress Flag now hanging at the aula, so we updated the Rainbow Flag with the Progress Flag and we celebrate Purple Friday here. We have different events: coming out day etc. So we have now also the inclusion calendar that's on our D&I website. So you can see all the different holidays, festivities and things.

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So that's also part of creating a more inclusive campus. I mentioned already we're working on the name registration but also also teaching people about pronouns, registration, creating more discourse, creating allyships and continually monitoring the needs of the LGBT community on campus, which we're very proud of. So that concludes my talk.

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I don't know if there's time for questions, but you're welcome to ask questions as well. Thank you. I think there is some time for questions. So are there any questions in room? Yes. One question. So you obviously have quite a track record, I would say, of what you're currently doing. What could you advise to maybe to some of us here who are just starting this journey on how you started it all up.

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So what were your first priority items and which were the things you only developed in a later stage? Yeah, I think the most important thing is to have discussions and talk with people to build a network organization. So try to create people in different, because things like survey and data analysis takes time and if you want to get a jump start

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the best way is not to try to do it on your own because it's too much, you'll never manage. But to create a network around you and build up a model with people who can really bring the insights and then create as much as you can local communities and foster those communities also to create some financial if you can, if you can pull funding together to create some funding so you can create some grassroot actions and then slowly you'll develop the policies and formal governance models.

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But you can start kind of bottom up that way. Are there any more questions? I was wondering if the trainings that you are offering, if you will make them compulsory for people in certain positions because it's quite a hierarchical system of course. And I know quite a lot of

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woman friends that are doing their PhDs who are struggling with a cis hetero white men professor in this regard. And I think it would help if they would be forced to take a training rather than that a female PhD student, has to suggest it. So we see faculties like TBM for example, now they are doing required training for all people in leadership functions, so they're doing an unconscious bias training and observer training.

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So there we see the dean being really very proactive. And I think I've had discussions with all the deans and they're very supportive and really want to introduce and bring in training. And I think an important point is not only training the leadership and the management, but also training the people on the floor because it's a two way communication.

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And it's easy to point the finger and say, oh, the management is the leadership, it's also the people. And also what I said about creating a safe space where you could speak out because, I was telling Julien, I was a bit late here today because I had a colleague in tears coming to me. And it's so important that people dare to speak up and say speak out.

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And actually that's one of the biggest obstacles. And then if you're not satisfied with what you hear, then you go up to the next level and you go up to the next level. And I can assure you that the the problem isn't at the higher level, it's often in the middle somewhere

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in the sandwich. There's problems. But once you get out of that level, so you have to also kind of understand how the system works in a way. We are in need of communication skills. It's very much lacking now. Okay. You have a question. Yeah. Last question because it's time, we need to move on.

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I'm curious to know how did you become so involved in this subject, as a role model? Yeah. Yeah. I look like a white male, but I myself am Jewish, so I'm probably one of the more persecuted people on this planet if you look at our history. So I am a minority, although I don't look like one, I have darker hair.

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But I do inside feel like one. And I've lived in four different countries and different cultures. So I started off in social science before I went more into human factors engineering. So I have a background back then and honestly, I've reached a point in my career, I'm, you know, let's say I'm a senior professor, whatever.

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I don't even use my title anymore, but I am. And so I don't need to make career anymore. You know, I've done that already. And now I think I'm at a point where I want to give something back also to

the community so it's all on my heart. There's no extra gain for me or say, compensation or anything.

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I just do this because I really believe in it. And it gives you a good feeling. And it's also really exciting and nice. It's positive. It's really great to meet people. I have much more awareness of the TU Delft campus and we see each faculty has their own kind of culture too. There's really differences. So it's also interesting.

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So it's really enjoyable and I also have a team which I built up and I really believe strongly that I can self-empowerment, giving people the not hierarchical and flat. And so I also get a chance in our little group to kind of practice what I believe in, and that works. So I'm happy with that as well.

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Just on a personal level, thanks. Thank you. That's a great answer. As already indicated, we need to move on. Let's thank David one more time. Thank you. And then our next speaker is going to be Dirk van Den Heuvel, who is going to give us a presentation on queering architecture. David, thank you so much for the introduction because I came back to the university as a PhD student in 2000 and it was the moment that women emancipation was transformed into diversity policies.

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And I thought as a gay person, Oh, that's interesting, because then I can join. So I called someone in the office and I expressed my interest, and then it was silent because I said, well, it would be very nice to bring gay issues and all that. And it was silent. And they said, Well, I don't think that TU Delft is ready for that yet.

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And this was in 2000, you know. So now we're in 2022. This is a very different situation and it's amazing to see what sort of policies are now being implemented and I'm happy to see that change and be part of it together with Leon who is sitting there. We we sat at some points around 2015 to discuss our annoyances, irritations with the situation, and Anke Mulder was here at the time at the board and said, well you should start True U Delft.

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And that's for us how it started an through all sorts of conversations, etc. I think it's amazing to see how it has broadened and how we are moving on. I'm really happy, change can happen. So this is one of the things that I'm really proud of. I am teaching in the faculty of architecture.

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I'm the head of the group architecture and dwelling. And next to starting little campaigns and actions with the True U Delft. I also thought it has to change on the work floor and in the education situation. Architecture and dwelling are relatively easy topics to queer the curriculum or queer education. So I started to ask the students and the staff also to think of who is actually living there in the housing that you build.

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It's not just an anonymous sort of person who's living there or a nuclear family. It has become much more complicated, and this was more or less implicit always, who is that user? There was one session and we had bachelor students putting up all their housing projects in Amsterdam West. They were obliged to do a user profile research, and much to my astonishment, with hundreds of plans there, they were almost all hetero couples, migrant families.

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There was one student who dared to think of a lesbian couple, so I just blurted out: where is a nice gay couple living in Amsterdam? So there was a gap of a who you built for, who you design for, who you are trained for, who the people really are.

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And to think of how design has to interact, respond to how people live. And it's not just gay lifestyles or lesbian lifestyles or queer lifestyles. There are rainbow families. There are broken families, multigenerational ways of living together, etc. It was fairly easy to bring that change just by making it explicit. And the next step for me was to also dive into the research.

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This came out only last month, Queering Architecture, a book with Bloomsbury, with international authors. And I also contributed to it because I thought it can also be part of my own research portfolio, so to speak, to discuss in another way architecture and to think in another way about design. We did before an issue of the Footprint journal, a peer reviewed journal from Delft, Delft architecture theory journal, trans bodies, queering spaces. This goes even back to 2017, which was not so easy to develop.

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But I'm glad that we did it. And there's a kind of motor being set in motion and I hope it will continue. So what I want to do now is to give you a little 'college' about queer architecture, queering architecture, because I started to dig into the archives, into literature. What are the traces?

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What are the possibilities to actually develop and to rethink architecture and what architects do. How long do I have? Okay. Oh, that's serious. But I brought enough materials. So on this image, you already see the difference in approach. So this is a classic welfare state diagram for who planners and architects work. It is by a famous female planner.

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Lotte Stam-Beese for Rotterdam. You see big families, a nuclear family. Family without children., only one child, elderly and single persons. That's the limit of lifestyles that you had in the fifties, or at least the limit of lifestyles that the planners were thinking of. And this is by an artist architect, Andreas Angelidakis.

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So it's a bit provocative image, of course, to make the contrast as big as possible. Who is a queer artist architect, and this is a kind of vision for a new sort of a studio space for other lifestyles, but clearly you can already see that moving back into history, there are tons of traces for queer lifestyles.

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In the nineties there was a first wave of studies into this topic. What is Queer Space? What can it be? By Aaron Belsky, who also became the director of the Architecture Institute in Rotterdam, and this guy Joel Sanders, he edited this, at least a cover is very provocative. The architect as some sort fierce, muscular god or hero.

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Architects of masculinity. This was mid-nineties and was almost like a coming out for architecture. There are other ways of looking at architecture than through a heteronormative lens. Joel moved on, because this is the moment that queer space, and it is now criticized, queer space actually is, as described here, way too much the white gay male from New York, because these guys, Aaron and Joel, both were living in New York and Joel developed a whole sort of research into gender inclusive toilets.

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As he said, not gender neutral but gender inclusive. With a trans artist. And we invite him also over to Delft to talk about how so-called non compliant bodies, how they are treated in space. So not just a normalized body which has a certain size and is healthy, etc., but people also in wheelchairs, people who don't identify as either male or female, and also mothers with young children, how to accommodate them in space in architecture.

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So fantastic projects on inclusive of toilets. Very sensitive. Another pioneers, Henry Urbach. He died unfortunately very young. He looked into the topic of the closets. Coming out of the closet immediately explains why there is a relationship between architecture space and thinking of hidden identities and hidden stories. I'm an architect.

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These are the closets and these closets, of course, are often overlooked, but anything that's put in the closet is goes there for a reason to make the other space operable, to hide and to cover up is in function of a certain system and to get things out of the closet, to make them visible is part of the transformation, even disruption of that system, I would say.

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And that system, it's not just the way we are in the university, but is the system of spaces, of houses, of cities. This is the core claim for queer studies in architecture. There's tons of examples of safe spaces in architecture history. This is a famous example of Horace Gifford's Fire Island, close to New York, where we will see a lot of gay male houses because they have more money than lesbians or trans people.

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I will talk a little bit about it later. David already mentioned intersectionality. This is one of the methods to further develop this story and indeed expand this notion of inclusivity and diversity. So it's beautiful architecture, it's much loft, it's modern, it's very hardcore, modern architecture. So queer architecture or queer space is not related to one style, some people will say that some forms of architecture are feminine and others are masculine, but what you'll see is that in relation to the users and the clients and the designers and how they identify,

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there are tons of different meanings and values attached to it. A very well known example, also the Bloomsbury group in London, with artists and writers like Virginia Woolf, but also the famous economist John Maynard Keynes. The example of Derek Jarman, for instance, the filmmaker and artist who created a very special place, a kind of refuge almost out of the city with a special garden close to the sea.

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And there's this guy, Philip Johnson. He's very important in the history of modern architecture. He was a curator at the MoMA, Museum of Modern Art, and an architect himself. But he's also it's a dangerous person. In the thirties, he was supporting the nazis, a fascist. And after the war, he would reinvent himself as a supporter of democratic values.

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But here you see this architecture, a glass house about transparency, functionality, hard surfaces. And this became a kind of safe space for gay New York and gay architects, for instance, Andy Warhol, Philip Johnson himself was also an art collector and contributed his whole collection to the MoMA. And what was special about him is even though he was definitely a rightwing person, he was out because he was so rich that no one could touch him.

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And in that sense he became also an activist. So you get all sorts of combination when you go through the history and traces of persons in biographies, how people navigate the obstacles of having a different lifestyle, a deviant noncompliant lifestyle and love, right? It's simply about who you want to be with and who you want to have in a relationship.

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As I said, there are very few female examples, lesbian examples. I also work at the New Institute in Rotterdam, which was the Architecture Institute, and we have the national collection of architecture there, and we queer the collection, as we say. So we organize queer salons and other sort of interventions with artists, people from outside architecture looking for those hidden stories.

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And then we do find some examples who can be both an insider and an outsider. I will end with a few of those examples. Very beautiful houses and interiors and very few female designs. So already in our collection, which is about 700 dossiers, 700 archives, mostly author based, and most of them are male authored. It's up to 10 to 20 female authored dossiers in a whole collection of 700 dossiers.

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And then they are often couples with a husband and wife, office or practice. There's only one we identified. It's a bit silly to identify those people, but it's the only way to try and work this visibility strategy. So Riek Bakker, who is an urban designer, and she's famous for her policies in Rotterdam. She's out and proud lesbian also often

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in Rotterdam, but we only have a few items of her work. But other than that it's not there. So speaking of intersectionality, we're going to organize a salon on queer and crip to see what's happening there, or black and queer, also in relation to our archive. And it's a tough method because it's almost self-defeating because you bring out what is not there, the absences and

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what we want to do is that from those absences that we can start working on different ways of creating an inclusive environment in the institute and in our work. So I show here Eileen Gray, Irish French architect, she's a heroine of modernism, two books that look at her work try to also rethink modern architecture and avant garde architecture.

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Here she is with a very classy photo, a beautiful little house. At the mediterranean coast in France. And there's always little fights and contestations in these histories because she was also involved with a guy. But she's more or less also appropriated by, especially with Jasmine's book, Eileen Gray and the Design of Sapphic Modernity.

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She was in Paris a well-known guest in the lesbian salons there. And so with this autobiographical background, she's a lesbian icon and beautiful stuff. You can still buy the furniture. It's a luxury modernist design. And one of the things I want to bring here in terms of safe spaces. This is architecture.

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You look at a plan and how the plan controls the spaces. For outsiders of architecture, plans are often very hard to read. But the core tenets of modernism, this new avant garde is a kind of legacy of modernism, it's about transparency, looking out, it's immediate relationship with the outside, inside, outside.

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Almost no obstacles there. But scholars of the work of Eileen Gray, but also other queer designers show how this transparency idea and the idea of unhindered connections is replaced by a continuous negotiation. Who controls the space and how the space is safe for another way of life. So here you see this invisibility. You control who can look in and how to look out and

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this is maybe for the students. Here you see how the stairs work and the doors work and they work also like a closet. So when one door opens, you see that one connection is blocked, etc. And you never, ever get to enter the main space, just like that, as you do here. There is always a series of thresholds and filters before you really enter the center space and the space of privacy, which is

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very lush, modernist. And you could say even with all the beds and luxury materials, a very erotic kind of scenography. A very different approach is in postmodern architecture, which embraces crazy forms, which thinks of eclecticism as very important, ornaments come back. And this is the first time that a historian acknowledges a gay kind of undercurrent.

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So until then, it's really not mentioned at all. And Charles Jencks mentions it here and there, but really briefly. He doesn't theorize it and you get things like this. Charles Moore, very theatrical. This is in Minneapolis, in America. He created also this kind of interiors, but this is with a graphic designer. It's very colorful, very bright away from the modernism.

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But again with all sorts of different ways of connecting spaces and controlling spaces, this was also his private home away from the city. So again, a kind of safe space for him. He moved to Amsterdam, to the Netherlands. This was the space of Frans Haks, the director of the Groninger Museum. A 'relnicht' you say in Dutch, a very expressive, articulated person who made sure that the Groninger Museum, designed by Mendini, got built.

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But here he lived with his partner after he retired. And you can already tell this this is the entry of their house. This is not just a very careful masking filtering. No, it's very obviously, this is a closed off space. You don't enter just like that You cannot look inside. Only when the door opens, you get a little peek, a view inside.

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And this is then his little temple. Very bright, very colorful. Mendini, who designed this museum, I think you know it. It's a fantastic place to go. It was a present for Frans Haks to design these spaces. It's over the top, with a bathtub in the middle, etc. So it's not anymore this sophisticated modernism, but in-your-face.

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It's now a monument. The interior is listed as a monument. And it was bought by an American couple who loved it. And here you see again plans. This is the street space. And here you see, there's very thick sort of zone that you have to penetrate before you come inside. And here are some of the drawings of Mendini. The theatrical mask or facade, the closing off of that interior.

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And here you have that very theatrical space with the stairs here. But there's also a sneaky stairs here next to it, moving up to a much more normal space where he lived with his partner. So it's also

a double fate sort of house. And it's very different from the classic welfare state and nuclear family house or the 'doorzonwoning'.

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It's not like that at all. The two entry space entry is one of the classic tricks to create a very different sort of way of living there. And here you see these sections. So this is downstairs with all sorts of theatrical lighting. And here you go up to the more normal space. Someone you also may know is Benno Premesela. A designer and an activist, one of the founders of the COC, with his partner, Friso Broeksma, who was an architect, also teaching here in Delft.

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He also created this safe space in this house, the Keizersgracht, and again, there's a kind of scenography or a threshold before you come in. So you had to walk across this art piece by Carl Andre, so inside there's a moment, there's a ritual there and then you go up the stairs before you enter this special space, which is like a little temple for modernist design, which was also like a salon where all sorts of friends and colleagues would come together.

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And Benno and Friso would host all sorts of guests. Actually, the Jewish Museum put up a whole interesting exhibition on his work at the time. Now three ones from the archive in Rotterdam. This is Onno Greiner, a theater architect. Very successful, and he was open about his homosexuality, but he talked about his struggles with his father, etc..

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And he created this house, a patio house, which is very private. And I tried to explain why it's so different because I mentioned the 'doorzonwoning', the row house. And it's a very Dutch tradition to have your front door straight to the street. In Paris or Berlin or other places

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there's all sorts of different ways of living in a city. But in the Netherlands, the front door at the street is very important. And this cluster of patio houses, it's a very different relationship to the public street. So all sorts of social control disappear and the cluster is made in such a way that you cannot even recognize the individual house and you cannot really recognize where the entry is.

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He had a younger partner who lives there still and he told us, I went there with one of my colleagues. It was his way of living there, allowed him and Onno a certain privacy there, because no one could look inside. In Amsterdam, just outside Amsterdam. The other one I like to show is Wim den Boon. He's the most anarchist one.

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'De Keurige Leugens van het Officieel Fatsoen'. He really like to go against the grain and he created a whole sort of, he was a single person, a very colorful life. Maybe he should have a biography or something. He dressed up in leather, fancy outfits, etc. Also to more or less, not to shock, but

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to create his own space. And he loved to travel in Europe and hike and he embraced nudism. So in the photo album, you also get to see him. I have no idea why he did that. We don't know. But in these photos he becomes really his own person. Because you could say his career did not come off the ground because of his different way of life and his uncompromising way of life.

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But he did a few very experimental houses that we have in the archives that are very unlike anything else that modernist or functionalist housing in the Netherlands has. So as you remember, the first image with the diagram who should go where, in the fifties, maybe up to the seventies, functionalism was very strong in the Netherlands. And to think of architecture as a space to experiment, to come up with a narrow house, as in this case, or other kind of houses,

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it's a set of like a dozen houses, in the sixties is quite unique, and it's an autobiographical house because you can see there's a sports car. He loves sports cars, there's a canoe, he loved canoeing, etc. And again, there's a kind of labyrinth that creates a safe space for him and that creates interior spaces inside interior spaces.

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So how you move through it and how this space is then enveloped by other spaces is very typical of this approach. Beautiful drawings. Definitely not a family house with children. Beautiful models. A holiday home. And here you see very clearly how it's closed off to the outside.

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And there's an idea about interior that also has a different material and surface treatment. The last person, a mysterious guy. Dick van Woerkom who was an architect, but also founder of our collection. He was into art and De Stijl in the fifties and sixties. He died in the eighties and he worked with someone called Baljeu, an artist. Beautiful sculptural things.

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So he used the sculpture. Um, the model is done by Baljeu and the drawing is by Dick van Woerkom. And he too, also engaged in very experimental sort of spatial constructions and fictional houses. So this is a house for a special friend, Frank den Oudsten. And he created a kind of what was called paper architecture, a kind of space of freedom for architecture and architects outside building practice.

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These two plans looks very much alike. It is very funny. So you look for traces, what could be queer, what could be gay? So this says 'woonhuis voor een gemiddeld gezin, m/v, twee kinderen', so a house for an ordinary family. Male, female, two kids, and you see the four bedrooms.

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It's not quite ordinary because there you have all these bathrooms. And then the other one, it's the same plan and then it says a house for an art collector. And the moment you come across these signs, an art collector or a musician or artist, you know something else is happening. So you get to know all these little signs that, oh, we're moving aside from the path and we come into something else that is not really explicit and you see this becomes a guest room or I don't know what, but definitely not a nuclear family. And then he has all these very sculptural and artistic

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kind of houses and also special way of drawing, very beautiful, very abstract. And you see he's very much into De Stijl and primary colors in elementary space. And to close off with this, so he would never talk about him being gay. He was a director of what was then the precursor to the architecture institutes. But he was never ever, you know, no one would come to his private home,

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for instance, we talked with contemporaries. Their partners were not allowed to enter somehow the official world, and this is his private house or designs that he made for his private house and it's a crazy house. It's like a house for four different people or for four different characters. That creates, a not a labyrinth, these models were made by students later.

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Here, you see, these are all stairs. Here's a piano, of course. There are sleeping spaces, meeting spaces, and it creates, again, a fantastic labyrinth or a playroom or a playground, where you are never quite sure what you're looking at, what sort of space it really is. The essence always escapes you in a way which is very much part of this queer theory thing, there's an aspect of escaping essential meanings because this

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strategy of hiding and playing with different persona. So this is a nice image to start with. So you get a mask again, a filter, an image behind all sorts of things happening and you get a little peek sometimes what's behind it, but you never get to know the full story. So this is part of the research I'm looking into now.

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So thank you. Thank you, Dirk. There's, of course, time for questions also for people online. You can use the Q&A to ask questions. Your question will be read out loud, if there's any. I will look at my colleague for that. So first in the room, are there any questions? Thank you very much for the introduction. It raises a lot of questions, I must say to me, but I think my main question is: in your 'college'

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you show us examples from the past in which individuals try to hide away from the open and from the public space and that's my question. I think it's very important to be visible as well, and to be part of that public space as a queer community and to what point have you seen examples or ideas about how we can be visible and safe as well?

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That's a very good question. There's in this discourse, a research field, there's different ways of looking at things. So this is very much now focusing on private houses, but it's also a lot of research on public spaces, what's happening in public spaces, bars, for instance, in clubs or just salons. We had one very interesting discussion about it when we organized a seminar on this and it was an architect of a gay 'Woongroep' or collective.

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They wanted to build their own collective houses, about 12 apartments because they wanted to take care of one another when growing older. The 'Roze Hallen' it is called. And it was super interesting because the inhabitants had exactly this discussion. Should we be visible from the outside or should we somehow be invisible because we might be attacked or that things may happen, etc.

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They solved it by creating a kind of art piece. So with the balconies they created a special sort of, yeah, they brought in an artist to think about this balance between visible and invisible. So the house itself became a little bit different from the other houses, but if you wouldn't know, it was just a special art kind of treatment and to some it would signal, oh, yes, that's the special 'woongroep' living there.

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The gay collective and for others who wouldn't know it would be just anonymous. This is really part of the balance. But I don't think there's a rule for it. I think it's really up to yourself if you want to be out and visible all the time or also have the possibility to say at some point, maybe

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I want to stay inside. Do you have a suggestion? That would also be great. What I see is that we have that flag sometimes at our houses. But it's only on special days. Well, I think public space should be a safe space for everyone. So how can we make that?

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That's the main question.

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And not easy to answer. I don't have the answer, but it is absolutely a concern and a topic. Are there more questions? So it's super interesting. We sort of started around like the 1930s. Has there been anything prior to that? I mean, ancient cultures were very open. Is there anything like that in terms of design and architecture that has either disappeared or went on to architectural space

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in 2020. I don't know the whole history but, but there are some of these projects. So in England, in Britain there is for instance a fantastic project by Historic England where people tell their own stories and citizen science comes in at this point often. But are examples indeed of earlier Victorian England, but also going back to the Netherlands, the golden age. The Renaissance in Amsterdam was a very tolerant place, mostly for gay male people.

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But how that relates to architecture I don't know. I have another question. All of the buildings that you show me really puzzled me and they are exciting and I think you can only understand them really, if you also understand how the open space around it, the gardens, are designed. Maybe open to the environment, but then the garden is a safe space as well.

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Don't only look to the concrete things, the walls etc. But look how it's positioned in the environment and I think sometimes you can have a very safe space. Normally in the Dutch context, the gardens neighbors can have a look in it and if you have a courtyard, inside it's very safe and the function of that can be very different.

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Yeah. This is the example of Onno Greiner. The little court. There are also for single women safe spaces. Yeah, you don't know.

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No, individual women living there, who might be into all sorts of relationships. That's true. So question somewhere over there. But I think the notion of safe space is a very nice notion to look at all sorts of uses in the city and all sorts of buildings and clusters of buildings. that indeed house communities or groups of people.

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It's very interesting. Thank you for a wonderful presentation. I think I have a small question regarding the expanding this house based queering of communities or the queering of urban scale public spaces. How do we envision for the next 50 years?

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After all this I think there will always be a kind of play or game happening between in- and outside. I mean, it's a super useful tool to understand what's happening. And of course in many of those examples, it was a different time, much more hostile. And now I hope it's much more a matter of choice and option, because there will always be a desire for privacy and people not having to look in, but also to then reach out and there are these

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moments of the festival, of the event like the Pride or the Amsterdam Canal Pride, of course, which is one of these moments that's a city space or a public space completely transforms. And these are temporary changes. But I also think that through the festival and the events in the city or in the streets, they really bring about transformation in cities and communities.

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I mean, this is why we do it. This is why we parade, of course, that we want to make people aware. Oh yes. And now the canals are not just anymore a space for trading or for heritage, but they have

become spaces that we now identify with emancipation and progress of the queer community. So yeah, these meanings and values, they change and we can appropriate these spaces I would say, there are brick spaces, concrete spaces, but it doesn't mean that they have only one meaning and as you say, so many of you, that visibility

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is absolutely part of it. And events and festivals and parties help in creating visibility. Looking at the time, we have time for one more question. These are all fancy houses. So what is the current situation for building affordable houses for the queer community? Yeah, that's a really good point.

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So this in this intersectionality debate, we often forget about class, right? People with much less money, less support from family or their environment. This is an under-researched field. There are a few researchers who look into squatters movements, into gay communities, in the broader sense. I went to Australia in an exchange for a visiting scholarship and it's settler culture, right?

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So there's just this space and people move out of cities to create their own communities. And as examples of gay and lesbian communities will build their own spaces out of nothing. And there's not middle class money and not fancy houses, but it's very rare. It's true. And this class issue where is the person who doesn't have money, where is he in this space?

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So it becomes the story of appropriating spaces. And in London, a colleague of mine looked into the trans community, very little money and they managed to create a club and a meeting space. So the whole idea of architecture changed. It was not designed anymore. It was user controlled, and the user became an architect in that sense by appropriating the space to the needs of their own community.

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And it's a way looking at architecture as it's very different from the classic engineer. So I often say we have to bring in a radical user perspective and much more radical than we now think. And we need to look more into this. Great. Thank you very much Derek, for the very nice presentation and also thank you for the nice questions.

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Now we have a coffee break. Let's thank him again. Now we have a coffee break and I would suggest that we continue the program at 3:10. Great. Because I would like to announce our next speaker, Professor Andy van der Dobbelen, who is here to tell us more actually about how you do the energy transition in the built environment.

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So I'd to give the floor to you. Thank you and thanks for inviting me. Apart from professor teaching architecture students how to design sustainable buildings. I'm also a sustainability coordinator of

TU Delft. So I'm busy with the whole transition here on the campus to become carbon neutral and circular and climate adaptive. But I won't focus too much on that.

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But in the handout that I will provide, there will be also extra slides, so you can watch what we are doing. I primarily want to focus on climate change and how that actually hits us all and we can do about it. I don't think that there's any distinction between people, when you talk about climate change, there is a distinction, but I will get back to that later.

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What is it that we have to be aware of? What will change? And what is already changing is, for instance, more extreme weather. If you ask insurance companies, they can tell you that there is an increase of damage that is caused by storms and hail. And of course, indirect effects. What we have not experienced so much in Holland yet is forest fires.

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Not too bad, luckily, but we can imagine that if we had had just one person in the Veluwe last summer who would have spilled some of their coals in the forest and it would have gone up completely in flames because it was so dry that it would have completely burnt out. And then we would have noticed that the Netherlands actually is a very dense country with even more problems

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if this happens, then in Portugal like this one. But we should be aware of this. This is a serious thing and it's related to temperatures, we know already that even in the Netherlands now, 40 degrees is becoming almost common, I would say in summertime, especially towards 2050. This was the record year 2019 when this maximum temperature of 40.7 was measured.

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When I was young, 36 was about the maximum that you could get in summertime. And what not many people realize is that actually these temperatures are always measured outside the city, not within the city. And we know at the same time, from satellite imagery, that cities are much hotter than the rural countryside. So I was born in Tilburg, which is very close to Gilze-Rijen, this is a military airport.

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So open fields, a lot of green. And Tilburg is a very stony laborer's city, which must have been 48 degrees. That's Indian temperatures almost, and that makes cities hardly livable anymore. So that's a problem. This is because of the urban heat island effect. It's a natural phenomenon primarily related to the sun. Sun being absorbed by stone, by tarmac, by bitumen, and then heating up the city later in the evening.

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But we have an increasing amount of anthropogenic heat, as I call it. So that's heat released by vehicles, by equipment and also by air conditioners, because air conditioners can be very nice for yourself cooling down your building, but you're blowing out warm air to your neighbors who then also have to install an air conditioning unit. So that's a dangerous thing.

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And of course, here up in the north, we have a few cities that have been designed for higher temperatures. We are mainly designed for cold winters. And now this is changing and we shouldn't be surprised about these high temperatures in cities because if you go to a higher space somewhere on the roof and look around and you understand why all these cities heat up so easily, you have bitumen, you have roof tiles, you have steel plates, and they all become really hot when the sun is shining.

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Bitumen, for instance, can heat up to 80 degrees when in the middle of summer and then you can have a lot of thermal insulation. But the space underneath will still be hot. So we need to bring back nature again in cities to reverse that effect. So green actually is a natural air conditioner. And apart from all the other functions which I will address later, I think it's very important to start becoming understanding here in Delft, we should become engineers that understand green and ecology again and not just think in technical materials. What we will also encounter more is floods.

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This was the summer of 2021, South Limburg in the Netherlands. Belgium and Germany were worse. And I always say, if this torrential rainfall that happened in that area of Europe, if it would have been here in the West, close to The Hague and Rotterdam, I think we would have had a totally different climate policy because we haven't felt the pain here in the West.

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And politicians haven't. And of course, yeah, it was bad for Limburg, but Limburg economically is not as important as Rotterdam and The Hague and everything else here. So I think maybe we need a small, not too strong disaster to make people aware here in The Hague that we really have to do something about it. Already 15 years ago there were plans to make our cities much wetter in the sense that rain and other other forms of precipitation could be better stored in cities.

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And then if you would have a period of droughts, which we have more often nowadays, there will still be some water for the plants and to be used by humans. In the same time, there was a lot of ideas of water architecture. So if we create more water, we can also build different buildings that can actually float and and that can go together with a wetter country like we should be perhaps again.

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I was myself involved in a study for the Zuidplaspolder that's deepest polder in the Netherlands at the moment. It's between Rotterdam, Zoetermeer and Gouda, about seven meters below sea level at the deepest point. And there were plans to extend the existing villages and cities and but the ministry was aware that there would a flood risk in our changing climate.

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So civil engineers calculated the flood risk would be 1.3 meter once every 100 years. For what it's worth, 100 years could also be tomorrow. But we thought, let's take it as a nice design assignment and design buildings that can actually be safe up to that flood. So here you see a few typologies and of course you see some ancient ones, houses on mounds, the houses on poles, a floodable carport, the floating house.

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But I think it's also very nice to think about water resistant walls. We can easily make this and then your house is still safe and you make it a nice split level dwelling or aquarium glass. And then you see a different biotope when there's a flood. We can also create mini polders. But then of course, you're being shut off from the world when there's a flood.

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So it needs to have a basement actually, cellar with food or a boat, that should be alongside. But it was just to show that we can also take this climate challenge in a positive way and think creatively about solutions. At the moment they're actually constructing the extensions of the villages and they do it in a traditional way. So it's traditional housing, not safe for flooding at all.

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So basically what what policy politics do is, they choose for damage afterwards and for a lot of costs related to converting that damage and repairing things, whereas we could have also chosen for this, buildings that are 10% more expensive but are completely safe. It's a choice. In cities itself, we should also retain rainwater much better, and we can do that, for instance, by storing much more on roofs, by making green blue roofs, polder roofs or sponge roofs that can absorb a lot of rainfall and keep it there for a longer time.

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Or when that's not possible, we can solve it on the ground floor. Rotterdam has this world premiere of water squares that are normally dry but in heavy rainfall gradually fill up and then become a playground for kids to play with water and they love it. I think it's a very smart way to deal with water because if you don't do this and you flush it to the river it will create floods elsewhere.

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So we need to keep it as long as possible. And of course, it helps when there's a drought again afterwards, to have a storage of water. So I think we should start preparing buildings for a different climate, for the climate of 2050, because everything we build or we renovate will still be there in 2050. So we need to be ready for that.

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I mentioned this already. Another thing is that, well, maybe we should learn from warmer climates and how people used to build there in the past when they didn't have technology, when they didn't have a lot of money to import things use that architectural types more in our country and then make it our own. Not many people assume that the Netherlands actually is quite cold.

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Still, even with climate change we have an average temperature of how much do you know that? Fifteen? That's what most people think. Eleven. It's eleven degrees at the moment, which is already two degrees warmer than in 1900 when it was nine degrees. And we're expected to increase up to thirteen. But if you talk to people from southern Europe or Asia, they think like, wow, that's really cold.

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So we don't need our air conditioners. We should use our soil because our soil has the average temperature of the year. So if you dig into the soil two meters, it's very stable around eleven degrees, so you have free cooling, if we use the soil. And this building is using the soil, it has foundation piles that have tubes in them.

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And that exchange with the underground. So now we're using the summer heat that was stored when it was nearly 40 degrees in summer and it's additional heating now for the ventilation system that is already coming in with a moderate temperature because of the phase change materials. So it's a very smart building, this one. This is the most sustainable building on the campus at the moment.

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So not Echo. Echo is energy producing, but it's actually not. This one is. Anyway, heat pump systems are a good solution because heat pumps can cool and heat. And that's what we need in our changing climate. And it's a better solution than having a boiler on gas and having an air conditioner. But we should not install air-to-air heat pumps too much because air-to-air heat pumps are the same as air conditioners.

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They blow out warm air in summertime and then we're heating up the city again. So using the soil, using water, it's better. And I will explain that later also. Use more green. That's what I mentioned, and create biodiversity. There will be places on earth and this is Palermo on Sicily, where more severe measures are needed.

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And that's related because Palermo was 50 degrees during two consecutive summers already. That makes the city completely uninhabitable. What you can do a technical solution is actually make squares and roads, lay piping in them, push cold water through it, and the water collects solar heat and you store the solar heat underground for wintertime.

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And then you are actually the city and creating a heat source for wintertime or for other hot water purposes. So I think we need to become smarter also to help the areas in the world that are becoming uninhabitable gradually. So, yes, climate change will hit us all, but the impact is not divided equally or righteously, you could say. It's the poorest regions in the world that are suffering most. So rich and poor,

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there's a difference, but also between women and men, because especially in Africa, where climate change is also hitting harder than here, it's usually women that have to get the water for the families so they have to walk long distances. It's very difficult to get it and it's getting worse. So I think those who are responsible and let's face it, we in the Western world are responsible more than other parts.

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We should help others. So solidarity is very important. Now the great sustainability challenge, therefore is related to climate adaptiveness to make the built environment also carbon neutral. Circular is an important one and then adding value. I will shortly go into this. So climate adaptation I mentioned, carbon neutral, you need to become that as soon as possible and not for ourselves but for future generations.

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If we if we quit emitting CO2 today, then we will still have the impact of what we did till yesterday for 50 to 75 years because of the degradation of carbon dioxide in the atmosphere. It's very slow. I made a MOOC, I'm not going to show this film, but it was a film that actually explains in a very simple and funny way how much energy we actually use in households if we would have to generate that energy by ourselves, for instance, through rowing on rowing machines that can produce electricity.

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It's a very funny film, so you can watch it on YouTube, just look for 'energy slaves'. And it was made actually for a MOOC, a Massive Open Online Course, that also teaches people across the world how to design or redesign zero energy buildings. It's open right now, it's for free. So if you're interested, then you can have a look on the site.

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There's also people following that have their own home and want to make their home more energy efficient so they can also watch it. The main idea behind that approach to zero energy buildings is that you should always first understand the local circumstances. The climate, the underground, the surroundings, the ecology, and then start to think about reducing, reusing or producing energy or other resources and reducing the demand

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is actually the most effective step, and I'm sort of sad about the whole development around the terrible war in Ukraine that the focus of our government has mainly been on how are we going to import gas from other parts of the world instead of thinking, okay, let's try put a lot of money into saving energy in the built environment and to actually reduce the bill in that sense for people.

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This is my own messy kitchen. We have so many equipment, we have so many much stuff that is using energy that we can do a lot there. Also important, step two: heat recovery from ventilated air. I was talking to Dirk about this. It doesn't always work well, but this is quite common at the moment. And also shower water of course, runs away with 35 degrees or 40 degrees and whe're not using it again and there are systems now that can actually recover that heat.

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But much more interesting is the urban scale. We have many functions in the city, many different buildings that all have a different energy pattern. If you look at the bars, which is the use of heat, cold and electricity per square meter, and instead of looking at buildings separately, we should actually be thinking about connecting and exchanging energy between buildings because it's very simple.

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If you if you are cooling a building or a certain function, like in supermarkets, then you're actually emitting heat all the time. And especially with supermarkets, that's a stupid thing because they need to be in the vicinity of people living, right? And this is a part of Amsterdam and my graduate student, Nick, he looked at connecting the energy systems of both building types.

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So the apartments together with the supermarket and then by doing that he could save actually 60% of the carbon emissions without even having to renovate the existing buildings. And that's simply the heat released by the supermarket that is directly used or stored in the underground and then used in wintertime. And that made it so much more efficient because there's so much heat coming from that, that he could do a lot.

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If that's not possible within a block, then we can also think about creating networks, heat and cold networks, that help to exchange the waste heat that normally would be released into the environment. So I think the key for sustainability is connecting, and that's a nice story because it has many connotations, but it's about different buildings and organizations and within neighborhoods.

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So I think that a sustainable transition towards these systems will help actually to connect people much better than rather be separated like we have now. The last step then is to produce your own energy, for instance, solar energy in this case. But if you look at these roofs, this is good, of course. But on the other hand, we also know when this is producing most of the energy, it's when the sun is high, which is in the middle of summer and it's in the middle of the day.

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And then in winter time, it hardly produces anything because the solar panels are horizontal. So then we have an enormous excess production in summer and we have a shortage in winter. So we

need storage. But batteries only do that for a short term. Hydrogen loses a lot of energy while doing that and you need different infrastructures.

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By the way, there's one house here connected to hydrogen as a test case and we can create e-fuels. But that's in an early stage of doing that. We have e-refinery project at the TU Delft where we are actually making carbohydrates. So fuels, could be petrol, could be diesel, could be kerosene from CO2 and a lot of electricity.

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But that's maybe something for the future. I think for now it's much better to think about supplying your neighbors, helping your neighbors to use electricity when you have too much, or that you design differently. And by that I mean that in our country the sun doesn't go much higher than 63 degrees. That's in the middle of summer, 21st of June, 12:00, solar time. In winter time, 21st of December it doesn't get any higher than 15 degrees, though.

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In the Netherlands, actually the sun is more horizontal than any vertical. The means that we can produce much more energy by using the facades of buildings. And now, of course, this might be considered ugly, even though in architecture you should not talk about beautiful or ugly. But the advantage is, if you do this on the eastern side, you have sun in the morning and the west side you have electricity

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in in the evening when you get home, nobody is there in the middle of the day and panels that are on the roof, they produce most in the middle of the day when you are out working, or you are going to school. So it's not a smart solution. But if you have vertical PV on the south, then you have much more production in wintertime because the sun is low.

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So I think we should do much more with the facades and it can be done in a more beautiful way and I will show that later. So in the meantime, our buildings are becoming more energy efficient and that means that our carbon emission, because of energy consumption, is going down. And then we forget that we have a lot of building materials and other stuff that that needs to be produced and that generates a lot of carbon emissions.

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So building materials are becoming more important than energy at the moment. So we have to work towards circularity, because everything is connected. Circular construction, short story. There's two ways we can think about technical materials that are finite and try to reuse them as long as possible. Recycle, reuse, reprocess. And the other way is using renewable materials such as wood and using it as long as possible,

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of course. Those are the basic principles of circular construction or production, but also we are a poor country. We have hardly any useful resources. We have clay, we have some plant material. There used to be gas, but it's nearly done. So most of the resources we have in The Netherlands, the valuable resources are imported from the global South mostly, and now we have it in our cities.

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So we should be careful and try to reuse that as much as possible and then perhaps pay back the global South for everything they've delivered to us in the past few centuries. And there are new business models that do not assume anymore that you are owner of everything you use, but the company that produces it, and they have to take it back and recycle and reuse it again to save energy and to save resources.

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So that is related to circular procurements, the so-called R-ladder, which relates to everything. Here at TU Delft the biggest carbon emission is coming from procurements of furniture, of equipment, of coffee cups, of building materials for renovation or for new construction, by far. And I think that applies to many organizations. So we have to be really smart about this and think about circular contracts with suppliers because they have to work along with us.

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We have to collaborate. We don't know how to produce a computer here, even though we are a technical university. So the company needs to do that. And another thing, our faculty of architecture was actually a beautiful building, the best building here on the campus. Our real estate company wants to get rid of it and wants to build a super sustainable new building on the south campus.

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Well, nobody at architecture wants that, but they think, because they think in energy only, that that's the best solution. But this is the forest that we would need to compensate the carbon emissions for the building materials if we would build a new building. And this is if we would completely strip the building off its facade, the infill and the building surfaces and then make it energy neutral.

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Even then this is much smaller than the other one. So renovation and transformation is by far the best solution and we will never leave the building. And in the same story, everybody is now talking in The Netherlands about a million new homes. We need a million new homes because there's a shortage of housing, which is true, but it doesn't mean that we have to create a million new houses.

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There's a lot, about 650,000 houses, that could be created in existing built environments, in empty buildings, in offices, as top-up apartments, as infills of cities that are not used well. And one of the solutions that we thought of with our students is to look at these towers. Maybe, you know, the towers, the names of the towers? Het Marconiplein, the Marconi Towers. Very old people remember them as Europoint towers, but they have a new name.

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The Lee Towers, this guy. So for foreigners, that's hard to understand. But he's a Rotterdam singer. Terrible singer. But the people love him, and the towers are named after him now. But my students thought about this. These were empty towers where the municipality used to work. They wanted to make it a net positive building, not just looking at energy, looking materials, food and water and air.

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And they came with a solution. So with modular infills, so people who don't have a lot of money and that have different ways living and Dirk was saying that, not just for one typical household. No, for a single household, for people who live differently. Also people with three adults living together. Those are all possible.

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It is a tower. It doesn't have an outdoor space and balconies were impossible. So we had to create outdoor space inside. And then we used this green wall in the same time to actually purify the air coming in from outside. Because Rotterdam is the dirtiest city of The Netherlands because of the industry there. So if we can filter the air through the root zone of the of the plants, then it comes in cleaner and phase change materials, just like in this tower here, they sort of preconditioned air to a temperature that is already quite acceptable.

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So this was an artist's impression of what we wanted to do with the facade as a power generator, because a tower has hardly any roof space. So putting PV on the roof doesn't have a big influence. So we proposed to use vertical solar panels in the facade, also PVT chimneys, so those are solar chimneys that produce electricity, heat and ventilation.

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And then of course, for the competition, we couldn't build a whole tower to show what we were doing, but we took out a part of it. So here you see how we did that and this is what it became. And now maybe you can recognize that block over there because that's what the building is. So it's a one on one model, real life size.

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And this was our entry to the competition of the Solar Decathlon 2019. And it was reconstructed here again. And now it's being used as a meeting space, but it's also livable. Somebody can live there, there's a bed inside and there's a kitchen and a bathroom. So this is one of the things. Not many people noticed that we were doing this in 2019, but one person did and he invited us for coffee.

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I don't know it's a recommendation nowadays. Maybe not, but I believe that he should be in your community, actually. And that relates to finding added value. So I think we should put emphasis much more on the advantages of the sustainable transition. It has been too much on reducing, doing less, avoiding carbon emissions. No, it can also be something beneficial.

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And one of the things is if we use green, it has so many advantages that it's actually a no brainer that we should start to learn to work with green everywhere. There's so many advantages that are related to it. So cities can help this whole transition. Ecologists know that biodiversity is the life insurance of the planet, because we lose biodiversity and now it's collapsing terribly, so we need to do something about it.

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And I think that we can also say that the life assurance of mankind is human diversity, as if we would have just one human species, then we were very vulnerable. So I believe that this is really I truly believe that this is important. Another added value we can find in the built environment is, if we use aquathermal heat more, that's basically taking out heat from water to heat your houses.

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You use heat exchangers for that, with a heat pump system. What they do is, of course, they cool the water because you take out heat, but our water here is already three degrees warmer than it should be, two degrees because of climate change and one degree because of all the heat that we discharge into the water from power plants, industries, whatever.

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So if we take out the heat, actually we create better water quality because at the moment it's terrible. There's a lot of bacteria and algae because of the temperature and because of nutrients. So the water quality will be better. We can create urban cooling in summertime if we also take out heat in summertime and store it. But of course, this is the most important thing for Dutch people.

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If the water is becoming three degrees cooler, then the probability of ice just increases. So we can do ice skating more rather than less. And this is only possible if we do this sustainable transition and not if we stick with gas boilers and use hydrogen for that gas. That won't help because it doesn't help this transition.

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And this actually works because this is of course important in the province of Friesland, especially because everybody's still hoping for an ice skating tour, the Elfstedentocht and I was in contact with Gerrit Hiemstra, our meteorologist, the weatherman of the news and he has a house that has an aquathermal system. So he has this heat exchanger in this water on the right hand side.

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And he was sending me this picture saying: Hey Andy, it works. You can see ice here in the harbor where the heat is taken out. And this is the river, part of the Elfstedentocht and it's still unfrozen. So you see that the actual principal works. It's just physics. So that's very nice to see. The final added value I want to discuss it that you couple sustainability to social societal issues.

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I don't think it will ever be accepted if we don't connect it to improvement of conditions of people, of poor people, of people who are minorities, of people who are discriminated, etc. So sustainability should always be combined with those social issues. And this is in the plan of my students of Solar Decathlon again, of last year, where we actually wanted to avoid the demolition of tenement flats, 'portiekflats' in Dutch by renovating them and the renovation is made possible by adding layers of small modules, lightweight modules made of wood and other plant material

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that could accommodate other people who have a little bit more money. And then the social houses underneath could be helped with renovating. And the nice thing is that this new top up addition could be the power plant for the houses underneath. So they help actually to reduce the energy bill of everyone, like a reverse parasite. The parasite sucks out the life of its host.

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This actually gives life to the house. And if you do it well, then you can make actually the world or that neighborhood much more beautiful. And what you see here, that's why I wanted to show it, is the newest PV panels that you see in the facade. So they don't have to look ugly anymore.

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We have panels that can be printed in different colors, all colors of the rainbow and they can have a print of a painting like this one. Now, this is an artist's impression. So you might think, everyone can make this drawing, but this is the real house as. It is now in Wuppertal. So here you see those PV panels, and it has a print of view on Delft by an artist.

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We couldn't use the one of Vermeer, because that has copyright. Apparently, I didn't know they had copyright in the 17th century, but okay. But this is really beautiful so we can print anything. It could also have been prints of bricks or of green, or whichever color. So I think, again, I'm coming back to that statement.

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I think key for social sustainability is connecting and I think that this should be about connecting between all people, all groups in society, within and without certain groups, and acknowledge differences and helping one another. That's that's the only way that sustainability can become a success. So in that sense, I would say stay brave and be proud and good luck.

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Thank you very much, Andy, for that very nice presentation. I am sure there must be lots of questions. People at home also please type your questions in the Q&A. My colleague can also notify me when there's a question. But first, in the room. Who has a question? Yes, thank you. Well, first of all, I really like to pace in the presentation, so thanks for that.

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My question is, as you presented, there are many technical solutions already, and many of them are really logical as well. But still we don't seem to get there, to the sustainable world. So my question is, what is, according to you, the most or the biggest obstacle to getting to the sustainable world? Yeah. Oh, that's a big question. I do believe being from a technical university that technology is not a problem.

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We have enough means now to make that sustainable transition. But I think that the main obstacle is people and processes and the willingness, unwillingness to create change. And we still see that most politics in Europe are still very much influenced by lobby from the industry that have no interest in changing. So I think we needed a few brave people who dare to stand up to those mighty powers that have a lot of money.

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And one of the solutions to help that transition, when you dare to do so, is changing the financial system, because at the moment sustainability is more expensive because we're not paying for the damage we cause and because kerosene for airplanes is not being taxed and because we give subsidies to fossil fuel companies so that they can keep going and making profits and changing their policy again because the profits are so interesting.

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So I think those those are brave things that need to change. But I start to believe the people up there at the moment don't do it. So we have to push it from underneath. And that's why we see those movements like Extinction Rebellion and other normal people that are worried and that want to create change if the powerful people don't.

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But it's a difficult question. Everyone's trying to do their best. More questions? Yeah. So I'm a bit curious. What happened to the towers? Were they radically transformed? Has any of your innovations actually been adopted or, scaled up? Not with those towers. While we were doing the projects between 2017 and 2019, two of the three towers were actually purchased by a developer, and they made it indeed a more traditional apartment block, which is a pity, of course. The third tower

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we decided, okay, what we do is focus on the third tower. But nothing much has happened so far. What did change is that, a group of those students that worked on the plans, they started their own company, MOR Studio, and they were asked by a developer to help them with the transformation of a of a data center, an empty data center.

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And they did it exactly in the way that the towers were designed. So a totally circular infill, PV panels on the outside, so that you don't recognize those PV panels. And so they are now doing that.

They're becoming like a company that is specialized in sustainable circular transformations. So in that sense it gets a follow up, but not in the original plan.

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So we all know that the climate has been changing for centuries. And do you think the human beings are the only cause of this change? There's natural changes to climate and we know exactly what these changes are because the natural changes are always related to the position of the Earth towards the sun which is slightly different.

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Sometimes the tilt changes, sometimes there's the activity of the sun that creates temperature difference once every 11 years. So we know quite exactly, also when we have had eruptions of volcanoes, we can sort of draw out the development of the temperature exactly. But then the temperature would have been approximately stable in the last century or more.

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What happens since 1900 is that we see that next to those developments of natural causes that actually these natural causes are shifted upwards very fast. And that's the human influence. That's the greenhouse gases that we have been emitting, the industrial revolution. So all climate scientists acknowledge that there's natural changes in the climate, but it is never changing as fast as in the last century because of those additional emissions.

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So yes, humans now are the dominant factor in climate change and not nature anymore. Could moon dust help us? Moon dust? Have you heard about that? No, no. There's studies now that of course, the moon's been evolving for millions of years and our damage is the last 200 years.

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But actually, studies now suggest you could release dust from the moon, which if we create kind of a layer. Geo-engineering, actually. Now there's research ongoing here at the university on so-called geo-engineering. So can we control the climate on Earth by doing something in the outer atmosphere? This would be one of them.

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I think it's tricky. We don't know all the impacts that it would cause. And I think the solutions are also here on the surface so we can solve it also by not doing those rigid things on the outside. But yeah, it might make a difference because, we also know that eruptions and also that 65 million years ago meteorites, that basically killed all dinosaurs, that that also caused some sort of layer around the earth and that created a cooling down, a rigid cooling down.

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But I'm not sure if we would benefit too much of this. It's risky.

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Thank you very much, it was very interesting, your story. It seems logical that the solutions are connecting and storing, that are the key words, I think. Why is it so difficult for our society and our government to follow that good advice? And what can we do concretely? I think it's largely because of our legal system. We have currently a system that generates electricity, drinking water, that processes wastewater centrally outside the city normally, and that we have individual buildings in the city that are connected to those centralized system.

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We don't have a system where we actually connect with our neighbors. And that sort of demands for a different type of responsibility and risk analysis and who is responsible for what. We need a party that actually can, on the meta level, that can service this whole interaction and the energy exchange. And we're getting started there now. So we have these energy service companies that can help neighborhoods to transform.

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But of course, yeah, it takes time to get that normal. And well, we have so many different people with people opposing to being connected, making it also difficult to do the investment. So there's a lot of hurdles there. But in Amsterdam, we're now really trying to do that because Amsterdam has no solution actually for the inner city and they don't want to put in any heat system that is connected to the industry.

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They decided not to do that. A heat pump system is not possible because the the buildings are not well insulated enough. So they have to come up with a different solution because they have to save 74% of their gas use. And there this will become the best solution, to connect and to exchange energy between the buildings.

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But it's a big process because the municipality needs to support it. We need to find an energy exploiter who can take care of it. We need the investment of the piping. So it's not easy. But I do believe that it makes a big difference if it's there. For now the problem is that you don't have another solution?

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But it's a logical solution here on the south campus of TU Delft there's all modern buildings coming and their demand is low temperature heat demands and they need a lot of cooling. So there a network will be laid out that will transport heat and cold and connect all the different buildings together with seasonal storage. So with the newest developments, it's a very logical thing to not solve it on the building level, but to think about the larger scale and connecting. With an existing building or an existing city, that's a more difficult thing, but we will need it sometimes.

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If I may ask a question connecting to this one, what if we would change the entire TU Delft to be net zero terms of energy? What would need to happen and what would be your recommendation, also to our board of directors? The transition is already happening. So at the moment, that's in the part that I didn't present,

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we purchased electricity coming from wind parks at the sea, so you could say that that energy is carbon neutral. Not completely, but it's better than nothing. And the biggest problem is our gas use for the heating system in the campus. We are now changing that to a geothermal system, making it part also of research.

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We don't know so much about deep geothermal heat and how to use it optimally. So we want to do that and in the meantime try to increase our own production of renewable electricity. So more solar panels. I think we need a few wind turbines on the south campus. And then in the end, that should be possible by 2030, to have that done.

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But it's a big challenge. But I think if we don't if we can't do it here at the technical university, how do we expect cities to do that? So we need to show how it's done. Sounds exciting. Are there any more questions? I think we would have time for one or two.

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Thank you very much. You said in your last slide that connecting is really necessary to make developments. What do you see happening there? Are we able to connect in the Netherlands with all different kind of companies and organizations to make next developments? Yeah, I think the awareness is starting to drop in that this is a necessity within cities because of all this diversity of functions.

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But also we see gradually so-called ecosystems of companies in industrial areas or office areas that see that they can better solve their whole solution of energy by collaborating with their neighbors and making a joint system. So I do believe that this is happening gradually. It's less common, like I said, with the existing built environment where people live and where there's not so many companies.

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But I think cities can also steer towards that. And since we are seeing now that energy renovations, especially with historical neighborhoods in cities, is going really slow and it's very difficult, we should not try to find all solutions within renovation always, but also trying to find the solution in

delivering renewable heat and cold and electricity to those buildings. And that can only be done if we start connecting.

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So I think the older cities are now starting to see that the old way of tackling and handling it is not working anymore, so we need to get there. So I hope I can contribute to that by bringing in the knowledge I have from projects we've done so far where we showed that it's possible and it leads to the best results.

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Yeah, but it will take time. But I considered, well, we have seven years to 2030. I think by 2030 we need to be ready here and other parts of the world should be on the right track. That's not a lot of time. Seven years. But that's the urgency we need. Yeah. One more question from me, I guess.

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Thank you very much for the presentation. Also liked it that you said this needs a social component added to it and that it should be something positive for the people involved. And that also sounds like the stories that I hear from Delft, that very often you can have all organizations together, but when you go into the build up area and to the people's area, there's quite some social problems which you bump into.

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And that is hindering it as well. So it's not only the energy transition or technical transition, but you need to think about a society in the neighborhood where you go to and that there needs to be something positive in it for them. Yeah, I fully agree. Did you have some experiences about that? Yeah. I've done workshops across Europe for a European project where we also had to go into the neighborhoods and talk to citizens, to companies, to the public offices and so on and to get to a plan for their neighborhoods.

01:57:17:52 - 01:58:07:02

Those plans that we presented in the project and it was very strongly commended by the EU is that we always came up with a combination of technical, spatial, social and economic solutions because key was really that you provide extra options, extra opportunities for the local people to become better of that transition. And so we also showed how they could start sustainable businesses that would have the neighborhood also to become sustainable and make money for them, to start connecting with the neighbors, also in systems, so that they could save on their energy bills and in the meantime become a more livable area?

01:58:07:44 - 01:58:32:54

So we have a lot of examples of those. So those solutions were always a combination of those elements: technical, spatial, cultural, social and also economic. So also give opportunities for them to make money in a sustainable way. I hope we find good ways to do that. It is important in some areas as some people are just surviving at the moment.

01:58:32:56 - 01:59:15:10

We need to help them. Exactly. Well I'm happy that you can do that in there from your political side. So keep up the good work. Great. Thank you. Well, I would like to end it here, so let's thank Andy again for a very nice presentation. Thank you.