Supporting Information

Title: The Role of Urban Manufacturing for a Circular Economy in Cities

Tanya Tsui 1,2,\*, David Peck 1, Bob Geldermans 1 and Arjan van Timmeren 2

1 Architectural Engineering and Technology, Architecture and the Built Environment, Delft University of Technology, 2628 CE Delft, The Netherlands

2 Urbanism, Architecture and the Built Environment, Delft University of Technology, 2628 CE Delft, The Netherlands

**\*** Correspondence: t.p.y.tsui@tudelft.nl

Received: 17 November 2020; Accepted: 10 December 2020; Published: date

Number of pages: 109

Interview A

7/2 2:00 PM

**SUMMARY KEYWORDS**

Zoning, urban manufacturing, fabrication, vertical urban factory, New York

**SPEAKERS**

Interviewee A, Tanya Tsui

Tanya Tsui 0:45

I just need to get your verbal consent that you’re willing to be recorded, and that the results of this interview could appear in a research paper

Interviewee A 1:06

That’s fine as long as I review it. If there’s an extended quote, I’d like to review it.

Tanya Tsui 1:11

Yeah. So I’ll take notes of the interview, send it to you and then you can correct for factual errors. Okay. Um, so let’s start. I put you down as the director of Vertical Urban Factory. I’ll start with the second question. Have you heard of the circular economy and what would your definition for it be?

Interviewee A 1:44

Yes, of course I have. I would use Ellen MacArthur’s foundations definition, which I don’t have off the top of my head. I believe it’s how we make, produce and distribute and recycle goods. There is no waste, or very little. It’s also a concept from Cradle to Cradle by Michael Braungart and William McDonough, an architect from the US; creating and making products that can be recycled. I think that’s a really important thing. Product designers have to start to consider making and design the product to be recycled. It’s happening with some car manufacturers in Germany, for example. Or with buildings, that can be recycled and made to be taken apart. And there’s some great examples of new architectural projects that are going in that direction too.

Tanya Tsui 3:23

So, is it a known concept in the US?

Interviewee A 3:29

Oh, sure. I was looking for an example here. Anyone in the field that has to deal with production, whether it’s material or energy production needs to understand this concept. The idea of construction, building material lifecycle, and operations of a factory or the production of goods , all that have to be renewable. To me it’s about renewable energy, reusing waste, and making sure that their recycle.

The other topic around that is the idea of industrial symbiosis, where one company’s material waste, or energy waste is fed into another to be used in different ways. I was just part of a workshop in December for looking at the Glonass Neighborhood to try to achieve a zero carbon energy future. We looked at two different aspects of Cradle to Cradle: the products of consumption life cycles, biological production; and the products of the service cycle so the technical side. What was really interesting was how they overlapped and to me that’s industrial symbiosis.

Tanya Tsui 5:44

Where’s this Glonass neighborhood? Is it in the US ?

Interviewee A 5:49

Yeah. That was a really interesting workshop. We had to look at how to make it a zero carbon. They call it that way, a net zero workshop.

Interviewee A 6:22

How do you not produce any waste or energy? When you look at the different components of the natural world, and combine that with the technology world, there are places to create regenerative systems. I think that’s also the same as in the Ellen MacArthur Foundation.

Tanya Tsui 6:47

Yeah, for sure. It’s interesting to know in the US circular economy is a major school of thought in the understanding of sustainability, or is it the idea generated from Cradle to Cradle or something else.

Interviewee A 7:02

I think everyone’s trying to go towards circular economy. It’s a bigger concept than Cradle to Cradle. Cradle to Cradle relates only to things, while circular economy relates to processes, waste and pollution. Right? It also deals with what’s in the atmosphere.

Tanya Tsui 7:28

Yeah. Actually, that’s surprising for me to hear because we e in Europe tend to assume that it’s a very European idea, because it evolved from the UK then spread to the Netherlands. A lot of academic work comes from the Netherlands. So it’s really to know that there’s also a lot of understanding of circular economy in the US.

Interviewee A 7:58

I think it’s the goal right? Yeah,

Interviewee A 8:07

Let me just mention this one. The net zero workshop for Glonass was organized by Jeff Raven, a professor from NYIT. He got a big grant to work with RAIA to have committee workshops and gather professionals in the field to look at this neighborhood to make it net zero. an existing neighborhood. That’s undergoing a lot of development.

Tanya Tsui

What is your definition of urban manufacturing?

Interviewee A

Why are you asking such simple questions?

Tanya Tsui 9:11

This is for people both in the expertise and circular economy and in urban manufacturing. People in the circular economy might not have heard of it.

Interviewee A 9:27

How is that possible if it’s been in existence since the 17th century?

Tanya Tsui 9:33

A lot of people haven’t heard of urban manufacturing as a field of research. It was an idea to ask everyone their definition because there are also many different definitions.

Interviewee A 10:32

Not really, it’s a very basic concept. To me it means making things in cities. The location of where the manufacturing happens versus suburban manufacturing,

Tanya Tsui 10:48

okay. So would you include the maker movement into your definition? People making things in their own backyards or in maker spaces?

Interviewee A 11:00

Yes, only if it’s at a scale. If it’s someone’s sitting making one off items, that would be craft.

Tanya Tsui 11:10

Okay, so there’s a difference between craft

Interviewee A 11:17

Yeah. Do you mean for today or do you mean historically?

Tanya Tsui 11:23

Um, for today

Interviewee A 11:27

Okay, but I think you have to rephrase the question. What are you really trying to get it?

Tanya Tsui 11:34

The extent of the definition of urban manufacturing, whether it includes the maker movement, factories in Peri urban areas, or industries such as bakeries. I’ve had a big discussion with my colleagues at TU Delft on what is considered urban manufacturing

Interviewee A 11:57

The questions too broad. You should make it more specific for your research. You can ask what is made in cities today? How do you define production in cities? What kind of production is it? What is the scale of the production? What is the economy?

Interviewee A 12:25

Right. Because if the question so broad, it’s anything that’s made in the city is urban manufacturing. But manufacturing implies a certain scale. So if you say, production in cities, then that would include the smaller scale. You have to define the scale you’re talking about, whether its mass production or art, craft and maker, which are the smaller scale.

Tanya Tsui 13:06

Yeah, yeah. My own research is in the smallest scale, looking at the maker movement right now.

Interviewee A 13:13

Yeah, great.

Tanya Tsui 13:16

Um, okay, so that wouldn’t be your definition of urban manufacturing.

What are the drivers for urban manufacturing, specifically spatial, societal, political or economic drivers.

Interviewee A 13:49

So first is economics. That’s probably the most important thing. You can have a entrepreneur or a craftsperson or a business setup. They may have the tools and knowledge to create their products, but do they have the financial backing and incentives from the government to create their company? I It’s the same as any small or medium sized business.

Then the spatial to me is what I’ve been focusing on. It’s extremely important whether there is enough space for urban manufacturing, who owns it and how the zoning works for those spaces in terms of whether such manufacturing is allowed or not. You have the city’s economic development offices working on those issues with the city planning offices to determine what space is available, what space can be provided in the future because it’s being taken away.

And then you look at the social side. There’s the economics, the labour force and job training. Yeah. So the job training is extremely important. For someone who doesn’t have an eduction, these jobs usually pay more than McDonald’s or a service industry job.

On the political side, that’s more of the policy side, whether cities and governments are able to maintain places for manufacturing, and whether they want to encourage it. Many cities like New York, would rather have high end residential development and push away the manufacturers.

Interviewee A 16:04

So, the key is allowing these communities to thrive and providing them with financial support so that they can do so.

Tanya Tsui 16:20

And what are the main barriers that you’ve observed for developing or keeping manufacturing in cities?

Interviewee A 16:35

The cost of a space is key. The lack of training and education of workers, and the willingness of the city to invest in training job programs. Depending on the city of course, with all of this.

Tanya Tsui 16:58

Is your main research based in New York or any other city? I would be happy to talk about one city

Interviewee A 17:07

A lot (of it is in New York), but I think it applies to many places. So there’s the cost of the space.

Also the incentives for grants available from cities is important. Many cities or foundations give seed money to companies, to start up new ideas, or research centers.

The small and large scale so that really helps. It’s always interesting because people think that businesses are for profit, so they don’t need grants and loans. Companies need new technology and machinery and new technology. It’s amazing what a company can do with new machines, and how that then enable them to make the money to pay for the people they’re employing.

In developing countries, this is even more important for seed money be available for communities, such as Lagos, Nigeria or other African cities. People are given the opportunity, kind of like micro loans, to start something. How do you equalize the income in some of these countries; allow the people who have the ability to drive or make something.

Tanya Tsui 19:10

You mentioned lack of training and education. What types of training?

Interviewee A 19:17

I always like to compare it now to the building industry in Europe, where there was a strong guild system of passing down major skills like stone masons, or brick laying, generation to generation. But in factory work, with the advent of computer based jobs, digitally based, virtual reality based jobs, the younger generation doesn’t learn how to work to use machine tools. They don’t know how to chop down a tree, whatever it is. They have become so digital that they can’t do the physical aspects of work. While there’s a need to train people to be programmers so they can operate the new technology of the like CNC machining, there also a need to train people who can work with their hands. Like workforce in the construction industry, they may not have the opportunity to go for digital training or engineering, but they can still do work in other ways, right?

Tanya Tsui 20:50

So would you say that you’ve observed that manufacturing firms have jobs but then they have trouble looking for skilled workers?

Interviewee A 21:00

Yeah , it just happened in a town in France that I visited a couple years ago. And it’s a town where they make a lot of plastic. And all the kids leave the small villages where there was traditional manufacturing that has been there for 100 years, or more than that 150 years. It’s a town that was written about in my book, and it’s called Boyeneau. They’ve been making things out of different kind of plastics and resins, and the younger generation, they want to go to Paris or something, and work in a company in the firm and not do the work. So they’re, they’re in trouble in terms of finding skilled workers. A lot come from Eastern Europe. But the government’s trying to start a job training program there.

Tanya Tsui 21:49

But would you say in this situation, it’s not just lack of training. It’s just lack of interest. People are just leaving,

Interviewee A 21:57

That’s what we keep saying to in Philadelphia, where I did my film project. This owner of a steel carding metal company would go to job fairs at high schools. Most of the students don’t go on to university, and the parents don’t even know that factory jobs are good paying jobs. So he was kind of on a mission to tell the parents and the high school students that they could get $65 an hour working in a welding factory. They don’t even know because we’re so far removed from making things nowadays. Everyone’s just on their phones. That they aren’t even aware that it’s an option.

Tanya Tsui 22:58

That’s really Interesting. What kind of firms encounter would these problems? Or is it just all across?

Interviewee A 23:38

I would say the larger scale heavy steel working companies. I don’t have a statistic on that though. Not off the top of my head. I have to look it up.

Tanya Tsui 23:55

Yeah, sure. Have you observed that circular economy is a driving initiative to any urban manufacturing firms?

Interviewee A 24:14

It’s hard for companies to do this because it costs a lot of money. And so again, there needs to be grants for this kind of initiative. They also need training and analysis of how to do this. Also there should be foundations and consultants who help but often they don’t even know that it exists.

I have a crazy example. I was doing research with my students about eight years ago, we went to a bakery to talk to them about recycling. The staff didn’t even know that they could recycle and compost coffee and egg shells. They were just throwing them out.

So there’s a lot of education that has to be done, especially at the older companies, those who have never done this before. It’s hard to get them to change their ways. It’s a big investment in something new and different. They really have to know that it’s going to be longevity in their investment. Just like investing in solar energy. such as putting solar panels on the roof. I It’s a major investment in the beginning, but then it pays off later. And that’s something that that manufacturers tend to do, they’re more concerned with saving energy costs. It’s all has to be about money. There has to be a bottom line.

Tanya Tsui 25:58

It seems like they’re more interested in energy.

Interviewee A 26:03

Once I had a manufacturer in the metal steel cable business. I said I’d love to talk to you about sustainability and he wasn’t interested at all. It didn’t matter to him. I was shocked. and thought you don’t care about the climate? You don’t care about the amount of energy you’re using, or the products you’re wasting? Yeah, there was no way that he would invest so much in order to do that.

Tanya Tsui 26:35

Yeah, indeed. But the idea of the circular economy is that you could take waste which costs very little and use it as a raw material. So you would replace the raw material with cheaper, secondary material. But is that not something the manufacturers would consider?

Interviewee A 27:07

I think some are. There’s one couple who would use wood scraps to make wood bricks to burn in their furnace. And there’s a garment manufacturers that take the leftover strips of cotton to make spaghetti straps out of them for shirts. But it’s usually a waste product at the end of the at the end of the production line rather than the beginning of it. I In a way, it’s not a circle, it’s more a loop or something.

Tanya Tsui 28:18

There are probably more examples of circular manufacturing in Europe.

Interviewee A 28:23

Definitely

Tanya Tsui 28:26

You mentioned in your book, vertical urban factory. There’s this picture, which was a vision of, industrial symbiosis happening within a city center.

Interviewee A 28:44

Right.

Tanya Tsui 28:46

Have you observed anything that resembles this?

Interviewee A 28:51

No, that’s what I’m working on. It’s so rare and really hard because it’s also a social issue. You have to get them to work together they’re little bits and pieces. I mentioned in Victorinox, where heat from their plants are used to heat 500 homes. Victorinox, the Swiss Army Knife company. The heat energy from their waste is used to generate heat for homes in the community. ,

Interviewee A 29:42

It’s just a little examples of industrial symbiosis, getting the companies to connect to the community. Usually that’s done at the scale of industrial park site, when new companies move in, they sign on to this agreement that they will be part of this system. But it’s rare for existing companies.

Tanya Tsui 30:57

could urban manufacturing be barrier to circular economy?

Interviewee A 31:14

I don’t think the question is raised right. I don’t think it’s one or the other. If a company wants to participate in circular economy they would. Regardless of the location, whether the company in urban or suburban area. It’s individuals, businesses are owned by individuals. They have to make the decision.

Tanya Tsui 31:45

So, I mean, the urban manufacturers that you’ve talked to, are they driven by the fact that they’re producing things locally and that may be because of the lower transportation or carbon impacts, that they are more sustainable? Is that something that they are interested in or proud of, the idea of local production?

Interviewee A 32:12

So, the local production that then is distributed globally, but is also distributed locally because you can only make something for a local population. It’s not a good idea to be limited by that.

Interviewee A 33:23

I mean, that’s what I always say is that with the increasing in local urban manufacturing, then they have a lower carbon footprint and then they are more sustainable because they are producing where they are rather than far away and their clientele and their their clientele is nearby, but also they have a better chance at finding strong labor.

Tanya Tsui 33:52

what do you mean by strong labor?

Interviewee A 33:55

There are more options in the city to find good workers, who live close by and don’t need to commute. The companies are hiring locally, producing locally and distributing locally. That makes for a more sustainable system. I just heard people in Rome commute an hour to work. I thought Americans were bad.

Tanya Tsui 34:28

You mentioned something really interesting, some manufacturers scale up and produce for a global market.

Interviewee A 34:56

Of course there’s something just produce locally, but I think for most companies to compete in the marketplace, they can’t limit where they sell. With global commerce and free trade, you can sell anywhere, that’s less sustainable.

Tanya Tsui 35:22

Yeah. So in that case, urban manufacturing is not truly sustainability. You start off thinking, we’re producing things locally, with short supply chains. But when you do well and start to scale up, it’s back to normal and becomes a global supply chain.

Interviewee A 35:49

Yes.

Tanya Tsui 35:52

**Why do manufacturers choose cities rather than suburban areas?**

Interviewee A 36:14

It has been since the Industrial Revolution, there is more potential for high skilled workers, more entrepreneurs and potential for investors. It’s more sustainable because workers have shorter commutes, and potentially if you so desire, you can have a local distribution instead of global. If you have a very specific, a niche market like fashion or furniture, you don’t need to go global these days, with the numbers of people in cities.

It’s also more exciting, maybe something that’s part of our culture to have things being made that we can see and understand, not hidden away in the places.

Also for labor issues, it’s important to be able to know where our workers are working and that they’re not being abused in some factories in countries that doesn’t support equal rights or other important issues.

Tanya Tsui 37:51

Have you observed trends in terms of location, whether these manufacturers are best to be situated in the city center, the business district or in Peri urban areas?

Interviewee A 38:16

Well, historically, manufacturing was everywhere. Then it was moved out of the cities in the 40s and 50s. It came back at a smaller scale. I’ll be discussing this at a conference in a week’s time in Vureno. I think manufacturing should be everywhere, as long as it’s not polluting. It could be in your home, at a storefront, or even in a vertical urban factory. As long as the nuisance issues and the logistics are dealt with, it can be almost anywhere.

But in the modern era, factories were removed from cities because of zoning regulations. Many of those zoning regulations are outdated. The big question is how to create new kinds of what’s called performance zoning, whereby we can judge the pollution or the kind of bad neighbor quality of a factory, rather than on a case by case basis a blanket regulation. So policy has to start to change and accept this.

On the other hand, there are many companies that are localized according to extraction industries; and we can’t have in cities, such as mining coal, silver and gold or anything. That also applies to other really high polluting industries because of the bad air quality that they impart on the residents.

Tanya Tsui 40:16

But that’s still that leaves a big margin of what can be manufactured in cities. Right. Would you say any groups of products that would particularly benefit from manufacturing in cities?

Interviewee A 40:41

What we have been talking about the four Fs: furniture, fashion, food and fabrication. They’re all well suited to city. They’re best at a smaller scale, but food should be at a larger scale.

Yes, food can be at the large scale. Distribution centers of food are very large and cities need that. The products we use on the daily basis are basic goods, which can be made easily in cities. I’ve been wanting to do a study on what if a city made everything that it used, what would that look like? So I’m trying to do a study of that next.

Artisan products, specialized goods are really great products to make in cities too. Where again, there’s a high level of skilled workers in the urban area. As well, there’s a lot of the new technology in cities, because of the combination of fabrication and research. When they’re connected with universities, there’s even more potential, such as at the Politecnico Torino, they have a center for 3D printing, for super high tech machinery and airplanes. So when you have that combination, it is a perfect synergy in a city.

Tanya Tsui 42:40

Okay, I see. And when you say fabrication, what do you mean?

Interviewee A 42:49

Just like architecture, your Fab Labs, CNC, 3D printing, prototyping,

Tanya Tsui 42:57

So kind of making design, or digital fabrication.

Interviewee A 43:10

Yeah, let’s call it digital fabrication. Anything that’s based on assembly rather than based on original product, for example not steel production.

Interviewee A 43:27

It can be seen as assembly or fabrication of products; such as electronics. New York was a huge electronics center before everything went to Asia. We had radio production, record production, many of those smaller parts and things are still made in New York.

Tanya Tsui 43:48

Yeah, because of the lack of space, small products would survive better in the city I remember seeing the diamond factories in New York.

Interviewee A 44:08

Yeah, I talked a lot about diamonds in New York and other urban centers. It’s selling well in cities mainly because of the population, Which is usually Hasidic Jews or Indians. Also, because diamonds are so tiny.

Tanya Tsui 44:26

Yeah, their value per square meters high enough to pay for the rent.

Tanya Tsui 44:32

How do you see the future of manufacturing in cities? A lot of this production has moved to China, Bangladesh, Vietnam. Do you see all or some of the production moving back ? What will the future look like?

Interviewee A 45:06

I think there are two things - what would a vision be for the future and what is the reality. Maybe the reality is that the small and medium sized businesses will produce goods in cities again. We’re not going to get a T shirt factory in New York that’s mass producing for the millions. I there’s opportunities for high tech, advanced production, new inventions and ideas, where the fabricators need to be close to the research and the development people.

As for vision, it would be a sustainable vision where there will be more production and more jobs in cities. Hopefully, garment districts of London, LA and New York will come back and there would be a more equal distribution of where things are made.

Tanya Tsui 46:38

What is the drive for reviving local production, is it sustainability, or jobs?

Interviewee A 47:06

The driver would be employment, and because of the potential combination for invention.

Tanya Tsui 47:20

Hmm, I see. Um, I think that’s a good note to end on. Yeah. Yeah. Do you have any other comments?

Interviewee A 47:29

No, but when you send it back to me, I might add something, because I’m totally speaking off the cuff.

Tanya Tsui 47:34

Yeah, no worries

Interviewee A 47:35

I might add a few specifics.

Tanya Tsui 49:12

I am working on an EU funded project which focuses on the very small scale, local production and maker spaces. And so not really huge batches, like, we would imagine like it would be batches of from 100 to 500, something like that. So it’s not a big commercial projects. So the project is looking at the maker movement and how that could be utilized.

Interviewee A 49:42

So I think one of the things about with the maker movement is that when the makers or entrepreneurs are starting up, there’s then potential for them to grow. And that’s where there are more job potentials. We keep saying that urban manufacturing is shrinking in terms of the scale of companies, but there are more of them. So you might not have 500 factories, each employing 200 people, but you’d have 1000 factories employing each employing 10.

Tanya Tsui 50:30

Yeah, something like that.

Interviewee A 50:31

There are more of them, but they don’t employ as many. They’re all shrinking in size and scale. But when someone discovers them, they can up scale their factory, that creates a great opportunity. So again, it’s back to the urban economic investments in these companies.

Tanya Tsui 50:57

Yeah, yeah, definitely. So it is looking at the existing maker community how they can be scaled up and turn into entrepreneurs and produce at a larger scale.

Interviewee A 51:12

Right And You should talk to some economists.

Tanya Tsui 51:20

Yeah, I should. Indeed. We have a partner who is an economist. So she’s doing her PhD also on this topic, from an economics point of view.

Interview B

Wed, 2/12 4:24PM • 1:13:37

**SUMMARY KEYWORDS**

People, cities, makers, manufacturing, urban, circular economy, interviewed, barriers, materials, called, entrepreneurs, manufacturers, places, caterpillar, question, business, waste, lucrative, land, externalities

**SPEAKERS**

Interviewee B, Tanya Tsui

**Tanya Tsui** 00:00

Just a minute.

**Tanya Tsui** 00:02

Okay, so let’s let’s start. Um, I’ve scheduled for an hour and a half. Are you okay with this? length?

**Interviewee B** 00:13

Yeah. Okay, great.

**Tanya Tsui** 00:17

Wait, can you just say something to see if I can record?

**Interviewee B** 00:22

Okay, hello.

**Tanya Tsui** 00:24

Okay, got it. Yeah, it should be fine.

**Tanya Tsui** 00:28

Okay, so let’s start. Are you okay with this interview being recorded? I’ll be taking notes and then I’ll send the notes to you. So you can check if there were any errors in the notes. Okay. Okay. So, first of all, thank you so much for giving your time for me to interview you. I’d like to introduce myself first, to give a better context to the interview and then And then we’ll start. So, I’m a PhD candidate at the Department of urbanism and the faculty of architecture at the Delft University of Technology. And I am in a research group that researches on how to develop circular economy in cities. So basically how cities can redirect waste streams away from landfills and towards a second life, such as through recycling, remanufacturing, refurbishing, etc. So, so these process our industrial processes, which means that you need to have industrial activities within the city or at least near the city. So that’s the interesting connection between circular economy and your topic, urban manufacturing. So, so I from my research, I discovered a body of literature mainly from a lot of us writers, including you on how to foster urban manufacturing and cities. But this group of literature seems to have less emphasis or understanding on how urban manufacturing can contribute to the circular economy or sustainability. So, yeah, so my research tries to combine this two areas of knowledge, circular cities and urban manufacturing. And so right now what I’m doing is I’m writing my first paper, I’m nine months into my PhD. I’m writing my first paper, which will include a literature review on the common barriers and drivers for these both both of these topics, and also will include the results of this interview and also interview with other experts in urban manufacturing and circular economy. So the questions I’ll be asking will be also asked to other experts. And this research is funded by a eu project called the Pop Machina project, which I’m also a researcher on. And it will work with seven municipalities in Europe to use the existing maker maker community to transition to the circular economy. So very similar to kind of the work you’re doing with urban manufacturing Alliance.

**Interviewee B** 03:27

Uh huh. Can you tell me what the project was called? Again? It’s called pop

**Tanya Tsui** 03:31

Machina. So, machine of the people in Latin. And it just started also nine months ago.

**Interviewee B** 03:46

Okay, that’s great. That’s very helpful. Thank you.

**Tanya Tsui** 03:49

Okay, great. Thanks. So I put you down as the academic advisor of urban manufacturing Alliance, as well as the Associate Professor of hunter Urban Policy and Planning.

**Interviewee B** 04:02

Right? Yeah. Okay. Okay,

**Tanya Tsui** 04:05

so let’s start with definitions. So are you familiar with the concept of the circular economy? And what would be your definition of this term?

**Interviewee B** 04:19

I am familiar with a circular economy and I actually spoke a few months ago with a researcher from Columbia University, also a PhD student who is working with a professor there. I don’t know if you know them, the professor is called Malo Hudson. But anyway, that I mean, I understand the concept behind the circular economy, which is that waste is a resource and is an under recognized resource and it’s also a problem. In the sense that it is contaminating the environment. And so to the extent that we can try to reduce throughput, I guess you’d call it; by repurposing the waste materials from existing production processes, and that is a positive thing from an environmental perspective. I’ve become recently familiar with the growth literature and political ecology. And I think that there that has some relationship to the circular economy in the sense that it’s kind of making the point that waste is an inevitable occurrence in any economy, and that, particularly under our current consumer capitalism model, it’s a very significant issue. And so and I know that some of the people who are working on circular economy are just trying to figure out from a technological standpoint how to conserve resources the processes that you just described: Recycling remanufacturing retrofitting.

**Tanya Tsui** 06:44

Right. That would be similar to my definition, as well as the circular economy.

**Tanya Tsui** 06:53

Could you tell me again, who the professor in Columbia is called?

**Interviewee B** 07:00

M A L O U H U T S O N

**Tanya Tsui** 07:10

Okay, great. Thanks. I will check them out. I haven’t heard of them. Because here in Europe, we tend to assume that circular economy is a European idea and that it has not spread across the Atlantic yet, but apparently it has. So that’s interesting to know.

**Tanya Tsui** 07:30

So the next question is how would you define urban manufacturing? Or maybe it may be a better way to ask the question would be, what is and isn’t urban manufacturing, for example, is artists and crafts or the maker movement, or someone producing something in the 3d printer in their bedroom, is that urban manufacturing, and what is the limit? That would be maybe a better way to ask the question.

**Interviewee B** 08:08

I think at the broadest level, anybody who’s making something and who is in a city at the time is engaged in urban manufacturing. I think it’s useful to distinguish among the types of manufacturing that can can serve different social goals. For example, from a circular economy perspective, where the where the primary objective is reuse and resource conservation. I think somebody fashioning something in their home out of found materials that they might otherwise purchased from a store that’s been made thousands of miles away, that person is engaged in urban manufacturing from the point of view of a circular economy perspective, from the point of view of an economic development perspective. I would say that urban manufacturing the goal of creating good jobs and sustainable employment. So, from that perspective, an individual making something in their home for themselves would not be engaged in the kind of manufacturing that would be relevant to somebody who is studying economic development and interested in economic development. And I don’t know if you encountered the article that I and my collaborators published in the journal, the American Planning Association in 2017, but that article kind of did a scan of maker for in three cities and they proposed kind of a typology for thinking about or manufacturing from the perspective of economic development and employment creation adulteration. Did you read that?

**Tanya Tsui** 10:28

Yeah, I did actually. That was quite helpful.

**Interviewee B** 10:31

You know about the distinction that I make between the micro maker, the global innovator, and the emerging place based manufacturer. And I think all three of those types are manufacturers to a certain extent. I think people who are interested in creating and sustaining jobs and good work are the most interested in the the emerging place based manufacturer, because that is the type that has the opportunity to provide employment for people beyond the proprietor of the company.

**Tanya Tsui** 11:32

That’s actually a good point you raised, it depends on what you’re aiming for, I suppose.

**Tanya Tsui** 11:39

On to the next question. So next question is about drivers and barriers to urban manufacturing and circular economy, but I will focus on urban manufacturing because that’s your expertise. So I will ask what are the drivers and barriers for different stakeholders? So let’s start with what are the drivers and barriers for makers wanting to scale up their activities or engage in urban manufacturing?

**Interviewee B** 12:19

Okay, well, the drivers are... Well, they have to do with technology a lot of the time. So if somebody is engaged in some kind of a manufacturing process, and they want to scale up the there are a lot more tools available to them than there were 20 or even 10 years ago. And in that sense, I’m talking about marketing and sales platforms.

**Interviewee B** 12:58

In a sense, I think the internet, you could say, has really changed the context in which people who are makers can operate, because there’s a whole online culture of sharing of designs and techniques. We interviewed a person who was interested audio equipment, and he wants to make a microphone, and he didn’t really have much of a sense of how to do it. And he just went on this online chat room with all these sound engineers and electrical engineers and he figured it out, and now he runs a business that makes microphones. So I think the ability to gain a community of practice digitally is significant. So that’s a driver.

**Interviewee B** 14:08

I also think that communities of practice exists crucially in person. And there are a couple examples of hacker spaces and kind of almost social clubs, in the cities that we looked at, where people who are interested in making things and, wanted to make a business out of it, came in and learn from one another in person and kind of almost created a social culture around that enterprise.

**Interviewee B** 14:49

And I’ve recently been working for the urban manufacturing Alliance on a paper about entrepreneurship in the sewing trade, so clothing and other sewn goods. And it’s been really interesting to see how in a lot of cities that are associated with the fashion industry, there are people who design and make garments, and there are these places, these physical places, where they go to get technical assistance and to help one another and to get connected to resources that they need. And I think that’s a particularly that one is particularly relevant for your project because fashion is such a contributor to waste - the fashion manufacturing industry. So you have people who are devotees of slow fashion and local garment production who are able to gain a foothold, both through these online communities and through these physical communities of practice. So, that’s another driver.

**Tanya Tsui** 16:21

you mentioned so what would you think is the difference between the technical community or the online community and the existing physical hacker space? What is what is something that the hackerspace or social clubs can provide that the online platform can’t?

**Interviewee B** 16:50

I think most human beings are social and they provide a social space and place where people can form meaningful relationships. I mean, people do form meaningful relationships on the internet as well. And there’s like a whole lot of people who study that. But I do think that there’s something added, particularly when you’re making something which in itself is a material good, right? Then what you’re striving for is to return to a kind of materiality that has a highly symbolic existence. Then it’s actually particularly nice to be able to go to a place where there are other people who are also committed to that materiality and interact with them in real time in real space. But a lot of the time the way that people find out about hackerspaces is through the internet. So there’s a really interesting kind of symbiosis or interaction happening between the online community and physical community.

**Interviewee B** 18:04

I think the fact that you know that you can make a website and sell from the website relatively easily and cheaply is important. I think the fact that there are these drop ship services for example, rather than fulfilling every order yourself and wrapping it up and mailing it, you can essentially hire a contractor to do your shipping for you, if you have people who are ordering from far away. People who are remote from you can, can easily look at your product, you can post it on Instagram, you can put a picture of it online and then somebody can decide to buy it. That is a driver.

**Interviewee B** 18:53

And so another thing is that in I don’t know if this is the case in Europe, but in a lot of places in the United States, there are stores that sell only locally made products. And so you have a physical retail environment that people are drawn to because of their commitment to shopping locally and buying locally. And so I think that’s another driver and I think we’ve talked about that in the article, that Portland has several of those. So those are the drivers.

**Interviewee B** 19:46

I think also the technologies that allow people to manufacturer are becoming smaller and less expensive, so you can buy a digital laser cutter or a CNC router that sends messages to the computer and then operate a lay or something like that. You still need some capital to acquire something like that, but it is nevertheless within the reach of somebody with a few thousand extra dollars.

**Interviewee B** 20:31

Then the barriers I would say... This isn’t so much to set up a manufacturing enterprise but to scale up or to get to the point where you might be wanting to hire other people. There are a lot of barriers in the local real estate environment. If you’re in an expensive city, it’s very difficult to rent manufacturing space at a reasonable price. And that’s a really persistent issue. There there can be an inexperienced maker who is going to open up some kind of a manufacturing space is going to immediately run into local regulations around noise and fumes and garbage and all kinds of other things. If they’re not pretty savvy, that can really get in the way of their success, which is not to say that those regulations shouldn’t exist, but just that it’s often very difficult for first time business owners to navigate those kinds of issues.

**Interviewee B** 22:01

I think access to capital is a really big barrier. I mean, a lot a lot of the people that we interviewed had pretty much finance their first several years, using credit card debt, because the the prospect of applying for a commercial bank loan was very daunting to them. And those who had applied for bank loans had often been turned down because they didn’t have the right kind of collateral. Lenders tend to be very risk averse. And unless you’re a very large established firm. There’s actually an interesting literature about how lending in general has really tilted towards Real Property and away from productive activity. And that’s an interesting thing to explore. I think the financial markets are very much driven by the land market. And so investment in land, in housing in particular and commercial property, tends to really crowd out lending to people who are making things.

**Tanya Tsui** 23:30

That’s really interesting.

**Interviewee B** 23:33

I just had been reading this book called rethinking the economics of land and housing. It was published in the UK a couple of years ago. And that’s one aspect of the argument that it makes.

**Tanya Tsui** 23:47

So it’s redirecting towards land and away from making things.

**Interviewee B** 23:55

Yeah, land and property, real property. You know, for buildings.

**Tanya Tsui** 23:59

Really. And you literally see it because the makers can’t find real estate. Right? They’re

**Interviewee B** 24:05

They’re operating at all the different levels. Yeah, I mean, and this book really lays it out in the in the UK content. Are you calling me from the UK or from?

**Tanya Tsui** 24:14

No, I’m from the Netherlands.

**Interviewee B** 24:16

Yeah. But yeah, the book is primarily, you know, using as an example the UK but they’re making the argument that housing and land prices just keep going up and up because there’s so much credit available to people in that sector. And then that the availability of credit actually drives the prices higher and it’s a kind of vicious cycle. And, and it’s very easy to financialise, real property through mortgage backed securities and various kinds of derivatives. I think the financialization of real estate actually has a significant collateral effect on the economy.

**Tanya Tsui** 25:16

I’ve always heard about the financialization of land, but I haven’t heard it in an argument that directly connects this to making which is why I found this really interesting. I’ll check out the book.

**Interviewee B** 25:35

Yeah, so I was saying barriers to capital. I think there’s also a bias towards not just real estate but also technology. There’s a lot of VC capital venture capital, running around, looking for investment, but it also has this bias towards immaterial things like software. You can see a big hockey stick type of growth really quickly. Software and internet, applications and, anything that has to do with tech is a magnet for angel investors and venture capital investors. Whereas, it’s considered much more risky and kind of less sexy to invest in a company that’s making.

**Tanya Tsui** 26:42

And this is something you found from just general experience or interviews

**Interviewee B** 26:50

came up in some of our interviews. I mean, definitely the difficulty of finding investment was with a scene in our interviews. I have not studied venture capital per se, or patterns of venture capital investment. But I will say that, you can see it, you can just observe it. In urban economic development policy, generally speaking, there is this kind of, like obsession with tech job.

**Interviewee B** 27:20

New York City is actually a pretty cool example of this. Everybody’s like, constantly following like the growth of jobs and quote-on-quote, tech, nobody knows quite what that means or, what makes a tech job, a tech job, you know, but it seems that people seem to be very animated by the sort of growth of media and digital applications, and that’s driving the city’s land use policies.

**Interviewee B** 28:01

You can see this in New York right now, where there’s a lot of people who work with the city are very actively encouraging the conversion of industrial building to quote-on-quote, innovation space or tech space. And that’s where somebody is going to sit at a desk and be, designing something or sort of creating content or programming, or coding or like that, but it’s not a manufacturing space. And then, of course, that relates back to the issue of real estate and investor return, because those spaces that have been occupied by manufacturers, who were renting it maybe like $15 or $17 a square foot are now going to these office users in tech, who have all this VC money, and they are able to rent for like $35 a square foot. So obviously, as somebody who owns a building, what kind of tenants you want? And so that’s how property owners are thinking, and the city is pretty active in encouraging that.

**Tanya Tsui** 29:23

But you wouldn’t you also argue that the tech industry is more lucrative, so then they can pay higher rents, and because of all this competition, the manufacturers will get pushed out because they they’re just not as lucrative?

**Interviewee B** 29:39

Well, right. I mean, I think that’s, that’s true. I mean, when you think about the word lucrative, you know, you kind of have to unpack it a little bit. This is how I think about it. A lot of the value that people in the tech industry, create ends up going to owners of property - landlords, right? Because the rents are so high. And also that value goes to, high paying jobs in coding and programming or media or whatever. And so that is lucrative from that sense. And I think, you’re correct in that it generates more property taxes, the property values are higher. So city has a vested interest in favoring property that yield more property taxes.

**Interviewee B** 30:31

On the other hand, you know, if you’re thinking about social sustainability and environmental sustainability then, I would argue that there’s merit in looking beyond that kind of like short term, lucrative construction, because jobs that are, actually about making things employ a much wider range of people. And not always that, but sometimes at a decent wage. And it also is better from a carbon footprint point of view if people are consuming things that are made locally rather than things that had to be trucked and shipped thousands of miles in order to reach them. I think that you’re right that definitely from the perspective of somebody, either like the city like Department of Finance, or somebody who owns property in the city. the techies are more lucrative, but it has social implications that policymakers, I would argue, should take into account.

**Tanya Tsui** 31:56

I’ve heard this argument a few times, actually from from different Researchers about looking beyond the short term lucrative and then seeing the positive externalities of manufacturing. So almost seeing building a factory in the city is just like building a park.

**Interviewee B** 32:28

Yes, I think you could think of it in terms of a positive externality. I think you could also look at it in terms of avoiding negative externalities, to the extent that waste is an externality and and pollution and climate disruption, you know,

**Tanya Tsui** 32:46

Yeah. So that’s an interesting argument that I think we’ll get into a bit later in the following questions. Is there any other barriers, you can see?

**Interviewee B** 33:15

I think that the that, you know, one thing that happened when the maker movement sort of gained steam in the, you know, 2009, 10, 11 which is that there began to be all these services tailored towards makers and I’m thinking about Etsy the platform that people can use. I think that that’s that’s a driver, because it’s so easy to list something on Etsy, but it’s also a barrier because Etsy is itself a for profit. A for profit enterprise that’s doing its best to sort of extract as much value as it can out of the process.

**Interviewee B** 34:06

So I think that, based on what I’ve heard anyway, it’s pretty difficult to be like a full on business just by selling on Etsy. It can work for people who do making part time, but there is just a lot of intermediaries that are interested in extracting value, so that to it’s very difficult for somebody who’s operating on their own to, to kind of make a go of it.

**Interviewee B** 34:39

And, I think the barriers that manufacturing entrepreneurs face are very similar to the barriers that any entrepreneur faces, right, they’re doing something new that they haven’t done before. There’s a lot, as I’ve mentioned, to navigate in terms of the regulatory environment and there’s not a lot of support programs and boot camp program for entrepreneurs who are... I think that there’s not as much technical assistance available, or orientation to business available to people who are manufacturing entrepreneurs.

**Tanya Tsui** 35:30

Let’s move on to the next question. So, in your papers, you mentioned these maker enabling organizations. So whether it’s a not for profit or not for profit, or even, for example, in my project, they they’re actually the municipality. So what what are the drivers and barriers for these people who are developing the fertile ecosystem for makers?

**Interviewee B** 36:07

I think some of these, maker enabling organizations, as you point out, are for profit, and some of them are not for profit. So I think for the for profit one, it’s the kind of barriers to having a business and having a, you know, steady cash flow and you know, so there is sort of, I sort of see them as epiphenomenal (?) on makers, right?

**Interviewee B** 36:36

So there’s like places like makers row right, that offers with people access to supply chains and in itself is a startup, right? So you have like, ordinary problems that startups encounter. You know, I think for not for profit organizations and governmental organizations, it’s a little different. They’re mission driven. They’re sustaining themselves, you know, in this not for profits case, usually with philanthropic or government funding. So, you know, those are, you know, that can be difficult to do.

**Interviewee B** 37:21

I think there’s been, you know, if you’re talking about a maker space, there’s a lot of different sort of financing models from maker spaces that and, and, you know, so there’s one in Portland called a dx, which we write about, and that one is it’s a private enterprise, and it’s actually a private private for profit enterprise, but it’s very closely held, which is to say that, like the owners are all people who are very involved in the business. It’s almost it’s not a family, but it’s almost like a family. The people who own it are the people who operate it right.

**Interviewee B** 38:01

there have been some other instances like Tech Shop being one of them. where, you know, you basically had somebody found Tech Shop and then they sell it to venture capital investors or hedge funds or whatever. And then that, you know, they’re trying to operate it on a model that doesn’t end up being financially sustainable and they closed I have been with Tech Shop. It happened with a company called Third Ward in the United States.

**Interviewee B** 38:32

You know, so I think like, there’s sort of this question of like, what is the what is the what is the sustainable revenue model for a maker space? Right? So you know, you have like peanuts, you have people in government funding or philanthropic funding, you have people who are trying to survive on a kind of membership basis. So the stuff makers are like, you know, paying for membership, paying for classes, to have space there, that’s another revenue model. And most of a lot of it is sort of like hybrid, like, you know, with ADX in Portland I would,

**Interviewee B** 39:07

I would, you know, encourage you to look at them if you’re interested because I think they’re, they have, you know, some of the, some of their, their funding comes from membership. Some of it comes from people taking classes, some of the some of it comes from, they actually do like projects, like I don’t know, like a local theatre company will say, well, we need this, we need this, this this and in wood for a stageset and then this then ADX like assemble a team of people, you know, and pay them to do the work at the at ADX, you know, and so that they gain some income that way. So, so I think, you know, there’s there’s, like, particularly with, you know, sort of maker space models, I think there’s, there’s a lot of different ways to do it. But there’s been a lot of failure as well as a lot of success. Like there’s you know, I I’m not aware of specifically, but I think there are some some maker spaces that relied completely on, on, you know, public funding and philanthropic funding, and then, you know, that didn’t last forever.

**Interviewee B** 40:13

You know, so I think those are barriers, I think, the people who are trying to sort of create, as you say, this fertile ecosystem, you know, there’s a constant there’s a lot of churn, like, you know, businesses come and go, some of them just aren’t, you know, don’t make it through the first few years.

**Interviewee B** 40:46

Others of them get acquired, which sort of like, makes the local economic development aspect of it, you know, sort of less salient. Speaking about a company that we interviewed In 2015, in Portland that was, you know, really scaling up and they, they moved to a bigger space and then all of a sudden we read that they had been acquired by a multinational and like they were leaving the area. So if you’re a, you know, a maker, enabling entrepreneur like your team, you know, your, your sort of endgame has to do with the, the health of the local economy. Whereas, you know, an entrepreneur’s end game may be like getting to retire. So it can be can be tricky.

**Tanya Tsui** 41:45

Yeah, that’s kind of weird because you you want to grow you as a person who’s developing the ecosystem. You want entrepreneurs to grow but not that much. Basically.

**Interviewee B** 41:57

Well want them to remain committed to building the local economy first and foremost, you know, not everybody is.

**Tanya Tsui** 42:05

Yeah, yeah. So, I mean, isn’t there’s a possibility for entrepreneurs or makers to grow within the city and then you know, expand and then stay

**Interviewee B** 42:21

that? That’s a great vision. Yeah. And I think that they could but there’s a lot of there’s a lot of reasons why that might not happen. One just being that you know, they are they’re tempted by an offer from a multi-national another being that they can’t find space in the city to grow the real estate

**Tanya Tsui** 42:41

Right, yeah. So they move to more peripheral areas. Yeah, with land much cheaper in this case, where...

**Interviewee B** 42:50

or they just decide to just be a design company and then they do that, you know, their contract their manufacturing to look good. company in China or Bangladesh.

**Tanya Tsui** 43:10

So in the case that you mentioned where this company you interviewed got acquired. Where did they go?

**Interviewee B** 43:21

I would have to look back. It was a mean this is in the news. So I could tell you but it was the deodorant company. I don’t even remember their name, but they were in Portland and they were acquired by Unilever. You can probably look that up on the internet. I think Unilever like closed the Portland manufacturing facility relatively quickly.

**Tanya Tsui** 43:43

right way. That’s really interesting. Are there any other barriers

**Interviewee B** 43:56

in terms of the sort of maker, enabling thing I think it depends of the kind of where you are. You know, I think there’s if you’re in a small town that doesn’t have much of an ecosystem, and you’re trying to build one kind of from the ground up, that’s very different from if you’re in a large city that has one and you’re just trying to kind of help us become more robust and more aware of itself.

**Tanya Tsui** 44:26

that’s really interesting because the seven cities that I work with have both. So we have Istanbul, which is enormous and has a huge maker community. And then we have small shrinking cities like Satander in Spain or Venlo in the Netherlands, where the municipality is desperately trying to pull the entrepreneurs back into the city but everyone’s you know, leaving to Madrid or Amsterdam.

**Interviewee B** 44:55

Yeah, yeah. Well, I mean, in that case, the rising Real Estate costs with an Amsterdam might be a friend to the small town, right? Because if people can’t actually drive in those places, then then they might consider going back. I mean, we, again, this is from our research what we had there was a company that we interviewed that was in Chicago and they moved to a small town in Illinois called Rockford. Ultimately, they’re doing really well.

**Tanya Tsui** 45:34

Are there any examples of strategies of small towns that try to create an ecosystem? Or is it more just entrepreneurs kind of choosing wherever they please?

**Interviewee B** 45:51

Yeah, I don’t think I can speak to that because my research has been entirely in large places.

**Tanya Tsui** 46:06

And another question is are makers driven by sustainability or circular economy? I mean, is, is it part of their marketing strategy? Is it because you could also say getting waste materials is much cheaper than getting raw virgin materials?

**Interviewee B** 46:32

Yeah, yeah. Um, I think it really varies. I mean, there are some companies that definitely have the social mission kind of upfront. And they’re part of the way that they appeal to consumers is that they’re, that they’re using either locally sourced materials or repurposed materials, like a There’s You know, there’s, there’s we’ve interviewed a few people who in the, in the fashion business who are using, you know, waste from fashion production like and, you know, using it to create new items which I’m and it was part of the appeal to the person buying them was that they, you know, recycled materials or repurposed materials.

**Interviewee B** 47:33

I think with something like food I mean it’s obviously you’re not gonna be but you know me but then but then then it becomes more like, like are the ingredients local but so so yes, I would say some about maybe a third to a half of the people that we talked to either they were genuinely committed to doing social good some way or other, or they were they understood the advantage that that would give them in terms of marketing.

**Interviewee B** 48:11

You know, but it tended to vary like I think, I think we met this food manufacturers that we interviewed, who basically said, like, you know, I’m succeeding inside, you know, the more people I’m employing, that’s my metric of success. Like I’m, I’m employing people who, you know, wouldn’t, you know, be able to get the tech jobs and wouldn’t be able to get the office job, you know, what they’re doing, they’re being paid well, and they’re, you know, doing work that’s meaningful to them. That’s really quite critical. But that doesn’t have anything to do with waste, right. Then there are other people who who are using you know, who are using recycled materials and so on. Or materials that are sustainably sourced in various ways and they For that, but their environmental commitment that drew them to the enterprise, but not everybody.

**Tanya Tsui** 49:12

is anyone driven by because the idea of the circular economy is not only can you be more sustainable, it can also be cheaper because waste is for example in in, in the Netherlands, there’s a deconstruction and building materials company. So they basically sell building components and concrete and building materials that have been made from second hand materials. And they, their business model works because it’s just it’s cheaper to use waste than it is to us. Is there anyone interested in that or or Something that works?

**Interviewee B** 50:01

I’m not, you know, I don’t. My memory. That’s not something that I remember from, from the interviews that I did. If they were using if they were using waste it was, it was because it was, you know, it increased the appeal of their product, not because it was necessarily cheaper. I mean, I think it’s, you know, we do still live in a, in a world where, you know, materials that are upcycled might be marginally less expensive, but they’re not so much less expensive that they’re going to drive. That that’s how I think of it for the United States.

**Tanya Tsui** 50:48

Okay, okay. Yeah, I mean, it’s not for everything, but for example, Caterpillar, the heavy duty machinery company, they’ve been remanufacturing their engines, so Like the 70s, or the 80s. So they, in the remanufacturing literature, a lot of times talks about them because they started remanufacturing for Ford. And then they found that it’s so profitable that they used it in their own business as well. And in the 70s, nobody cared about sustainability. So at that time, their motivation to remanufacture their engines was not sustainability, but profit. So now they still have the same model, and it’s still remanufactured, but now they have the additional benefit of, of green marketing. So, maybe that is a gap, you know, that the nobody is exploring?

**Interviewee B** 51:44

Well, I think I think, you know, we would never have captured a company like Caterpillar and our sample, right? We were talking about people who we’re talking about firms with, you know, most of them less than five people working. So, you know, I think if you’re if you’re buying raw materials in large quantities that then getting, you know, having the waste stream as a source of of inputs is potentially quite significant in terms of the bottom line, but I think if you’re doing smaller scale things, it’s not as much. Right.

**Interviewee B** 52:33

And so I think, I think it’s important distinction to make it to, like urban manufacturing is not a, you know, making maker, a coffee maker economy is, in some ways, like an urban phenomenon, and it’s, you know, it’s a big part of the urban manufacturing story. But then there’s also larger companies which may be in cities or they might be in Greenfield sites. And that’s, like, that’s a big place where the circular economy could grow as well. And I’m only talking about makers. Yeah. And that’s, you know, that’s what I know about. Like, I think that there probably are a number of companies that are similar to Caterpillar that have found that like, what’s good for their bottom line from a sort of supply input point of view is also good for the marketing. But like it just, I’m just saying that it didn’t. Didn’t come up with people that we talked to for that study.

**Tanya Tsui** 53:36

Yeah, yeah. Yeah. That’s interesting to explore as well, whether it’s, you know, what, whether it would be profitable and sustainable at the same time, because that’s what was so appealing about the circular economy and I think that’s why it’s really become very popular here in Europe, because it’s like you can you

**Interviewee B** 54:00

Yeah, it just has a kind of logical elegance to it.

**Interviewee B** 54:08

Right, right. Well, I guess I would just say that like, you know, one, one Caterpillar, which is a multinational corporation, you know, accounts for as many Well, you know, as much as much environmental, mental impact and as many jobs as, you know, probably all of the companies... all one hundred and ten companies that we interviewed in our studies, right, like, you know, so it’s not, it’s hard to even compare like, but there’s a certain in the cities that you’re working in, like you’re mostly working with makers, because that’s kind of like, you know, the low hanging fruit and they, you know, the urban policy could deal with like, local entrepreneurs and urban based firm, whereas like Urban Policy isn’t going to deal isn’t going to this Apparently like have anything to say the caterpillar because they’re multinational?

**Tanya Tsui** 55:05

Yeah, that’s also the kind of, for my just personally for my PhD, that’s always the tension that I feel as well. It’s like, as you said, Caterpillar, one Caterpillar, the environmental impact of one Caterpillar is, you know, the same as the impact of 5000 maker entrepreneurs. So that kind of, yeah, that’s something I’m struggling with. But yeah, for another discussion for another time. So, moving on to the final set of questions, which is about why manufacturing should be situated in Cities. So why? Yeah, so the first question is why should or shouldn’t manufacturing be in cities?

**Interviewee B** 56:13

I think it kind of goes back to the externalities question. You know, I think, you know, somebody who’s a pure economist would say many manufacturers is locate wherever it’s going to be most profitable for them to be.

**Interviewee B** 56:30

from a policy standpoint, if you know if there is the opportunity for positive externalities or the prevention of negative externalities, and there might be a reason for them to be, you know, elsewhere from where they would go if they were purely motivated by you know, by their by their for profit calculations. So you know, those externalities, some of them we’ve already discussed, but They include, you know, the social impact of being able to provide employment to people who don’t have a formal education or are not English proficiency, they include the ability to reuse materials easily. And upcycle things because just because urban environments are so dense and there’s a lot of material there, to upcycle

**Interviewee B** 57:41

particularly if there is like a local purchase component to it, where people you know, consumers are also local, then there’s a an externality associated with avoiding the shipping costs. Well, not the financial cost, because that would not be an externality, but the The cost of, you know, the cost the environment of trucking things long distances. You know, so too So I think, you know, there’s an argument that that you know, manufacturing something locally is you know, does offer positive externalities the city does it also can can like be enlivening, you know if your neighborhood environment you know if you have like diversity you know, if you have workshops and retail and residential that are all kind of close to each other then that produces like good quality environment

**Tanya Tsui** 58:52

okay clear. Where in cities should they be situated because when the make more sense for them. manufacturers to be in peri-urban areas or in the periphery of the city, like, well, maybe it’s different

**Interviewee B** 59:12

environmental point of view is probably what you’re looking at the environmental externalities seems like Peri urban would be fine. You know, you’re close enough to the labor supply or close enough to the supply of input. You know, you’re not thinking about you’re just thinking about impact on the environment.

**Interviewee B** 59:38

And, you know, I think if you’re talking about sort of social externalities, then there’s an argument for having them closer in where they’re accessible to, to people who might not have that many job opportunities. You know, where they can be a part of, if they’re light manufacturing, again, like heavy manufacturing is kind of needed zone zone to thrive in a place where people are always complaining about the noise and the spell and all that.

**Interviewee B** 60:11

So it’s, you know, I think there’s a little bit of a mythology around the idea that you can have like residential and commercial and industrial, like on top of each other in the neighborhood with certain kinds of industrial. Yes. But you know, there’s there are reasons why there is industrial zoning, and why some, some, you know, industrial processes are, you know, need to be separated from residential neighborhoods. You know, I think if you again, though, if you’re like talking about processes that are like more environmentally sound and that kind of privilege, you know, non toxic processes, and things like that, that you know, that is more compatible with the city.

**Tanya Tsui** 61:01

Hmm, yeah, that’s clear. So would you say that in terms if you care about social externalities, the closer to the center, the better to have urban manufacturing? I think

**Interviewee B** 61:22

I think I wouldn’t say the closer to the center, I would say sort of accessible to public transportation and working class neighborhoods,

**Tanya Tsui** 61:43

which might not be in the center. I don’t know about the US.

**Interviewee B** 61:50

Right. Right. Well, I mean, this is also the central land costs are also going to be really high. So it’s hard to imagine that there would be like a real Production business that could be sustainable, you know, financially at the very center. I mean, it’s why there needs to be kind of in depth, like areas in the cities which are like, designated as manufacturing areas. Because that’s like, you know, if the zoning is enforced, then the land prices remain low and people can’t, like nobody can, you know, speculatively buy a building with the understanding that eventually they’ll be able to turn it into a loft residence or some kind of like office space, you know, that like, once once zoning becomes sort of lacks, then you know, you sort of, you know, it becomes very much more difficult for, for manufacturing to be viable.

**Interviewee B** 62:52

So, I mean, in New York City we have these two things called industrial business zones, which are supposedly places Where the land the property is like, you know, dedicated to industry. But, you know, they’re not actually in the zoning code. And so, there’s been a lot of encroachment of non residential uses in those amino non manufacturing uses in those industrial business. They haven’t been that effective in, you know, preventing real estate from converting from manufacturing to other uses.

**Interviewee B** 63:34

But that would ideally be what the, you know, ideally, you’d have like these demarcated sections of the city that were that were like expressly for industrial production, and that and you know, and the prices were, you know, the land the property prices would be, would be kept low by that, you know, by the understanding that that, that that you know, that some other in the other other users will not get Glad to be there.

**Tanya Tsui** 64:29

What types of manufacturing are suitable for cities? You mentioned light manufacturing. But, you know, is there any types of products that you’ve noticed or groups of products that are more suitable for manufacturing and cities?

**Interviewee B** 64:46

Well, I think anything where there’s a urban market for it, so definitely food, you know, manufacturing has declined in New York steadily and you know, for 50 years but was it two years but but food businesses are growing a little bit. You know, because it’s like valuable to have like fresh, you know, to be able to deliver them just in time and fresh to the consumer and all that. So that’s what I mean, I think fashion and accessories is another one. Just because like there are a lot of sort of early adopters...There are a lot of you know, in well not in all the cities that you’re working in, but in some places, there’s a lot of like consumers with disposable income and they’re interested in buying something that’s unusual or something that’s been like repurposed or something that’s been locally made. And so I think like that, that you feel out of that, you know, you wouldn’t you wouldn’t do that with say like a toothbrush, right? But if you’re buying something to wear a scarf or a you know, pair of socks or something like that, you might be more inclined to want to buy something that that was, you know, made locally or so. So I think like food, fashion, home goods. Yeah. Good. Like, you know, sort of furniture, lighting. Anything was like an architectural content to it.

**Tanya Tsui** 66:20

Yeah, something that involves design. Okay. And speaking of that, I mean, is it? Have you observed that makers kind of are they also designers or do they work with designers and then they’re in cities because they need to be close to designers.

**Interviewee B** 66:47

The makers that we spoke to, for the most part, started out as designers or artists and then they got into manufacture so it could go the other way. Like, I mean, I could imagine an entrepreneur saying, okay, I want to start a manufacturing company, I’m going to go find some designers. I mean, you know, but, but in our experience, it’s the other way around.

**Tanya Tsui** 67:22

Yeah. You know, that make sense. Because the Yeah, there’s something about the maker movement. That’s, yeah, that attracts engineers or designers because of the open source thing. So right. Yeah, sense. And, okay, final question. How do you see the future of manufacturing in cities? Like, ideally, what would it What would it look like ideally?

**Interviewee B** 67:54

Well, you know, I think that a lot of If there would be an explicit effort on the part of policymakers to remove a lot of the barriers that I discussed, right, so like what if they if there was actual sort of cities got serious about enforcing industrial zoning, and making sure that there were spaces that many people could do production and that were affordable. Then I think you’d see a lot more very small makers able to expand, right. So that’s what you know, cities could can do that in the land market. You know, the, there would be more capital available to you correct to the skew towards capital investment in real estate over capital investment in, in goods manufacturer. So there would be more capital capital available to people there would be more programs To help first time entrepreneurs and particularly people of color, start new businesses and you know and access both the knowledge and the capital that was necessary to start their businesses.

**Interviewee B** 69:18

I think that the city could also use its own procurement dollars to buy. Good that were locally manufactured. That’s complicated. Because, right, I mean, it’s not going to be the lowest price that you got it, you know, you’re dealing with taxpayer money. And so there has to be like a kind of explicit acknowledgment that you’re trading one thing or another that I think you could make the argument.

**Tanya Tsui** 70:15

Hmm, that’s interesting. I haven’t heard that mentioned. But the interesting thing is a big like, solution for the circular economy is circular procurement of the government because if you say, well, the government is I don’t remember the numbers for the EU but it’s, you know, they, they, they are significant, I guess, buyer of right things. So yeah, okay, that’s interesting.

**Tanya Tsui** 70:48

Do you see manufacturers staying small All like the makers staying as small businesses or they all kind of agglomerate and get together and become a larger factory, let’s say.

**Interviewee B** 71:13

I don’t think that it would mean that it would probably be in the ideal scenario, it would be large numbers of small and medium sized enterprises. That, you know, that were that were interested in kind of a double bottom line. Right. So that they’re that they are triple A, that wanted to they wanted to be employers in particular places. And you know, so that would lead them you know, not to seek to be acquired.

**Tanya Tsui** 71:49

Hmm, yeah. Could you please explain what is double bottom line?

**Interviewee B** 72:00

very quickly, but it’s the idea that you know, you have your financial bottom line which is return on investment, you know, then you have your social bottom line, which is sort of returned to the community, whether it’s by providing jobs a good wages, providing, you know, and beat the taxpayer. That and then

**Tanya Tsui** 72:23

Okay, okay, I should check this out. Okay, clear? Um, I think is is there anything else you would like to add to everything we’ve discussed? I’ve gone through all the questions now.

**Interviewee B** 72:39

I think you asked very good questions. I covered it very thoroughly.

**Tanya Tsui** 72:42

Okay. Great. I was really great talking to you. I learned a lot because, you know, you are, you know, economic geographer and I’m more from a spatial point of view. And so that was really helpful for me. If there’s nothing to And this interview is is over and out our clean up the notes and then I’ll send it to you. It might be a bit it might take a while because I’m working on another deadline right now and I have some other things happening. So it might be a bit yeah might be April and to live see it.

**Interviewee B** 73:20

Whenever whenever you whenever you’re able to do that. That’s fine. Yeah.

**Tanya Tsui** 73:24

Okay. Thank you so much, Interviewee B.

**Interviewee B** 73:28

You’re welcome.

**Tanya Tsui** 73:29

Yeah, take care. You too. Okay. All right. Bye.

Interview C

Fri, 4/3 1:17PM • 59:11

**SUMMARY KEYWORDS**

Manufacturing, cities, urban, products, people, factory, scale, area, London, processes, polluting, big, bit, Sheffield, density, thinking, Preston, space, sustainable, cutlery

**SPEAKERS**

Interviewee C, Tanya Tsui

**Tanya Tsui** 01:09

Thanks for accepting this interview, even though I know you’re extremely busy. So I will be recording this interview transcribing it and then I’ll be sending it to you to check if there’s any factual errors. Is that okay with you?

**Interviewee C** 01:25

Yeah, okay. Yeah, no problem.

**Tanya Tsui** 01:28

So this interview will last something like an hour or 45 minutes, something like that. Let me introduce the whole project again. So what my project is looking at the common drivers and barriers for circular economy in cities and urban manufacturing in cities. The interest in the PhD is similar to the ideas in cities of making.

**Tanya Tsui** 02:22

A lot of ideas about circular economy in cities requires introducing industry into cities again, in the form of either local production or circular industrial activities like recycling remanufacturing, etc. And meanwhile, there’s this other group of people, mostly based in the US who are investigating urban manufacturing, but mainly for economic development or local job growth opportunities. So there are organisations like urban manufacturing alliance in America, or all these kinds of research on how to reintroduce manufacturing into cities. I thought these two topics are really related, but they’re not super connected to each other. And the two groups seem to not be as connected as they should be. So that’s kind of the foundation of my interest for the PhD that I’m doing.

**Tanya Tsui** 03:24

So the first paper that I’m writing is a combination of three things. One is like a literature review of common drivers and barriers for these two topics. And then I’m interviewing a bunch of experts on the same question. And then I’m also doing some workshops within seven European cities that’s based on the project that’s funding my PhD. So it’s from three sources, trying to understand common, let’s say drivers and barriers for these two topics. So let’s start with defining the two concepts. So how would you define circular economy in cities?

**Interviewee C** 04:22

As opposed to just circular economy? So circular economy in cities is what you’re thinking about.

**Tanya Tsui** 04:27

Yes.

**Interviewee C** 04:29

Okay, so I think that you could kind of start from the from the back end and say, what you’re trying to do is not have resources leave the city that could be useful within the city. And then you could go back round to the start and say, you want to reduce the amount of primary resources you use within the city, and then the processes within the city, try and reuse the resources from within the city so that you don’t need so much primary resources coming in.

**Tanya Tsui** 05:08

So two perspectives The, the front end and the back end. Right. That’s clear. What about urban urban manufacturing in cities? What is the limit of that?

**Interviewee C** 05:30

So, you know we’ve done the cities of making project and you may also know we spent days really discussing what urban manufacturing is. And we came to some conclusions, but I think we had a particular definition that we were happy with in the end, and it was along the lines of transforming materials at scale, into products that people need, within the cities. So something along the lines of having making a product from some other things and doing it at scale. If you’re just doing it at a very small scale, it’s just kind of craft rather than manufacturing. And this means it could include things such as sandwich making, as well as the old products, say, steel lids for for drains, steel drain covers used to be made at cities.

**Tanya Tsui** 06:44

Okay, so, so anything at scale, what’s the number that would be at scale?

**Interviewee C** 06:57

It’s a good question. I don’t know if we really got our teeth into that one particularly. But I guess a local bakery is probably on the edge of being at scale. So we’re sort of talking about bigger than neighborhood, I would guess. So the the, the customer base would be bigger than the neighborhood maybe. I’m just thinking about the local bakery, where I am now is probably catering for sort of 2 to 300 people maximum. And that’s probably right on the edge of what scale is. So let’s say bigger than 500 is scale.

**Tanya Tsui** 07:50

Okay, because I can imagine that also depends on the the type of product. As for the urban aspect, what counts as urban? Is it actually in the city centers? Or do you also count factories in the periphery of cities?

**Interviewee C** 08:12

Yeah, then we are starting to get into issues of density of people, I think what I would count as urban. So once the density of people gets high enough, there’s enough people to make it worth doing certain things. So the customers are dense enough to provide a market. And this is ‘pre’ - the virus. Density was important then, but post the virus, it’s now less important. Anyway, that’s a different different argument. But I think at a certain level of density of people, it becomes urban. And it’s probably, again, just thinking about where I am at the moment a thousand people per square kilometer something in, in that kind of scale rather than 100 people per square kilometer.

**Tanya Tsui** 09:11

That’s weird. This is talking about where the customers are right, but the actual factory.

**Interviewee C** 09:21

I think that’s still that’s what urban is for me. It’s a sort of density of people. And when you have that density of people, then it will support offices, businesses, manufacturing industries, that kind of idea. I guess.

**Tanya Tsui** 09:39

What I’m asking is, um, you know, you have, let’s say, for London, you have the London City Center, and then you have the London Metropolitan area, which is the size of the Netherlands. And what what, what kind what is the urban area you’re talking about?

**Interviewee C** 09:56

Right. Okay. So Well, I think it would go I think you could get some urban areas in, in locations outside the center of London, where the density is increased again, for example, Croydon is a sort of urban center, but it’s 20 miles outside the centre of London. So I think if you were going to say right, where does urban stop as you go out from the centre of London, it’s not quite so simple because it’s is this sort of local town centers that are quite urban also.

**Tanya Tsui** 10:34

Yeah, yeah. That you are so in the research of cities of making so you’re only looking at factories and companies that are based within areas that are have a certain density or is it you know, it could be the factories outside of that dense area, and then it services that area.

**Interviewee C** 11:00

We look at three cities. And we look to areas within those three cities. And I think we will probably get on the edge of, I suppose in certainly in London, where at least one of the sites could have been considered suburbs in terms of what it looked like. But it was more urban, in terms of the manufacturing that was present there. So I guess that’s true. And that starts to lead to probably your next questions, which is when the factory got too big, it had to move out of the densest bit of the city. So it’s by nature, there wasn’t enough room for it to be where it might have wanted to be.

**Tanya Tsui** 11:53

Yeah, but you would also define that as as urban manufacturing,

**Interviewee C** 11:57

That’s a good point. I think again, that’s sort of on the edge. Really, if you have to put a factory in a suburban area, it is clearly not as dense as the manufacturing might be. Or not as dense an area as sort of more urban areas.

**Tanya Tsui** 12:19

That’s clear. So, the rest of the conversation will be about drivers and barriers, and mainly looking at drivers and barriers for people that make things and also people that support the people who make things. So I see like the city’s having two kinds of stakeholders. So what would you say is the main drivers for urban manufacturing?

**Interviewee C** 13:02

Just sort of preface this with the concept of this virus, which is changing everything. So we are talking about the pre virus age rather than where we are now - about two weeks into lockdown in the UK. And the concept of of what the good bits are and bad bits are, are changing quite rapidly. So I’m going to say what I was thinking before the virus rather than what I think might happen after the virus, if you see what I mean.

**Interviewee C** 13:39

So the the drivers of urban manufacturing are the fact that the jobs are close to where people live. So density of people means that there’s people available to work in the factories or in the manufacturing process. There’s customers at a sufficient density to provide a market for those products. And it’s actually making me think again about scale. So by having a sufficient market that allows you to buy equipment that can make things at scale, which means you get the economies of scale, which means you can make more products for less money. So therefore, a sort of virtuous circle - you need the people to make the product for, and you need people to provide enough money so that you can invest in machinery to make the product or the process to make the product let’s say.

**Tanya Tsui** 15:00

Why would you have to be close to your customers?

**Interviewee C** 15:05

The logistics of moving product to people... Obviously, fresh products are the ones that are most necessary to be close to the customer. So if you have a fresh fish, something based on fresh fish, you don’t want to try and transport it too far. So that that would be the kind of most obvious example. Another one might be very heavy things. So you don’t want to move them too far because they’re very heavy. So Concrete, thatching, glass, that kind of thing. It’s just using those as examples. So heavy or fresh would be the two examples.

**Tanya Tsui** 16:03

So is there any benefit to the city in terms of urban manufacturing? For Is there any, let’s say motivation for municipalities to encourage more urban manufacturing within their cities?

**Interviewee C** 16:25

I guess you probably studied it already, but the city of Preston is quite interesting. In the north of UK, where they were, they’ve got a lot of students. So this is effectively a market or a or a bunch of consumers. And what they were trying to do in Preston is keep, wherever possible, buying local things. So you keep the money that the students would spend within the sort of greater Preston area by encouraging first the local authority to buy local all the time. And then that will also mean that local products are easier to get, which means they’re better for the students. And so the city of Preston has more local money there and becomes more economically active itself.

**Tanya Tsui** 17:25

Yeah, that’s quite interesting. Is there any arguments for that it being more sustainable, because I always hear, local production is more sustainable because there’s a shorter supply chain, because there’s less transportation cost, but I don’t see a lot of actual proof on that.

**Interviewee C** 17:46

I think there you start to get into what the word sustainable means. And that could be a whole new PhD all itself and that has been for many other people. What I’m interpreting you to be saying about sustainability thinking more about the environmental issues mainly.

**Interviewee C** 18:09

And I think some things well, once you get up to a certain scale in manufacturing, things get cheaper. So, logically, if you made it bigger and bigger, bigger scale, you could get cheaper and cheaper and cheaper. And so at some point, you get to the point where you’re a kind of monopoly, where you are the biggest person making everything and you can make everything very cheaply. So in a sense, it’s it which also might be very low environmental impact per item.

**Interviewee C** 18:40

So China has been making everything for the west for a long time. They’re very good at it, and they make a lot of it very cheaply from once and so that in a way, while the argument might be they’re using dirty power to make it they aren’t using as much power or energy to make a product as we might over here, if we don’t make as many of them. So the argument about sustainability is quite complicated. Just even just in terms of environmental, but there’s also issues of economic and social sustainability. Whereas the Preston idea, maybe less sustainable in terms of energy, because you, you’re not making so many of the things. But it’s probably much better economically because you’re keeping the money within Preston rather than going anywhere else. And socially, because you’re keeping the jobs within question. And people will feel happier about buying local goods.

**Tanya Tsui** 19:47

Yes, the question that I was asking was about environmental sustainability because I noticed that within the literature for urban manufacturing, it’s very strongly supported by social and economic sustainability. And then they also talk about environmental sustainability, but kind of as a side note, and there’s not a lot of thought on onto that. So that was kind of what what interested me about the topic actually. Would you say that there’s certain types of products or certain instances where it’s more or less environmentally sustainable?

**Interviewee C** 20:28

Definitely. But I’m just I was just thinking a bit more about history about how what urban manufacturing was in 1800, or something around that kind of time in London, for example, was there were lots of kind of polluting products being made. So steel Works, brick works, all sorts of other things. So there was urban manufacturing, that it was an incredibly polluting and took a huge amount of energy. And so that was shut down, because it was polluting and noisy. And so while it wasn’t environmentally sustainable at all, but it was in the city and that was where people wanted this stuff.

**Tanya Tsui** 21:29

Is there any kind of product or instance where it’s more environmentally sustainable?

**Interviewee C** 21:36

Yeah. So this was our argument along the along the urban manufacturing cities of making project was thinking that the old products which were manufactured in noisy, polluting, smelly let’s say less environmentally friendly ways may not be the right product to make in cities. But the new processes or to allow manufacturing within cities, but without the noise and the pollution and the environmental problems of the old products. So, 3d printing is the thing we were looking at before. So you have a small machine that can make, let’s say pretty much anything relatively quietly with very little or no pollution or noise, which is very different from how things used to be made in the past. So that that’d be one example.

**Tanya Tsui** 22:35

Yeah, what kind of products would come out of that?

**Interviewee C** 22:45

Well, let’s say things like small plastic pieces. So a bit some bits and pieces of plastic that people have all around the houses. So you could make those kind of things. It could be... blades for food processes something like that

**Tanya Tsui** 23:18

and have you seen examples of these in cities? What what are the kind of manufacturing companies have you seen in the cities of making project? Are they are they using these new processes like 3d printing or CNC or laser cutting these quieter manufacturing processes?

**Interviewee C** 23:43

We have seen some Yes. I’m trying to think of what the as an example, I can’t think of an example at the moment but I am pretty sure that there are some like if I think of so come back to you on that. So I can think of the smaller scale ones more like the Fab Lab type things. But then the actual high tech production of things within cities. And maybe Brompton bicycles is the one we normally go for, I guess.

**Tanya Tsui** 24:22

I can. Okay. But this is this is we’re talking about pollution and nuisance for people living next to the factories. But what about the in terms of environmental impact, like the carbon footprint of products? Is there any proof or idea that manufacturing things within cities is more has a smaller carbon footprint than say manufacturing in in a faraway, developing countries?

**Interviewee C** 24:59

Yeah. I think it would have to be a study per product, as it would be very difficult to say in general. But for for certain project products it will be much less footprint than others if you’re in the city and the other way round for some other products so I’m thinking about a sandwich making kind of idea where you have a factory making lots of sandwiches all at once. And that has economies of scale compared to a small sandwich shop where you making everything by hand at the same time by hand one by one rather not by machine lots at once.

**Tanya Tsui** 25:47

Yeah, cuz Yeah, that’s so that’s not something that was investigated by the cities of making project?

**Interviewee C** 25:55

We didn’t look at energy consumption per product, and compare that within cities to without cities. Just an extra point on that. One of the problem here is the the broadness of the term manufacturing, because it does cover such a wide range of processes. That if you want to be general about it, it’s quite hard, because not all because of manufacturing is so broad a term.

**Tanya Tsui** 26:44

I’m also thinking about this idea that in urban manufacturing, where you’re closer to waste flows. Would you would you categorize, repair or recycling activities as urban manufacturing as well? Or is it always manufacturing things from scratch?

**Interviewee C** 27:58

we’re, I don’t remember that. discussion we had about it, but I suspect it was along the lines of repair is a bit individual. And so the scale is not big enough to be counted as manufacturing. Remanufacturing, where if you had hundreds of pumps that needed a similar sort of process done to them, then that could be called manufacturing. I think some of the recycling probably could be counted as manufacturing. So there was one place that we saw that was turning waste plastic into new food containers, for example, so I think that is manufacturing. So again, I think it’s, it’s there will be examples where it is an examples where it isn’t I guess,

**Tanya Tsui** 28:52

Would you say that having these recycling or remanufacturing processes within the city is more efficient for the the organization, or is it better that we send all the plastic to China (even though we’re not allowed to do that anymore) but send it all to China and they process it all?

**Interviewee C** 29:17

Well, I think again, this it’s an issue of the product and the scale. If you have let’s say, these tiny little button batteries with lithium batteries for watches and things like that. So they’re kind of the size of a euro. You need quite a lot of them to make it worth setting up a recycling plant for for them. And you could imagine one, you could get one plant for the size of the UK, for example. And that might be all you need. Because we once you’ve got the process, then you you can imagine you could do lots of them all at once. So it might be that something like a battery processing plant could be somewhere a long way away. Because the product is small is reasonably high value, but it’s quite fiddly and which require high expense to set up the equipment to recycle it. So, for that case, it’s worth sending it a long way away. But for something that’s relatively simple, like taking nails out of a bit of wood, but doesn’t need to be sent a very long way to be done. So that could be done nearer the source of the of the waste. Is that is that clear?

**Tanya Tsui** 30:47

Yeah, that is that is. But I’m also just because instinctively you would think that the labor costs in a faraway country would be so low that you could it makes sense most sense to send anything all the way to a developing country because it’s cheaper to send it there and have really cheap people disassemble it a recycler, rather than have it here save on the transportation cost.

**Interviewee C** 31:20

It’s all about value. The value of wood sent from here to, let’s say Africa, the nails being removed and then the wood and the nails being sent back here. So the value of the wood isn’t high enough to make it worth doing that. But the value of the batteries might be high enough and it’s a sort of value versus material density calculation, because you’ve got to ship this stuff back to wherever it goes, or you’ve got to ship it there and ship it back. So if it’s a relatively low density product like wood and with low value, it’s different from something like a lithium battery which is high density and very low volume. So you’re gonna you’re gonna get more material in your ship effectively and more value. So I think it becomes really quite an economic question, which is a lot of the case to be honest around the whole issue of circular economy.

**Tanya Tsui** 34:05

someone kind of studied manufacturing in New York City, and they found that one of the only surviving activities in the New York City is diamonds because of the the value to to area ratio is so high that it the only diamond manufacturing companies can afford to...

**Interviewee C** 34:31

Yes so the sort of products you need for diamonds. Diamond cutting is the same in London and probably the same and the same in Rotterdam and Antwerp. I’m sure the the value of the product is high, the volume of the product is very low. And so and the actual equipment you need to cut it is quite small. So you’ve you can have you don’t need very much land area to set up a diamond cutting business.

**Tanya Tsui** 35:06

Yeah, it’s like one big room basically.

**Interviewee C** 35:09

And the only people who can buy them are the ones who have... well the money’s in the cities, basically. So that’s where your customers are in the cities as well, for the diamonds, Probably so. But yeah, I think that’s a good extreme example of one end. And whereas you have probably the other end - sewage processing plants being outside the city for similar sort of reasons, I guess. They’re both in the opposite end.

**Tanya Tsui** 35:43

I would imagine a big barrier for urban manufacturers is space. It’s just so expensive that

**Interviewee C** 35:49

Yeah, so getting into various sizes. So that’s exactly it. So space is the expensive thing and in successful cities, space is very expensive. And you could look at Detroit for the other way round, where they had the car manufacturing the city, and that became less successful. And the city failed because the the manufacturing failed. I mean, there’s a whole new argument. I would say it (Detroit) needed a massive amount of space for these cars. And if the car industry collapses, there’s no no can use all that space all at once. There’s a long discussion about that in Eindhoven, they’ve had to deal with the fact that Phillips Lighting pulled out of that area and I expect Eindhoven wasn’t very successful quite for quite a while. And possibly even now you could look at it and say, the reason they’ve got the space for Dutch Design Week is because they’re missing a giant factory in the middle of it. And that’s why it’s become good for Dutch Design Week. Anyway, so drivers would be cheap space. And barriers would be expensive space.

**Tanya Tsui** 37:36

Is it something that you guys observed in in the, in the cities of making project that the manufacturers struggled with finding the space? Finding space?

**Interviewee C** 37:51

There’s actually quite a bit of super small startup space and there is not very much space for this sort of medium sized businesses to scale up to urban manufacturing, there’s not very much space in that kind of scale. I think that was one of the findings. So, to move from startup, to prototype, to sort of full scale manufacturing, you need a bigger space and there are less of those spaces around that are suitable.

**Tanya Tsui** 38:30

And what happens then when a company scales up, do they move outside to the outskirts or do they go to another country?

**Interviewee C** 38:41

I think they can do to two things really. One is they could try and stay at the same place and become more efficient somehow. Or try and move up the value sort of ladder and see if they can increase the value of their products while staying in the same place, so made in London, using that as a brand to try and increase the value or to get space, they’re going to have to move outwards and how far out they move, probably just an economic decision and based on how far the workforce will move. If the workforce is really important, then they can’t move very far. If the workforce is not so important, then they can move a bit further. So those are the sort of issues that need to be thought about, I guess,

**Tanya Tsui** 39:34

what would make a workforce important?

**Interviewee C** 39:41

Diamond cutters for example, the key you need to have people who’ve experienced it cutting diamonds are not going to muck it up when you give them a very expensive bit of raw diamond. So their job is presumably quite stressful. And the experience is everything. So you wouldn’t won’t be too far off for them to move. Removing nails from a bit of wood is not a high skill job. So that is the level of skill and experience really would make the people more and more important or not. But it’s also, if you’ve got a really good team, you might really want to work on how to keep that team together. So it may not just be the skill, it may just be how they work well as a team.

**Tanya Tsui** 40:42

Is there anything that the municipalities did to encourage urban manufacturing or are they just not interested?

**Interviewee C** 40:53

Oh, Brussels is the big example. Really. Because it’s got this massive Audi factory in the middle of it, then that sort of drives a lot of Brussels. So it is massively in their interest to make sure that your Audi factory stays so they must spend a lot of money subsidizing the factory, but we didn’t really look into that kind of level of manufacturing, really. In terms of incentivizing urban manufacturing, I think it’s a new world really, and cities of working out how to do it. So for for Rotterdam, and London, there is manufacturing there. And it’s sort of encouraged in industrial parks for example. And, but the there hasn’t been much effort to increase urban manufacturing for example because of the pressures towards residential. I don’t know, Rotterdam very well. But I’ve seen some of it, Rotterdam have been regenerating around their docks. And so if the processes around the dock was manufacturing, which some was certainly manufacturing, then by regenerating they’re actually reducing possibilities for manufacturing. So they’re regenerating is increasing residential, but as a process, probably reducing manufacturing, but I think the compass is turning a bit more back towards manufacturing.

**Tanya Tsui** 42:48

why do you think that what would be the case?

**Interviewee C** 42:52

Because we’ve been doing the cities are making projects and we’ve been very optimistic, haha. That’s how we’re seeing it.

**Tanya Tsui** 43:01

So why would be city be motivated to incentivize urban manufacturing?

**Interviewee C** 43:08

I think that kind of Preston idea is quite interesting, saying, “right, okay, we want to make our city be known for X Y or Z.” And so they they may well want to promote some particular kind of manufacturing for example, and then their city becomes known for this thing. So Sheffield was known for cutlery - knives and forks - so that, that’s the idea of Sheffield steel. So people knew that that was an important thing for Sheffield. So I think that would be one reason to do it, to become a center for something and then that improves the economy of your city.

**Tanya Tsui** 44:00

So is it is this also how you would see it that each city would kind of have its own special product? Or is it that it would encourage all kinds of different products?

**Interviewee C** 44:13

I think it would work is more easily to promote along a particular line. So it would generally be supporting an existing industry rather than encouraging a new one, I suspect. So, for example, for Sheffield steel, they’ve already got the reputation for producing cutlery and steel. So they don’t need to work on that. But they do need to make sure that cutlery makers can still be there. If they were going to try and re relaunch the brand of Sheffield cutlery or Sheffield steel.

**Tanya Tsui** 44:27

Also, try to know like it’s easier because this is existing skills. And marketing and branding ready for Sheffield cutlery? So it kind of makes sense to go back into that.

**Interviewee C** 45:06

London has done this actually in a way, they were doing this thing around the roundabout in East London called Silicon Roundabout, or at least they were trying to encourage that. So they’re trying to encourage high tech industry in to a particular area of London. And so certain measures could be made to do that. So I think that’s, that’s the kind of thing that could happen. So you could say, we want to be great at pharmaceuticals or something or some or robots or some new thing. And you could say, right, how are cities going to be good at this because we’ve got a few people who know how to do some electronics. We got a few people who do, how to do mechanics, we know how to make wax models. So we’ll try and do robots. So I can imagine that that that might be a way people would think through what they might want to do.

**Tanya Tsui** 46:13

So you notice this also in East London.

**Interviewee C** 46:16

So there are examples. So this was a smaller example: I’m not sure if that just emerged, or whether there was a particular push from the government. Old Street used to be a kind of a cheap area of London. And small startups came in, and they turned out to be quite high tech startups. And therefore, you could encourage them to continue and try and brand it and make it even more attractive to other high tech startups. So it’s a bit sort of chicken and egg type of thing.

**Tanya Tsui** 46:57

Yeah, yeah, I can see I can imagine well, Going back to this city branding as like a as one industry. What about in Brussels with the big Audi factory? Did you guys observe that there was other kind of spin off car related manufacturing?

**Interviewee C** 47:18

There was a lot of car related things going on in Brussels actually. So they had a they’ve got a very big area with secondhand car dealers, which isn’t really manufacturing but there’s lots of people fixing up cars and sending them to Africa. There’s a sort of whole industry around car parts and fixing cars and shipping cars. And so I think that is it’s with a big company like Audi, you’re gonna get associated things attached to the factory so that we weren’t really looking at the big factory that was already there. But did mean that there was more auxiliary type companies around. So the big thing had the ecosystem. And again, if you look at Detroit, I’m sure there was a massive ecosystem around General Motors and once that was the big car company goes bust, all the other places go bust, so that becomes a risk. If you set up around one industry and that industry turns out to be wrong for some reason.

**Tanya Tsui** 48:29

I’m almost seeing it as like a huge animal and then all these little parasites that are feeding off it.

**Interviewee C** 48:38

I think that I think that’s the case for the one company towns, which is exactly that. So if the, if the animal dies, then the parasites are not going to do very well. And that’s why the bigger cities we can be more diverse cut more of a chance of surviving disasters.

**Tanya Tsui** 49:01

Yeah, but for example, with the Brussels example, how, what was the motivation of these auxiliary activities? Do they get stuff from the big factory? Like the waste flows or skills?

**Interviewee C** 49:17

I don’t know... I expect to get skills actually. So you’ve got skilled workers nearby. And you can kind of hire them.

**Tanya Tsui** 49:31

That was something that I noticed in my master’s project. We were looking at a, like a Peri urban area in Indonesia, where there was a huge textile factory, and all these people moved in and live next to it. And then there were all these tiny little workshops within the surrounding village where people because people gained skills and started making and clothing, starting little workshops, taking the waste fabric from the factory and then just sorting and making secondhand clothes out of it and things like that.

**Interviewee C** 50:12

So it again is the idea about having that sort of big animal everyone’s living off. So the whole ecosystem around the giant whale sort of keeps the whole society going. You probably could argue about cities really, of keeping a massive army of cockroaches, rodents, foxes, all of that kind of stuff living off the waste of humans here.

**Tanya Tsui** 50:53

I see that it’s almost times up. So I’ll ask one last question, and then we can stop. So, after the research you have done with cities of making, how do you see the future of manufacturing in cities?

**Interviewee C** 51:13

I think the idea of quieter, less polluting manufacturing is going to be a thing. So we were more or less there already. So I think that means manufacturing can be closer to residential activities. And I think that is very likely to increase. The moment we can make 3d printers so small you can have them on your desk. They are, very, very quiet and very un-polluting. And the larger scale processes are probably still noisy and still a bit polluting, but will become less noisy and less polluting. So I think we can expect to see more manufacturing, in the cities. And the idea of customization, which is sort of against urban manufacturing... It’s a cost issue and I can see small customization but the basic bits requires standardization. So that leads to scale. So electric plugs being one example. So all the electric plugs in the UK are standardized. So so you could have one factory making electric plugs, something like that. But so I think urban manufacturing is likely to increase in scale in cities as we work out how to make more bits. Quiet, more quietly, less pollution, less energy, and ultimately less cost per piece. From waste material.

**Tanya Tsui** 53:36

Is urban manufacturing a smaller scale than offshored manufacturing?

**Interviewee C** 53:50

But I think it has to be just because of the cost of space.

**Tanya Tsui** 53:57

So in the future, it can’t be that all of our products are produced from urban manufacturing. Right? So there must be some, still, that’s offshored.

**Interviewee C** 54:12

And so it’s a scale and money thing. So it’s very true. So some big things you’re going to have to make outside the city. And some small high value things you can make inside the city. So it’s a sort of value gradient of what things get made in the city and how close to the center of the city can they be made and still be cost effective, I guess. In terms of all sustainability, the economic, social and environmental calculation to work out is, is it worth making it closer to the city or not? It will come down to that. And it’s not just environmental or just economic or just social So it needs to be all three.

Interview D

Tue, 5/26 9:48AM • 26:59

**SUMMARY KEYWORDS**

Materials, people, factory, city, infrastructure, maker spaces, labs, fab labs, starting, world, plastic, create, micro, produce, model, urbanist, developing, sustainable, fab, fab lab

**SPEAKERS**

Tanya Tsui, Interviewee D

**Interviewee D** 00:01

Yeah, just supposed to meet up with a Dropbox account I think is where it starts the video. Okay, maybe take some time?

**Tanya Tsui** 00:10

No, it’s fine. I can record on my phone. It’s worked for previous interviews. great. Um, how’s it going? So you’re stuck in Indonesia then?

**Interviewee D** 00:23

I’m conveniently stuck in Indonesia, yeah. We made a decision with my partner to stay here. I was here by coincidence, because I was in a conference in the Philippines and yeah, the globe and then it started and somepony was about going back to them messy Spain or, or staying here with the risks. It takes a reversal here. Maybe Yeah, that’s probably a good decision, actually.

**Tanya Tsui** 01:04

So I’m okay. The Netherlands is Yeah, pretty relaxed with the pandemic. So I’m working from home but, you know, yeah, there’s not a lot of restrictions here. So it’s not so bad.

**Interviewee D** 01:19

Girlfriend This is from Maastrict. Okay, cool. Yeah, we have the following.

**Tanya Tsui** 01:28

Right, right. I see. Cool. Um, well, since we have 20 minutes, let’s start. I would say. So, my research is looking is connected to the Pop-Machina project, and you know about it now. And so I’m exploring how manufacturing things in cities are making things with city can contribute to circular economy. So that’s the questions I will be focusing on today. Let’s start with how how you think, fab labs and making things in cities can contribute to sustainability. So So I asked a similar question in the Pop-Machina meeting, and you start off, yeah, you started off by seeing something interesting, which is it makes the supply chain clearer, like kind of more transparent. Could you elaborate on that? Or?

**Interviewee D** 02:26

I can, you know, I would support some of it. I would share with you the presentation afterwards, because I think I will refer to certain things that it will take maybe too much too much time to completely elaborate, like the Fab-city full stack and so on. I’m but referring to that. You’re asking me like, you know, how fab labs and or Fab cities can contribute to sustainability, you know, yeah. And I believe that that’s part of our work like, you know, we have been helping to develop the Fablab network during the last 15 years, more or less. And, you know, I’ve seen how we, when we opened up Barcelona, back in 2007, there were 10 fablabs in the world, roughly speaking. And I’ve seen how that number grew up to a couple thousand. And then if you are to doubt the amount of maker spaces, you can, you know, we knew you can get easily in hacker spaces, you can get easily to numbers that are quite, you know, big. And more importantly, you can see that almost in every major city. There are such place these kind of spaces that they didn’t exist before, just 20 years ago.

**Interviewee D** 03:44

The interesting thing about these spaces is like as you can compare them to what places where you would go to use computers were like 25 years ago, so you were going to a place like a cyber cafe to use a computer or get to the internet. So fablabs and maker spaces are something like that, but very different. For me the clear message that we’re seeing now, inside the Fablab network is that one of the main problems of this of how cities operate today is that they are like a huge consumer of resources, right?

**Interviewee D** 04:26

I usually use like the metaphor of a city as an octopus, because the city limits, it doesn’t finish in the political boundary or even in the physical boundary, where you pose you know, this is where the municipality or the region or the city finishes. It’s actually connected to the world because it is constantly sucking up resources that travel thousands of kilometers in order to satisfy what people need, right. So most of us have seen that we are using in our everyday life, like probes and things and consume food and consume electricity, that we cannot see where they come from. But they become the primary use things of life, like of course, necessity. And these core necessities are satisfied, again, very far away from where we are.

**Interviewee D** 05:23

So what happens? First of all, like under this model, you are more dependent to externalities or external factors and you cannot control. For instance, a collapse of the Communist Party in China that starts a strike of workers that are caught the supply chain of Amazon, in many places in the world, right? And then you will wonder why I am living in you know, in Amsterdam. Why a strike of workers in China is affecting, you know, my work because I cannot get the computer that I need to run a PhD.

**Interviewee D** 05:59

So, that’s why have these kind of dependencies, you’ll get dependency creation that you that we have now, with these, the mode in which we are operating now, the other thing is like as externalities are hidden, and part of the whole model in which you know products are traveling around the world is based on that, and externalities are related, you know, with labor or the energy to power and to move things to power machines and to move things.

**Interviewee D** 06:29

And then supply chain, including raw materials and then the distribution of problems. I’m saying labor because you know, we want to pay to produce, and in order to have to produce, you need to have cheap labor assembly. Those products, a lot of the work that we call automated, actually, there’s a huge amount of the work is automated, but it’s a huge amount of involvement of human beings and putting the assembly putting the screens on on an iPhone. No, no Putting the finest plastic on a corner of a screen that we like to take out from the devices that we like. And then also, I was telling the other day when we were talking in the Pop-Machina meeting, that also the supply chains I mean if you trace a copper if you trace cost down if you trace and aluminum, that leads to highly environmental or social conflict in some way that these very intense intensive extraction of materials leads to conflicts that you know that are related with with other human beings or conflicts related with ecosystems or the biodiversity.

**Interviewee D** 07:45

So, your why I think that, you know, these Fablabs can help to change this because they are starting to show us a new way of making the world is keep staying connected. But at the same time, being able to reduce significantly some of the worst parts of globalization, which is the moving of heavy things, using highly polluting energy, and creating this sense of cheap things that are not (actually) cheap. So right now in these 2000 plus Fab Labs is possible to share files of the science of very simple things at the moment, but starting to be more complex. Furniture, twenty / ten years ago, or the furniture designs or prosthetics are one of the things that people were sharing and downloading and replicating and adapting and modifying in Fablabs. To now, we’re going into much more complicated things like sensors, machines, even not only making products but also making the technology which for me is fascinating, fascinating.

**Interviewee D** 08:56

So this notion of creating a distributed network of infrastructure capacity to keep local production happening, using local materials, while simulating information globally, for me, is almost like the only way to create a more sustainable and a more viable world for cities. And at the end, that’s where we need to put all our energy and I’m committed... my life is committed to that. That’s why I say that sustainability needs to tackle the way we consume, and the way we produce the things we consume. And also changing dramatically the infrastructure that we have been developing for the for the last 200 years. So we put a lot of money on developing technology and infrastructure to move things, trains, airplanes, airports, railways. Those are infrastructures that we have been heavily building in the last 200 years only on ships, so now we need to put more emphasis into infrastructure that help us to keep the heavy stuff at cities, with the local materials circulating again and again and again in the cities and the region, and then equipping citizen and cities with the unification infrastructure to help these materials to be turned into products that solve needs of people and not necessarily that they are responding to marketing strategies. Victor Papanek understand this much better than me, I don’t know if you know he’s famous book “Design for the Real World”, but

**Tanya Tsui** 10:41

sorry, can you say the name again?

**Interviewee D** 10:45

Victor Papanek.

**Tanya Tsui** 10:51

Okay, Victor papinek. I don’t know that person.

**Interviewee D** 10:55

“Design for the real world”. Hey, Yeah, I mean, we’re talking, we’re kind of our three sampling ideas of the past, you know, on the other people like Otto Neurath, which is an Austrian architect urbanist from the beginning of the last century, also saying these kind of ideas now. So I think that now is what about being able to implement these ideas into the real world, thanks to technology that where it’s made easy, more, more and more accessible.

**Tanya Tsui** 11:32

Yeah. Do you see a for example, the Fab Labs in your network or at Fab Lab, Barcelona, how much of the local materials that go through these fab labs are local materials and

**Interviewee D** 11:47

yeah, very little at the moment. That’s one of it. That’s it. Yeah. And, you know, usually in transition periods, you need to accept to live in these files in which from the machines to the materials itself that you’re using to transform. Finally, the way we produce things is actually based on the old way of producing things, starting from my computer for the rest of things that we use every day. But in the Fab Lab, even though there have been projects like precious plastics, that are enabling labs, to capture the plastic and turn into 3d printing materials, we are being more conscious about like, you know, the type of dressings and molding and casting materials and moving into more sustainable ones certainly has been a significant change.

**Interviewee D** 12:44

But I’ve seen that it’s not enough. I think that’s far less and maker spaces are still using a lot of plexiglass or plywood and are basically part of the problem. Yeah, But at the same time, they’re serving as these places where new materials are being exploited, where people are developing bio plastics, or replacing leather by kombucha leather, you know. So that’s a fascinating thing that, while they clean up this mess are trying to reduce the impact of the way they are hooked up to the traditional way of making things and fabricating things. But at the same time, the places where at least some people are trying to explore how to change this dramatically. That means like a change in plastic for bioplastics. That’s great. I mean more of that. Those are going to have things that are really that needs to happen more and we need to invest. That’s a problem when there’s very little investment on this infrastructure.

**Tanya Tsui** 13:53

So I would imagine the reason for bio plastics is because you can source the material Locally you could in theory that grow the thing, the plant that creates the plastic and then you turn it into plastic instead of taking oil from the Middle East and turning in plastic, right

**Interviewee D** 14:12

Or using restaurants, organic waste and then use that organic waste to grow to make like a certain material, (for example) coffee grinds mixed with orange skin or using the coffee grinds to grow mycelium that can be used also for many applications. Yeah. This is super interesting because you start to see like more and more and you know, all creating like these panels like replacing and you know the MDF, which is highly toxic. So, you know there’s a bunch of people working on developing for instance, kind of a circular material but instead of made of wood scraps and toxic plastic and glue, he’s using natural resins and the bones of the olives.

**Interviewee D** 15:09

So that’s the kind of things I want to see more. And again, they come. we seen them in the COVID-19 crisis. All these labs and makerspaces, they did an incredible work on supporting the medical staff and people everywhere in the world. There was a single lab that was trying to make a business out of it. Others were doing it for free, or at least at cost. So they are operating under a different logic. And I don’t know if that’s a problem or a benefit. Because I think one of the problems also is like to have industries that are only driven by profit, and then that’s what makes things more sustainable. And profits become more important than, you know, taking care of the water resources or taking care of breathing clean. It’s just stupid. I can’t think, you know, what a stupid moment in humanity right now how many people like Donald Trump or Putin or Maduro in Venezuela? Or the way in which we’re trying to go back in our minds?

**Tanya Tsui** 16:19

I also agree when you say that maker spaces are not sustainable enough, or it’s not the priority. So what’s stopping maker spaces or Fab Labs from being more sustainable or sourcing more local materials?

**Interviewee D** 16:38

Yeah. I think that they simply don’t fit with the craziness in which we are now in the current model of development, which, you know, the way of making money and ways of making money is totally absurd. Like, if you have people that want to make money, it’s actually the need to go over people or other natural resource. In order to make sure that they make money, that’s the only way because we have set up like a very twisted rules of the game is to be by cheating someone to be by taking advantage of something before anyone else and so on and so on and so on. Or is it stealing data from people.

**Interviewee D** 17:23

And then when you when you see, I mean ourselves. As part of this, you know, this (fablab) network, I can tell you that profit is something that is not the main driver. And the people know that they are not here to make money. They are here to learn technology, and then also put that technology at the service of humanity. And again, that was just proven now with all the face masks, and so on. I think that there is something about like a disconnection between models in a way. Like a “just for profit” paradigm versus the “Let’s try to fix things” and then we’ll figure it out later about the money. Now it’s more like okay, if it’s not viable monetarily... it could save the world, but if it doesn’t have a business plan that you cannot do it, right?

**Interviewee D** 18:14

That’s the stupidest thing in the world. And, the other thing as well, you can maybe demand labs and makerspaces to do more, try to be more strategic and read better their context and find partnerships and not just be obsessed with technology. I think that’s something that we can criticize. For the you know, the Fablabs, Maker spaces the maker community is just you know, with technology become just too shiny. Yeah. You, you are too much looking at the machine and you’re not looking across the street. And there’s probably something across the street that is the opportunity for you to participate in a project in which you create somehow that also trusted needed in what you do in order to get support or to find partnerships in something.

**Interviewee D** 19:16

And I think that that’s what we have done that as well what happens if all of a sudden the lab has been led by an Urbanist? I am an urbanist. So it’s something that teaches how to look at the city differently. And also by designers and architects and some engineers and something on it, you know, I think that that sounds like you know, fairly harmless, they need more design, for sure. And not just to make things prettier, but actually, to have a design mindset in life. You know, I want this not just about the technological challenge. It’s about you know, which is the kind of reality I want to enable when I create something and that’s critical thinking is not super common or sometimes comes just informally. We’re working on that is trying to bridge that gap. Hmm.

**Tanya Tsui** 20:10

We have three more minutes. I would say one last question is you also in the presentation talked about the different scales of, making in cities. So for the home maker space, industry and global industry, what are the roles that the Maker Space scale fulfills that the other scales cannot? So why why produce let’s say face masks in fab labs and not in a factory that is in the city?

**Interviewee D** 20:59

Going back to which kind of infrastructure we need to invest. We look at I see manufacturing needs a complimentary multi-scalared strategy of infrastructures that are interconnected between each other. And they can serve each other they can be. So you can have a personal fabricator at home that could be your personal 3d printer was probably at home you cannot have a CNC machine, so for that you have a neighborhood Fablab. But then you are not going to use the Fablab to be a micro factory, but you can have like a small micro factory in your neighborhood. And then probably there’s more complex things that need to be made using more advanced equipment. And for that you probably have a more technical factory with robots and expensive 3D printers. And then I think there will be things that you would need to still make in a highly standardized modern equipment, and still connected with some global supply chains, but that would be the minimum, and it wouldn’t it wouldn’t be like today in which most of the things were imported, right?

**Interviewee D** 22:07

So a fab lab, for me, it’s a social space. It’s a space to learn to prototype. But it’s not a micro factory. And it needs to be complemented with micro factories at neighborhood scale, and then flexible factories at city or regional scales or regional scale that are more specialized. So in that way, also, we need to start to think about what kind of material libraries we need, not just to classify, but also to store and also to create new material and to capture material, right. So the whole material, dealing infrastructure, how we deal with waste, how we turn into new materials, how we classified how we make available for these production ecosystem is another fascinating part of these are another fascinating piece of these ideas. Having a complimentary multi-scalar...

**Tanya Tsui** 23:10

but what what would you say is an example of a mini factory?

**Interviewee D** 23:15

a micro factory could be you know, just a modern more advanced... if you look at the fablab, the fablab has like one laser cutter one CNC machine making have a couple you know, but then the primary use is for people to learn how to use machines to prototype complex stuff to develop projects.

**Interviewee D** 23:36

But then you need probably to fabricate you know, maybe you have to make 25 speakers because because you have an order so, micro-factories is where you can introduce like this more on demand production of things that haven’t been developed before in the Fab Lab. And these micro factories can be automated, it doesn’t, they don’t need to, you know, they can include humans, but they could be automated as well. And I imagine then like still simple machine you know like a CNC machines but maybe more industrial or laser cutters that can cut bigger parts of equipment where things can get assembled you can have like a you know micro factory you can have a circuit machine you can make simple circuits, but then if you want to do more complex stuff, you know, advanced computation or advanced circuitry fabrication or more complex treatment of certain materials and you you you have you can have like a more specialized factories which I believe they can be flexible factories, because they can, they can be used to produce different types of things. Especially because we’re not talking about the standardised production, we’re talking about on demand, highly customized production, which, for which you will need a lot of less units than we produce now.

**Tanya Tsui** 25:00

Yeah, that’s true. Isn’t it? The the fordist model versus the just-in-time model. Do you have any real life micro factory examples that you think are doing really interesting work?

**Interviewee D** 25:32

I know, I’ve been seeing places I guess better examples, you know, in the United States, especially. If they are, they are not visible. They are. They’re everywhere. They’re there. You can see in any city, the several factories that are now for instance, a lot of them are idle, because the demand or production that they had 20 years ago, now it went to China. If you go to “make works”, which is a platform that we have been working on inside the lab and probably Alessandra showed you around, just send you the link. Then you could see some examples of more specialized micro factories for the scale of infrastructure I’m talking about.

**Tanya Tsui** 26:28

Thanks that that’s really helpful. And I see that we’re three minutes over time. So thanks a lot for the interview.

**Interviewee D** 26:35

Okay, Tanya, and let me know if you need anything else.

**Tanya Tsui** 26:39

Yeah, it does. It does. Thanks a lot. Silver. Alright, see you then. Bye.

Interview E

10/4 10:00 AM

**SUMMARY KEYWORDS**

Urban manufacturing alliance, community base organizations, legacy manufacturers, makers, networking, place-making, craft

**SPEAKERS**

Interviewee E, Tanya Tsui

Interviewee E 0:00

We are Yeah, I’m in Wisconsin and our governor, but we felt safer at home here but shelter in place about three weeks ago. So we’ve been we’ve been pulled up but I work from home anyway, so it doesn’t really feel any different.

Tanya 0:00

Okay, I see. I see. Nice. Well, I let me just before I start interviewing you, I should probably introduce the topic a little bit and remind you why I asked you

Interviewee E 0:00

Gee... I don’t remember at all.

Tanya 0:00

Yeah, I understand So actually, I’m, I’m based in the Netherlands and I’m doing a PhD in urbanism. And I’m looking at circular economy in cities. So I guess you’re familiar a little bit with circular economy.

Interviewee E 0:00

Yeah, you can give me more background if you want.

Tanya 0:00

Yeah, sure. I mean, it’s, uh, but it’s just the PhD started because in a lot of strategies for circular economy in cities, there is this push for reintroducing industrial activity back into cities, and either in the form of local production or in the form of some kind of recycling, remanufacturing repair, whatever. So on the one hand, there’s all this talk and strategy and papers about manufacturing in cities and on the other hand, there are people like you guys on the other side of the world. Talking about introducing urban manufacturing. But you also have a sustainability perspective. But I think in your world, it’s more about economic development and entrepreneurship. And I just noticed that these two worlds kind of don’t touch. And so the PhD is about seeing if these two worlds can learn from each other. And the PhD is funded by a European Research Project that’s looking to start makerspaces in seven cities, and to maybe scale them out in terms of production, and to see if they can contribute to the circular economy. So I’m working mostly with municipalities and ideas the PhD will be about, can you still hear me with the screaming kids outside? Okay, yeah. Um, uh, yeah, it’s about Looking at the drivers and barriers for different actors when it comes to this, this kind of vision of introducing manufacturing into cities, to Yeah, for the circular economy. And so the reason why I wanted to interview you was is Yeah, it’s probably quite obvious to you now. But yeah, I’m interested in looking at basically what motivates and impedes people from manufacturing things in cities and the perspective of you guys, which I would assume you’re more like a support organization for makers, and then from the perspective of makers and also maybe from the perspective of municipalities. So what what motivates these three people? These three organizations are types of stakeholders when it comes to manufacturing in cities and also whether it has some kind of connection or whether you In some way motivated by circular economy or other kinds of sustainability issues. So that’s that’s the that’s the context.

Interviewee E 0:00

That’s really helpful. Yeah. Ah, so you ma just really quickly, we’re a practitioner organization. So we have members who are serving makers and manufacturers. So what you said is just right, but we’re not really doing the direct service providing We exist to connect people who are so like our members are people in municipal governments, community based organizations, like maker spaces or CDC’s, we have universities, you know, port authorities, refugee centers, lenders, real estate developers, all those kinds of folks and anyone is welcome to be a member membership is free. And we’re really about just what you described as like using urban manufacturing as a wealth building strategy for communities, particularly low income communities through entrepreneurship and employment. So we do a lot of research, we do a lot of storytelling and then we do a lot of convening. So bringing these people together to learn from one another about the strategies that they’re using. So what you’re doing is really interesting, and I think really relevant.

Tanya 5:21

Okay, okay. I’m just I’m also taking quick notes. So I’m maybe pausing a bit. Um, okay. Okay, that’s, that’s clear. So it’s kind of a support organization for people who support makers almost.

Interviewee E 5:38

Yeah, we’ve been referred to as like a support group or industrial advocates, because so many of them are doing this sort of isolated and on their own and they have this need to connect to one another. So do you have questions you want to ask me or do you want me to just kind of like react to what you said.

Tanya 6:00

I do like.... have a set set of questions. But before I do start, I just want to clarify what you guys do first, what what are the kinds of industrial advocates like in different categories, let’s say.

Interviewee E 6:16

So kind of what I listed off at the beginning, so it could be in municipal government. It could be like actors and like a departments like a planning department, maybe economic development, which could be classified public, private, and a lot of places in the US. People who are like building physical spaces, so that could be like nonprofit or mission driven real estate developers. It could be maker spaces, commercial kitchens. We have a lot of lenders we have like CDFIs, which is community financial development institution, just sort of like a community focus bank. I don’t know if you’re familiar with them here.

Interviewee E 7:02

We have a lot of community based organizations like nonprofits, they might be doing like workforce development or education. Some are like, I don’t know if you’ve heard of the groups like SF made in San Francisco, like, so they’re one of our co founders, so we call them like a local brand. So we have a lot of local branding organizations. That kind of thing. So those are what I mean by industrial advocates and people working to support makers and manufacturers in a given city.

Tanya 7:33

Okay, very cool. Um, I think I have a rough idea of you and made? now. So I’ll start with the interview. And I’ll start with just seeing how you define two things. So the circular economy and urban manufacturing, just to know what we’re kind of talking about.

Interviewee E 7:54

Yeah, so for urban manufacturing, you know, it’s really about the production or assembly of physical goods in a given place, We take a really broad definition of urban. So it could be anything from a small city of a couple thousand up to, you know, New York or Los Angeles or we have some international members too. So, to us, urban is like a term around density around people, so doesn’t have to be the biggest city, it just has to have the right whatever that is number of people to sustain the industry. So it could be around one type of sub sector manufacturing or it could be across a number. So it’s just really about producing a physical good, assembling of physical good in the city and we’re sector agnostic. So we’re not, we’re not just talking about makers, we’re also or like, you know, ceramics or jewelry, we’re also talking about medical devices and big legacy manufacturers.

Tanya 8:54

Okay, so actually, um, is there so it’s makers. Kind of SMEs and also large manufacturing companies. So you don’t really focus on a certain group?

Interviewee E 28:30

I would say yes, and the one caveat there would be that most of the manufacturers that our members are serving are sort of the maker and SME, because of the fact that they are in cities and the legacy manufacturers need enormous amount of space there. Maybe they moved out to the suburbs, you know, one, I don’t know, in the 80s or 90s, if they didn’t totally, you know, go to a foreign country. So a lot of the manufacturers now that are in cities are, you know, require a smaller footprint, which enables them to stay in a city, if that makes sense. so makers or SMEs.

Tanya 28:30

Yeah....yeah, I think we’ll talk more about that. Um, how would you define this as craft all So something you guys look at so people doing one off things. Is that also manufacturing?

Interviewee E 28:30

yeah, I mean, I think there’s like that we call it like a spectrum, you know, there and it’s all sort of part of the same continuum. So you have the people at the smallest end who are craft crafters, not even crafters, but like crafts people, artists, designers, who maybe don’t want to commercialize their product, but they’re still sort of pushing the sector forward in terms of thinking about new ways of doing things or thinking about it in terms of like an art and arts and culture and placemaking way, then you have those people who are making those small batches of physical goods, but they want to commercialize, they want to sell their products, they want to make a living from it, whether they want to do it, you know, by themselves and just do it as like an entrepreneur or solopreneur. Or they want to like grow their business and have employees or they want to grow and sell their business to another group. So there’s really like that continuum and then you get into like the more traditional SMEs, like the machine shops and that kind of thing. And then you can get, you know, you grow into your bigger your bigger legacy manufacturers.

Tanya 28:30

Okay. Okay. Yeah, that’s, that’s clear. That’s clear. Okay, then what about circular economy? Is this like a topic that’s kind of talked about in the US?

Interviewee E 28:30

Yeah, I think so. I think more and more we see it in a couple of places. I see it being talked about in the South a lot (?), so like garment and apparel and textile. I see it in being talked about in like construction a lot. And both in terms of like, deconstructing places and then reselling, or remaking things out of the parts that have been deconstructed. I wouldn’t say it’s like a mainstream topic here. I think it’s definitely like gaining attraction. And there’s a couple of people in our, in our network, who I would be happy to introduce you to who are doing that work. But it’s actually not something that you may have had a lot of space to focus on, like the sustainability and environmental side of manufacturing. Where we have seen it is in those two sectors that I described.

Tanya 28:30

Why do you think it’s not really a focus for UMA?

Interviewee E 28:30

For us, oh, straight up capacity. We’re a team of three people. So we just don’t have Okay, we don’t have a lot of time to do everything we want to do. I mean, we it’s something we we’ve been wanting to do, but we just don’t have the capacity.

Tanya 28:30

Okay, okay. Well, why prioritize the economic development over the sustainability stuff?

Interviewee E 28:30

Yeah, that’s a great question. In a perfect world. I think they really do go hand in hand and we see that and we see the way that you know, so much of economic development really puts a lot of different communities at a disadvantage. And they also always face an environmental disadvantage too. So how can we what role could we play is something we do want to explore, I think. I think we really focus on economic development because we see manufacturing as a wealth building strategy for communities. And so we really want to support the efforts like broadly of what they’re doing. So a lot of our a lot of our members, you know, are thinking about sustainability, and maybe the circular economy is like a subset Or another way to describe that.

Tanya 28:30

Okay, okay. Yeah, I mean, it is it is. It is obvious why economics to me, I think it’s much more if you’re advocating for makers who want to commercialize ... want to make a living … entrepreneurs … I think they would probably … their first priority would be economic development, and then it would be sustainability side. I can, I can definitely see that.

Interviewee E 28:30

Yeah, I mean, it’s a it’s like...... I wish it didn’t have to be I wish we didn’t have that like......... sorry (referring to the interference of her cat)

Tanya 28:30

Hello...

Interviewee E 28:30

Like lurking in the background.

Interviewee E 28:30

I wish we didn’t have that like either or, and a lot of companies don’t, you know, there’s like more movement towards the triple bottom line and making sure that we have a societal, economic, and environmental bottom line with the companies. And I think I think more and more, you know, manufacturing is moving there. I think like one thing about urban manufacturers is they do have less waste, they do take up less space, they are more environmentally conscious of the impact of their what they make on the environment. And so I think there’s like a flow or shift for the newer companies that sort of just take that and maybe it’s a generational thing too, but they just sort of like weave that into their ethos and weave that into their their products. You know, there’s the One for One campaigns or “we’ll give us percentage back to the oceans” or you know, whatever that is. And that’s like part of it, but I even mean in their, like production capacity and like why they exist.

Tanya 28:30

Mm hmm. Do you also see that kind of in the support organizations that you support?

Interviewee E 28:30

Yes and no. Again, I don’t think it’s like, for some of our members, it is an explicit focus. Like there’s this woman out of Los Angeles. Her name is Gina Lee. And she is really focused on the circular economy in the garment initiative and in the garment sector. So she’s thinking about how to make it more efficient, how to make it less harmful on the environment, efficient in terms of like materials and less waste and then connecting all the different users. Oh, that just reminded me of a group that I just talked to that was keeping Sorry, I’ve had so many conversations in the past three weeks with all this COVID stuff that I’m like, blanking on who this is, but I’ll try to think of it. So, um, but yeah, like a lot of the focus of our practitioners, our members is just around economic development, and sometimes that can include environment and sometimes it doesn’t.

Tanya 28:30

Yeah, that makes sense......by the way with the COVID. How has this affected the maker community or the urban manufacturing community?

Interviewee E 28:30

Yeah, definitely. I mean, you know, a lot of them are like, focused on a lot of them are essential businesses. So food production, some construction, some garment with PPE, some, you know, medical devices, but overall, yeah, like it’s gonna have a really, really deep impact on our communities and our manufacturers, just because a lot of them were operating it, you know, low low, but I mean, all manufacturers, you know, they have really tight margins. workforce is a huge component of their of their pay and if they’re, you know expenses so, like supply chains are kind of getting reconfigured and we’re trying to like, and you know, businesses are just trying to figure out how they’re going to survive the shelter in place. And then there’s, then they’re going to have to figure out how they’re going to like restart and rebuild from like, a totally in a totally different paradigm than work. We’re used to.

Tanya 28:30

Yeah, yeah, cuz I’m asking because there’s kind of I feel like the virus kind of shined a light on how the supply chain shouldn’t be too globalized. And like, all the masks shouldn’t be just produced in one country. You know, I read on. Yeah, like I read on Bloomberg, I think two days ago that Japan is funding its own companies to shift production back from China back to Japan. So there’s kind of this idea, like, maybe it’s not such a good idea to maybe we should produce things locally, like, do you think there’s a similar idea in the US?

Interviewee E 28:30

Yeah, I think there’s some legislation that we’ll see in the next couple weeks, where, particularly around PPE and medical and I think pharmaceuticals too you know, we can see more action of bringing reshoring and I think if we can, like, use this moment as a transformation for that, I mean, we’re gonna have to like wrestle supply chains away from where they are now, because it’s so entrenched, and there’s so much money tied up in it. And there’s so much knowledge also, like companies who are making these products know how to make them yeah, and so We’re gonna have to like, learn fast. And you know, we have the technology in the smart people to do that, but in every country, but like it’s gonna take some some effort and some coordination and work, which, which is always hard. But yeah, I think I think we’ll see some some movement, you know, towards bringing more of that back to not just the United States, but to like specific countries and regions.

Tanya 28:30

Yeah, yeah. I also have like, yeah, I have a lot of questions of how that would work. And, and since I started this topic I am not familiar with urban manufacturing. I’m more familiar with circular economy. So urban manufacturing is a new thing to me. And at first, it sounded very cool and fun. But then the more I think about it, the more kind of questions and doubts that I have. So I would, I would, I would be curious to see what you think. But we’ll talk about that later.

Interviewee E 28:30

Yeah, and I should say, I probably have like 15 more minutes, I have to make a quick call to one of my board members. So, okay, I’m sorry to cut it short, but we’re just trying to deal with like a bunch of

Tanya 28:30

Yeah, I can imagine. Okay. Okay. Good to know Okay. Then we’ll focus on the drivers and the barriers which we kind of already mentioned. Yeah, um, I guess, um, what we haven’t really talked about was the municipalities. So, do you also call the municipalities like the city government? Okay. So what are what are the motivations of municipalities for for introducing manufacturing, or are they not actually interested?

Interviewee E 28:30

I think it really depends. I mean, like New York City has a whole section of their economic development corporation that’s dedicated to retaining industrial I mean, the reason cities care about industrial is they pay really good, a lot of them pay really good wages still. And so they are really good ways to employ. Particularly I mean, this is lessening and becoming more complex, but particularly people with lower levels of education. And so there’s still this like, really strong economic argument to keep manufacturing in cities to help people access those jobs.

Interviewee E 28:30

And so they spend a lot of their time not only sort of helping those businesses connect to resources, but also like protecting the land that they’re on. So in big cities, kind of looks different in different sizes of cities, but in hot market cities, like their industrial is feeling tons of pressure to convert industrial land to housing, especially, or other commercial uses, like hospitality. And so they’re the advocates in those cities, you know, are fighting to retain that land so that those those jobs can stay there. That’s like the economic development jobs, right. So and then like smaller, colder market cities, it’s about It’s about in turn, it’s, it’s helping those, it’s providing spaces and places this goes for for both hot and cold markets. And its really providing spaces for those makers to start and scale up in particular. So a lot of people were thinking about, okay, you know, maybe a company starts in their home, then they need to scale to a makerspace, then they need to scale out if they really want to make an economic impact, like you got to have that continuum of services to help them grow into someone into an entity that’s going to employ other people, if that makes sense.

Tanya 28:30

But isn’t it that if they scale up too much, then they’d move out of the city?

Interviewee E 28:30

I think it really depends. I think that I mean, if you are a company that’s going to grow to a couple hundred people Maybe but like if that could be true in in some cities like New York or San Francisco, but if you look at cities like Chicago or Buffalo, New York, or Detroit or Milwaukee, like these older industrial cities, they still have that kind of, they have those, the building stock. The problem is the buildings are mostly dilapidated. And so a lot of people are thinking, Okay, how do we like retool those buildings? Or how do we build new buildings on that ground like the I think there’s opportunities to keep bigger manufacturing in cities, but it takes a lot of effort.

Interviewee E 28:30

And so a lot of the times the buildings in the suburbs do look really great, because maybe they’re a little bit newer. They’re built in the 80s or 90s. And so they’re, they’re more “move-in” ready, but then you’re taking yourself away from your workforce. And you’re asking your workers to have to commute out to the suburbs, especially if they live in the city. And so then you’re like introducing a different problem. You know, how do you how do you get public transaction those suburbs? How do you do? How do you You saw like the last mile, like maybe they can get to a mile away or two miles away, but then they don’t have a car or they don’t want to walk in the winter. Like, what is that for in the summer? What did that what does that mean? So it’s like a balance. And I would say that, on the whole the makers who are starting a lot of them I don’t know, if they envision themselves being 100 plus person company, maybe they want 20 employees or 40 employees. You know, I don’t think not everyone wants to scale. I’d say most people don’t want to scale to that that size.

Tanya 28:30

So I guess the vision would be instead of having a handful of manufacturing companies with 100 employees, it’s a lot of smaller manufacturing companies with, let’s say, 20 employees. Is that the kind of division?

Interviewee E 28:30

Yeah, I think so. And you can you can see how that would be more attractive to a community in the long term, versus what we saw in the 70s and 80s. When these massive companies left and left thousands of people unemployed. So if you have, say, 100 companies with 10 people each, if two of those fail, or 10 of those fail, that’s such a smaller proportion than if one big company leaves the community. And so, yeah, that’s, that’s what we think about a lot is like, how do you distribute that kind of economic development across a lot of different companies. And you know, with technology and automation, you just don’t need though, that that number of people, a lot of times to the jobs have changed so much since those large manufacturers left or failed. So not only do you have like different space needs, you also have different people needs and then the qualifications of those people are different.

Tanya 28:30

I guess that’s where it complicates the whole jobs for people with lower education. That’s what comes in.

Interviewee E 28:30

Yeah. So we have a lot of people who are thinking about training Like connecting with those communities, those lower income and underserved and undervalued communities, how do you provide the services they, they need, like child care, transportation, remedial advancement courses, and then also on top of the manufacturing skills that they need in order to still get those jobs that used to be easier to get just with a high school diploma or walking in off the street.

Tanya 28:30

Yeah, yeah. Cuz I......yeah, I was kind of a fan of one of your presidential candidates, Andrew Yang. He got knocked off like a while ago, but yeah, so that I was very interested in that. Wait, how much more time do you have?

Interviewee E 28:30

About 10 minutes. If you want to, like send me questions, I can try to type some quick answers out to you too if we don’t cover something you need.

Tanya 28:30

Yeah, yeah, maybe I might do that. Um, what about For, for you guys, for you and me....., um, kind of what how did it? What drove it to start in the first place? And then what are the kind of barriers that you guys faced?

Interviewee E 28:30

So we were founded by two local branding organizations SF Made and Made in NYC. They, they found each other somehow back in like 2010 2011. And they realized that they were doing the same kind of work across the country, but they were feeling really isolated. And they didn’t have anyone to like, share best practices with and understand how they were going to implement their programs or connect to manufacturers or help grow the ecosystem. And so they came together in 2011, and actually became a Clinton Global Initiative to connect practitioners between 12 cities, and so then they got funding You know, for a couple of different foundations and corporations to try to do that. And now we’re 900 members across 200 cities. And so basically the impetus was like to grow to create a space where people could connect about how to keep manufacturing in cities. And that’s really why we exist today, essentially.

Tanya 28:30

Okay, I would say the last question to wrap up would be kind of in an ideal......Okay....two questions very quickly. One question, what kind of manufacturing do you see in the cities that what kind of manufacturing is suitable for doing in cities and what is not?

Interviewee E 28:30

I mean, I think things that are suitable are things that can happen in small spaces. So you see a lot of like the maker sort of artists and all stuff around You know, leisure goods, Home Goods kind of thing for consumers. I think you also see a lot of Sorry, my cat just bit me a lot. A lot of Ah, he’s really hungry. You see a lot of like technology and design driven works. So you see a lot of like biomedical. You see a lot of additive manufacturing. So with 3d printing, you still see a lot of like machining and tooling, smaller shops. It really is like agnostic food production is really big garment production on small scale. It’s just the scale is so different. So they’re not turning out, you know, massive automobiles, but they might be turning out, you know, pieces that go into cars. So that gets sent to somewhere else. So that was your question, right? What kind of manufacturing do we see? Yeah, so I would say it’s really like designed a lot of its design forward design oriented, a smaller scale, taking up a smaller part.

Tanya 30:06

Okay. Okay, last question would be kind of how do you see? So there’s this, you know, legacy manufacturing these large scale, huge, you know, factories in China or in the suburbs? How do you see this new SME or makers? Do they completely replace these traditional legacy manufacturing? Or? Or do they not? Do they kind of fill the gaps and what kind of role? Do you see that they have?

Interviewee E 30:37

Yeah, I mean, I hope they don’t, I hope they don’t replace the big legacy manufacturers. As long as those legacy manufacturers are being responsible and good and players and everything. I do see them as filling a gap. I think that they’re much more dynamic. They’re much more like I was saying design driven and I see an opportunity we see an opportunity for them to really inform the way that the legacy manufacturers do their business. So we run an event called the design jam, where we connect industrial designers, to larger makers to larger manufacturers. And we have them do like a design thinking sprint, where they like, create new products using the processes and materials of that legacy manufacturer. So we show them like, what it could look like to have an industrial designer on staff to rethink the way that they’re doing. And that would make them more competitive, more sustainable as a company.

Interviewee E 31:34

And so we really see them like I was saying, like, it’s part of a continuum, like the legacy manufacturers often they paved the way for the smaller manufacturers. They’re still doing the work that they need out there. They really like paved the way in a lot of ways like infrastructure workforce training, the fact that manufacturing still existence and uses thanks to these manufacturers, these large mature legacy manufacturers, but they’re also a lot of times very entrenched in one way of doing their business.

Interviewee E 32:13

And so I think they can be and this is a moment this, like COVID moment could be that transformational moment where we’re saying like, okay, you existed for so long in one way, how are you going to survive this? It’s going to be through thinking about new ways of doing business and new ways of operating. Whereas those smaller makers and SMEs, that’s what they’ve been doing from the start. They’re trying to survive. So they’re always thinking about ways that they can do things differently or create newer products or adjust the way that they that they produce just so they can survive. So I think the legacy manufacturers, I think they really stand to benefit from one another. If they can figure out ways to work together, which is something that is really hard remade. Maybe it’s generational issues, maybe it’s technological issues. That’s something that we try to think a lot about and how we can sort of build those bridges between the two communities.

Tanya 33:06

Okay.......And are there? Okay, I think that should be the end, right? Because you need to feed your cat. And you have you know, I just think what what what?......How did the legacy manufacturers think of that, as was, for example, that thing you said? Was it the initiative of the legacy manufacturers?

Interviewee E 33:26

No, it was a it was created by a designer firm out of Chicago a couple of years ago, and they kind of are bequeathed to us there. We’re using it together. Now. I wouldn’t say it’s an idea of the legacy manufacturers and I think some are super open to it and some couldn’t care less. Yeah. Some will, some won’t. So what like that old saying, like we have to, you have to find the ones who who do want to be dynamic and figure out new ways of doing it or you need to incentivize those other companies to do it.

Interviewee E 34:03

Like we’ve been thinking a lot like, how do you...if you partner with like the Department of Defense or something, to say like, Hey, you need to you produce this one product for, like the defense or supply chain or something, if you go under, that supply chain is going to be very impacted. So what else could you make in your other time that would like sustain your company so that when we do need you to produce x product, you’re still around to do it. So it can be sort of a sustainability, not in the environmental, but like an economic sustainability argument to that you need to be able to have a diverse products, not a new concept, but it’s kind of hard to convince some people sometimes.

Tanya 34:46

Yeah. Okay, I think that’s clear. Thanks a lot for your time. I might email....

Interviewee E 34:50

I’m so sorry to cut it short. We’re just running. I’m running around like crazy. If you have questions you want me to answer, send them over and I will also send you the reporting.... and I’m happy to make introductions to other people. I can maybe give you some links to their websites and then you can say like, Oh, that was interesting. That one’s not that kind of thing.

Tanya 35:12

Okay, that sounds really good.

Interviewee E 35:15

Okay, yeah, that would be helpful.

Tanya 35:17

Okay, cool.

Interviewee E 35:18

I am Writing down some ideas, and I’m gonna have to think about that one that I couldn’t think of … Hmm … It’ll come to me.

Tanya 35:27

Okay. Well, thanks for your time.

Interviewee E 35:29

Yeah, tell me your research. Sounds awesome. I really want to read like your work when it’s available. Sol

Tanya 35:35

yeah, I will, I will, I’ll transcribe the interview as well and send it to you to see if you have you find any errors.

Interviewee E 35:44

I’m sure there will be.

Tanya 35:46

Okay. Well, I’ll see you then. Thanks a lot. Bye bye.

Transcribed by https://otter.ai

Interview F

Tue, 4/21 11:29AM • 1:13:53

**SUMMARY KEYWORDS**

Businesses, city, waste, called, municipality, Brussels, instance, organizations, problem, land, materials, project, space, nace, activities, terms, building, money, interesting, electronics

**SPEAKERS**

Tanya, Tanya Tsui, Interviewee F

**Tanya** 00:01

Okay, it’s recording.

**Interviewee F** 00:52

I come from much more of an organizational perspective, the perspective of the business and I don’t come from the The perspective of the of the, of the planning regime as much. That’s just my, that’s just the way I approach things from from the users perspective. So, so, for me, slightly different, but um, the with the MISTA Project, it’s been have really wanted to work out how to connect NASS codes and a C code that, you know, I mentioned, you know, the statistical system. You know, talking about this type? no okay. Okay, so, as soon as you start to scrape your way into this, you’ll you’ll start to see how certain kinds of objectives end up, forcing people to take certain kinds of approaches. And one of those is data and data is linked to systems of evaluation. One of those is the NASS codes, and then NA so that’s the NA. NACE it’s a French acronym nama collateral....

**Interviewee F** 01:24

So definitions of the city’s the so I’m involved in another project called “MISTA” This is the Metropolitan industrial.... can’t remember... uh

**Tanya Tsui** 01:24

I Think I read about it somewhere? Maybe I was, yeah,

**Interviewee F** 01:24

it’s a spawn project. And so they’re really concerned with these definitions such as such as the city because they they need to because they really need to evaluate using data compare and whatever have you. So, so in their context, which is different from mine because I think I come from much more of a social perspective, I dare say, much more.

**Interviewee F** 02:06

Anyway, it’s essentially the European nomenclature system. And so and so that has these five levels, and then called NACE levels. And the first one is the is the member states, the large largest level. The second one is, is it’s roughly the region’s. So I think in your case, like Brabant will be a region, you’d have, Say zeeland is a region, South Holland is a region. So it’s quite large. NACE Three then goes down into a much smaller region level, and I think that’s more of a municipal level. Anyway, until until NACE Four which is very, very fine data. And that’s it. Where there’s almost no data for so So up until NACE Two is a fair bit of data.

**Interviewee F** 02:07

And so, when you go under that, and that NACE Three, then it starts to get problematic. But of course,that’s going to kill...and as soon as you get under NACE three then then the accounting systems become relatively inconsistent from one place to another. There’s there’s issues with, with how things are evaluated and so on. So so that’s if we’re talking about accountability and getting and trying to be quantitative with with with what we refer to as the the metropolitan area or the city. I we can have our discussions about what the difference is...Then Then that’s, that’s, that’s the trap that you’ll end up falling into, which is basically not necessary. About ideologies about what the city is, but you’ll end up getting trapped by data. You have, you have, of course, another perspective, which is much more in terms of the urban planning perspective, and you’ll start talking about distances to work and an interesting one is distances to the airport, for instance, which for a lot of businesses can be really important instead of distances from the sea the distances from the airport or major train station is just an indicator.

**Interviewee F** 03:06

And then then, of course, you’ve got you’ve got political boundaries, which will be which was a totally different perspective. As I said, me personally, I, I’m fairly...how do we put it... I have my concerns about data, so that already throws me out of getting stuck into the, into the, into the nomenclature system. I, I also see that businesses relate in very different kinds of ways. So for some businesses, their networks are extremely localized. In other words, you know, you’re talking about scale of a country or the scale or the value chains can be global. And so it’s very hard to, to essentially get stuck into into that kind of into a into a into a certain kind of network which is based on an ecosystem. The way I prefer to approach it is by saying what what is the kind of what are the kind of activities which the city needs and what are the kind of businesses which need the city to survive. So if you think about it from that perspective, then then distance becomes a little less important, but Again, you’re going to be facing, you’re going to be running against problems with with distance time, for instance, commuting times.

**Interviewee F** 03:26

You’re going to be talking about, you’re going to be talking about relationships between one business and another. So the big business ecosystems...Yeah, so it’s not a, you’re gonna be talking about education and training as well. You’ll be talking about tax and financial systems. There. It’s not a perfect measure, of course. So the point is,... don’t get stuck on this point, because it’s irrelevant, because you’ll end up trying to, you know, one way or another, sacrifice certain perspectives in order to keep a kind of mindset. I don’t believe in that. I just simply think you have these places and around these places certain things happen. Some are very, very highly connected. Others are less connected. and stuffs are

**Interviewee F** 06:12

Yeah, of course you have critical masses. So for instance, in Brussels where you have a certain kind of population, a million or so people, million and a half if you count the area around them, we’re talking about 3 million is gonna have a very different kind of, it’s gonna function in a very different ways. Say, say a city. Like, I’ll take Liege, which is just 100 kilometers that way, where it’s a city of 300,000 or there abouts and you don’t have the critical mass that you do for Brussels because we’re relatively connected you know, like we’re a train ride to Leuven and half an hour so you might as well consider Leuven as part of Brussells with a train ride to Mechalin, which is half an hour. So you know like these kind of things where where you can you can expect certain kinds of niches and certain kinds of activities can be found here in Brussels, which you can be couldn’t afford to do somewhere else because you just don’t have the density of businesses.

**Tanya** 08:09

Hmm. Okay....What about the circular economy? How I’m guessing it’s more focused on materials and also on the R’s? Like reuse, recycle remanufacturing, etc. and less on water and energy is that would that be kind of what the focus was

**Tanya** 09:06

You know, we, we didn’t really dig into that. But I would say the moment we do have skip because I didn’t show you them....I think you might have seen them. So we have, you’ve probably seen the book, we have all these. And each pattern has these kind of these cards. The Black is the technology and....technology and resources.

**Interviewee F** 09:50

And there’s one which is here, which is called and to reuse materials and energy flows. So Yeah, it’s not like we disregard. But it’s just more of you know, we see, we see that more in terms of industrial symbiosis. And and I wouldn’t say that the core focus is on producing enough energy to supply a city it says more about, you know, you’ve got a roof so you might as well use it because you can save money because it’s better for the environment. Because isn’t that.

**Interviewee F** 10:32

we have another card somewhere else here, which is code productive rooftops for instance?

**Tanya** 10:38

So I think we have a good foundation of the two topics. I’d like to discuss how urban manufacturing contributes to the circular economy. So I have kind of, I’ve been like talking to different experts and reading stuff on it, and I have to Some questions. For example, what what is kind of the impact of urban manufacturers? Because they’re usually at a smaller scale. So they can’t take advantage of economies of scale. And they can, maybe they’re less efficient, or? Yeah. So that would be my first kind of doubt.

**Tanya** 11:32

And then the second one would be like, to what extent are many urban manufacturers actually circular? So they might fabricate in the city, but they source their materials from all around the world. And also, they might not sell locally, they might also have a global customer base. So that’s kind of my questions. And if they and also if they scale up, you know, Like they can, this that’s this is like the misconception maybe or the common assumption is you know, if if they need to be located in the city, they need to be compact. And that means they need to be small scale and then if they scale up there but they leave the city and so they lose the benefit of being in the city, but you get the benefit of being large scale. So, so I have questions about that and specifically like your your own experiences talking to to the companies.

**Interviewee F** 12:30

Okay, so sort of quick set of points on whether the business is a circular or contributing to or, or impacting on circularity. I would say on the whole while there are some really interesting examples of businesses which are doing some some nice things like you mentioned by being a second ago You’ve got rotor you’ve got a few others.

**Tanya** 13:03

Yeah, the rooftop farm yeah I know rotor Okay, were my teacher actually when I was at TU Delft.

**Interviewee F** 13:12

okay they’re really interesting example, I’ll try to give you the context: So you’ve got rotor you got to CF2D, you got bio-bean three three examples which I think can illustrate and you went another one which is which which is called which is called...the tap maker which is down the road in Brussels. So on the whole research from from London found, actually, surprisingly, that industrial waste is a huge amount of waste. And it’s relatively pure in the sense that it can be can be sorted relatively easily. And it’s relatively consistent because if you have a business which is, say producing plastic golf carts, it’s relatively easy for them simply just to throw their certain types of off cuts into different bins. And then from there, then you can easily

**Interviewee F** 14:36

But it’s not happening right now. It’s not happening for a few reasons. A particular particularly important reason is that a lot of industrial waste management is outsourced to private. So while you have public waste management for domestic waste, Were these these institutions which are managing the waste for domestic waste have also sort of an accountability chart public or social accountability. objectives to make so so one of those might be environmental, which is waste management, which is sorting and what have you.

**Interviewee F** 15:26

A lot of these businesses have don’t do that. And they simply look at what makes most financial sense. And so, so, because of the, the, because of the conflicting objectives from say, for instance, written what they call renewable energy, one, one way that business might make money is simply to send all that waste directly to an incinerator. So everything is just burnt in one go instead of sorting it and then trying to find value chain, which in fact might cost a lot more effort and probably means that you don’t get as much money back. So there’s so even though there is a, there are ways for there’s a lot of capacity for the industrial sector manufacturers to be a lot more effective with their waste streams. And in many cases, it’s, it’s not taken advantage of properly. So that’s a that’s a real opportunity I would say.

**Interviewee F** 16:36

On the flip side, you do have organizations such as such as, such CF2D, Rotor, Bio-Bean, which are interesting examples of what you might call these niche organizations which are popping up which you’re trying to deal with, with waste of some kind. Now, is that going to work? Is that going to capture all possible waste streams? And therefore and create circularity? The answer is absolutely no. Like rotor for instance is or is a prime example of an organization that essentially cherry picks what the high value materials and, and essentially make money out of that because you’ve got hipsters like us who, who like to have nice lights, which come from somewhere or, or in fact, kitchen handles from our kitchen all come from Rotor. So you know, they’re the kind of things which, which Rotor are going to are going to deal with.

**Interviewee F** 17:47

They’re starting to get into installation now because you know, they can make money out of that, but you know, they’re not going to systematically pull apart a building and pull out all of the bricks and what have you, to reuse all of the material, because it’s just it’s just not financially viable. And there’s a certain logic behind that. So. So bio-bean from memory is relatively similar there, of course addressing commercial coffee, if I recall properly, they’re addressing commercial coffee. And therefore you have to have businesses which which produce a certain amount of coffee cafes has to be quite easy. And you have to have the volumes, which makes sense. I could be wrong about bio-bean because I just don’t remember what the business was. But I think so. And then you’ve got another organization called Cf2D, did you see the video on today?

**Tanya** 18:58

Yeah, I saw that. I saw the film. So so I know a bit about them now.

**Tanya** 19:16

I have a question when you say that industrial companies are outsourcing their waste treatment. So risk management, waste management, but there’s so does that mean there? Is it the municipality is outsourcing the waste management to private companies? So was it a version of various okay?

**Interviewee F** 19:39

I’m not I shouldn’t I shouldn’t generalize here because I think every every location is going to have a different way of managing its its resources. But in many cases, in many cases, and I know this, I know this is the case in London and that’s the case here in Brussels. You you’ll have the waste... so the business is responsible for managing its waste, because it’s commercial business and over a certain size, it has to take care of its waste. So then it’s going to call up Suez, you know, which is a big waste operator or Veolia, you know, really as quite established in the Netherlands, I think there’s probably a couple of other bigger ones in the Netherlands that will basically take care of this waist up and you know, they’ll just basically pick it up from the businesses throw it in the big truck, take it to the waste treatment plants and from that basically then taken off to you know,

**Interviewee F** 20:37

if it’s really easy like metals, for instance, which are pretty simple, then that’s going to be taken care of, because that’s high value easy, easily. collectible stuff is taking a magnet mafia. But then, but then the you know, the plastics which kind of fiddly, like wood chips and stuff. Electronics is pretty complicated, you know, that kind of stuff. It just gets incineratorated or something. Yeah.

**Interviewee F** 21:09

Yeah. And, and in the case of CF2D, for instance, they, they’re a social economy, organization. And that’s important because they’re linking two dimensions so that they’re connected to parts of the story and citizen making project is the social social aspect with the circular. And that’s really interesting because because these are like what you would call low skilled, low value jobs. But they’re supporting a part of the part of society which would otherwise have a lot of trouble getting getting work. So there’s a certain logic in stimulated stimulating these businesses essentially subsidizing these businesses. Because they they are addressing a serious environmental issue. But they’re also addressing other problems such as skills, capacity building and stuff.

**Tanya** 22:11

Yeah, yeah. That’s actually quite interesting because the some of the organizations that we’re working on in the Pop-Machina projects are like that. So they’re municipal organizations that provide work to people who have a distance from the labor market. So I thought yeah, that’s quite cool. There’s Yeah, anyway, um, but I have...

**Interviewee F** 22:34

other things sorry. Just Just before we finish, I’m sorry for having to answer these questions properly. The there are some things that you simply just can’t trade at a metropolitan or city scale, metals, for instance. You know, in Belgium, there’s just a couple of metal treatment plants. There’s is one in Antwerp. Another one and I think there’s a third one how remember if the one is shallow was completely closed down or not. But anyway there’s there’s very few of them. And so anytime say a building is, is being totally renovated or rebuilt all that steel that comes out of that building essentially gets gets the the demolition company will end up pulling all the metal out. They take it to, in this case to the harbor in Brussels. That thing gets put onto a boat it gets taken to Antwerp or then taken to Ghent and then it’s been retreated. So yeah, there’s some things like that. Metals is a really good example, paper is another one, chemicals...

**Tanya** 23:56

So these things are things that cannot be done at the municipal city scale but at the national scale, okay what would be some products you’ve observed that can actually be recycled or whatever and within the boundaries of the city?

**Interviewee F** 24:15

you’ve got probably the least interesting but but a real low hanging fruit and that some organic waste so, and that’s pretty simple that you can this is there are dozens of ways of treating organic waste, some which are very industrial and some which are much more decentralized and can be very useful for say urban agricultural projects and can be tied into the city in a much you know, can create these these local value chains which are quite interesting. That’s, that’s a real simple one. And you’ve got Of course, anything regarding repair. Which, which is just an obvious, super obvious one we’ve got so yeah, there’s the logical bikes and cars and furniture and stuff like that which is which is just totally, totally obvious.

**Interviewee F** 25:30

And the interesting thing there is that, that with these businesses, even though you would think that they are very, very well integrated into the urban context, a lot of them simply losing their spaces because they’re being being priced out of their spaces. So So, even though you would say that that’s a very city city, focused kind of activity. It’s becoming more and more challenging. Or to have these kind of businesses close close to clients. So they end up getting pushed out of city centers and pushed out of push to the edges of the city where you no longer have a connection with your local your local neighborhood. And that’s really problematic because things which could be easily repaired or treated end up not being ends up becoming too costly to simply fix a fix something than to just throw it out.

**Interviewee F** 26:39

What else? Yeah, of course, you’ve got the whole building materials story, which probably not very well, and yeah, you’ve got so for instance, cement we’re starting to see that being recycled. There, there are some exciting businesses which are looking at, like terracotta roof tiles and a lot of insulation that can come out of buildings is still still a lot of problems around certification. So construction is of course, huge. That’s one of the biggest volumes of waste. Yeah.

**Interviewee F** 27:32

What else? Yeah, electronics i think is an interesting one. Because that’s just, that’s just, that’s just a 21st century problem. And you’re starting to see more and more businesses which are getting into into electronics and trying to do it properly; in the past electronics, basically business would just pull out gold, mercury and sort of the easily easiest stuff that they could just extract and then basically sell off and then all the rest of the parts, like the circuit boards and what have you ends up in that getting crushing. I don’t know what happens goes into a magic box. I don’t I personally don’t know enough about this. This is something that you really have to speak to Teresa Domenech, she’s from UCL colleague.

**Tanya** 28:44

Oh, she’s the MFA person, right? I saw the MFA...

**Interviewee F** 28:48

Yeah, she she’s, she knows all these kind of details like Yeah, really? Yeah. So So speaking to me I’m I can tell you more in terms of how these things relate place. Okay, I know it’s, I would say, your lead treatment of electronics. Yeah, it’s perfectly, perfectly easy to integrate that into the city.

**Interviewee F** 29:15

The only problem is, then you would have to think about some kind of subsidy system because it’s just not financially viable right now. Same goes for construction materials, and I wouldn’t say it’s a subsidy system, but it’s going to be more of a it’s going to be more of a zoning issue. And there’s to make sure that you’ve got the space for, for the, for the treatment, recycling, storage and storage is really, really important. That’s a that’s actually a that’s actually a massive challenge for a lot of cities is to have the material storage in the construction sector which is localized

**Interviewee F** 29:57

and in the past municipalities have their own dumps and tips and waste treatment, and they’ve become increasingly centralized. And that’s a massive problem because because if you have a building, which is gonna get going to get demolished, essentially, you want that building to be pulled apart, taken somewhere very nearby so that your tracks don’t end up having to go back and forth wasting time and traffic. And then the materials from there can then be reused somewhere nearby as well. You can’t do that now because we don’t have the space and then because not only not only that, but you need to have a space where you have we’re dealing with construction, which means a lot of noise, a lot of dust. So we need to have an incredible amount of space, a buffer area around a treatment, the treatment so so that’s where it becomes really problematic because businesses simply say yeah, if I’m going to be stuck in traffic for an hour or two to get from the construction site to the Depo where I can dump the materials. It’s just simply not worth it, so why bother?

**Tanya** 31:11

Um, you also mentioned that Okay, so all of these activities need kind of some kind of subsidy and that they’re not financially viable yet so what’s preventing them from being financially but they’re

**Interviewee F** 31:29

they’re not they’re not financially viable because because you have other activities which are far more well theoretically fetch a higher price I don’t want to call them valuable, but I’ve been housing commercial space...activities like that which which venture high a higher rent return, of course are going to take precedence over an activity which occupies a lot of space and employs a very small number of people and where the, you might say the turnover, profit generated from that side doesn’t have direct benefits on that site.

**Interviewee F** 32:23

So, of course, if you had, if you had material waste treatment depots all throughout the city, we would see that that would benefit the entire city. But in terms of making a profit on those individual sites, you won’t see that profit on that individual site. So therefore, in the end, what what you’re getting with When, when, when we’re talking about accounting, accounting and spreadsheets, you’re going to compare a hotel to a to waste treatment facility and of course, the hotel is going to be You know, many times more profitable than a waste treatment facility, which in the end, the wedged waste treatment facility is probably going to have to be subsidized as well, whereas the hotel is totally profitable. Which one of these two you’re going to choose? Yeah. Yeah. So so that’s the that’s the biggest problem the hotel. Yeah, it’s gonna provide jobs and profitability for that side. But in terms of the bigger, bigger, bigger city context, then, you know, if you don’t have your waste management system sorted out, then it’s going to be a problem. But it’s, it’s it’s a much it’s a much less evident problem until it’s a huge problem.

**Tanya** 33:42

Yeah, yeah. And also, it’s like all the benefits are externalized. So it’s very hard to calculate the value of a piece of land if it was used for circular activities, let’s say. Okay, clear. And also what do you think? Next. So we were listing out like the types of products that makes sense to be circular at the city scale. Like what connects all of these different things like organic waste repair furniture, building materials.

**Interviewee F** 34:16

What what links them?

**Tanya** 34:17

Yeah, like why what makes them what makes them make sense to be at the city scale?

**Interviewee F** 34:32

So the problem with that question is that it’s very ideological. If you talk to, you know, real, hardcore, real traditional real estate developer, as a, as a very capitalistic kind of mentality, they’re going to say Yeah, it’s really just gonna compare two different land uses. This one makes a lot of money, this one doesn’t make any money. What are we going to do? We’re going to say we want more of this one, not that one. Yeah, you know, so So, so why have this this this activity which, like the bottom at the end of the day makes less money, even though this one might be more important than this one.

**Interviewee F** 35:26

So so that that’s that’s a whereas if you speak to someone that has much more systemic perspective, they will see that that making sure that you have a balance and activities, some which you’re going to raise profit on some which are going to cost you money, but you balance things out because you realize that in times of crises, this is the one that’s going to save you Not this one then And then you realize that there is a cost which you pay is less profit, your your your city is maybe less attractive for investment. However, in times of crisis, you’re going to be in a better situation than in a city, which is just focused on making money.

**Interviewee F** 36:18

And we see that we see that, of course now, with this particular crisis, that’s exactly what we’re talking about this way you see that, that there are there are a lot of cities which which, which are missing their capacities to, to, to deal with, to adapt or to to find materials, for instance, safe to say, say, protective clothing, the masks and goodness what else cities like like, like London and New York that have kicked kicked out Little bit of manufacturers are now really depending on on those kind of skills to be able to produce these, these materials and gear. And so they’re, you know, it’s, it’s now Fab Labs essentially producing these these models, the doctors, you know, say, you know, and they’ve got a limited capacity to produce. And this is just, this is just a pandemic, which, you know, is one thing, but if we’re talking about an economic crisis, which would be much more, much more complex, then, you know, like, it could be, could be worthwhile having an activity that you fall back on.

**Interviewee F** 37:48

So that you you have those kind of, you can deal with, with your with waste, which you’ve also got the knowledge, the technical capacity to deal with, with, with this kind of stuff. So, yeah, I think it really comes down to mindset, ideology.

**Interviewee F** 38:14

I, as I said, like I can, I can tell you what I think. But this is what I think and and in any conversation, you’re going to end up having a range of different perspectives, all of which are completely correct like the, like the the capitalist which is saying, you know, I gotta we gotta be more self sufficient and make more money and be profitable I’m going to as well correct but the other perspective in terms of resilience and self sufficiency, different types of self sufficiency is also very correct. So, you know, we have to work out how we how we balance these three perspectives or the various other perspectives as well.

**Tanya** 39:00

And how how do your municipalities see the issue, with Brussels or London or Rotterdam?

**Interviewee F** 39:11

On the whole, I would say that municipalities have that they often have an emotional opinion. But then in reality, they’re in a much different situation and you end up having to be they end up being very reactive, taking care of, you know, core problems such as waste and crime and, and that’s, that’s the limit of their scope because they just simply don’t have the means or the or the capacity to to go to be more strategic and to invest to make those those really big capital investments that need to happen.

**Interviewee F** 39:55

So and of course, this is going to be this is going to differ from one place to another like a city like Rotterdam, for instance is going to have a very different kind of they are going to have very different capital flexibility, they probably can be asked to lend money compared to a municipality like the one where you’re where you’re living right now, which is, which is gonna have much limited capacity to make these big capital investments.

**Interviewee F** 40:27

So, and then the other thing is depends very much on on the taxation system on how independent municipalities are from from regional or the the highest level of national government. Because in some cases, the only way that they can actually get get liquidity is either through taxation like taxing taxing taxing resonance a coupon that can be property tax can also be on wages depends on the system. But it could also be on development. So in the end, a municipality has to end up permitting.

**Interviewee F** 41:20

So this is what they call development lead property, read property lead real estate, you’ll see that in the in the book in chapter two, or three. And this term property property materials, they’re probably driven real estate. And, and this is where you have to use like you rezone a piece of land. And which say, for instance, was formerly industrial, which is which is relatively low value. And then you use that to leverage extra. So for instance, The real estate developer might say, Okay, I’ll I’ll I’ll develop this is from a factory, which you know, it’s been empty for decades. No one wants it. So you know, we need more housing, I’ll give you more housing. Any municipality says, great, we need more housing. Great. But I’m also going to tax you for that, because you’re changing the because we’re going to have to change the zoning plan from industrial, which is worth four times less housing. And that picture of value, we’re going to then translate into a cost that you have to invest into the public space or into building your school or something like that.

**Interviewee F** 42:41

So So the real estate developer wins because they’re paying very little for a piece of land, which they can relatively quickly make much more expensive by changing the zone and the city or the other public authority, then tries to capitalize on that. By then using the assets or the or the liquidity that comes out of that, that project to then invested in something else, which is a common good. Yeah, makes sense. Yeah. Yeah. So it’s only through through that change, which is, which is where municipalities can get a little bit of flexibility, a little bit of extra cash, where they can develop the town square or building your school or be able to crash or whatever.

**Interviewee F** 43:27

And that’s the problem because the only way that that works is where you have space. You have real estate, where you can you can constantly the rezoning or where the municipality is an owner, and they resent themselves and they sell it off to a developer who then who them you know, so so as soon as you run out of these these really useful pieces of land which could be used for treatment or for, you know, this stuff that really requires a lot of, which is really space intensive. And then once once you you, you’ve exhausted all of those available spaces, then cities have just got no more space to play with. So right now a lot of cities are taking advantage of the fact that they had industry in the past, and that we’ve got an increased population, because then we can essentially use this this what they would refer to as as land with with low potential to essentially increase the potential. But it’s just creating it’s forcing public authorities to enter into a corner because then they’ve got less and less leverage.

**Tanya** 44:47

Yeah, yeah. And they already don’t. That’s really interesting. I’m kind of digesting but but I have kind of heard a little bit about this as well.

**Interviewee F** 45:07

So yeah, as I said, Just going back to that point, it’s a mindset thing. So, you know, I personally, as I said, You know, I can have my opinion, but the opinion doesn’t matter if that doesn’t correspond with, with the, with what’s happening on a policy level with which is if and what’s happening in terms of the business systems.

**Tanya** 45:32

Yeah, well, I see that our meeting is almost ending but are you okay with like, another 15 minutes?

**Interviewee F** 45:43

just need to get my charger. Okay. Sure. Sure, sure.

**Tanya** 46:07

I’m just looking through all the all the questions to see if I’ve missed anything because I feel like we’ve covered. We’ve covered most of what I wanted to talk about.

**Interviewee F** 46:17

So as I said, with with the material story, just gonna speak to Teresa, she’s not an urban planner. That’s the that’s the downside. But she’s she, um, she’s very capable of connecting anything issues or flows in space. A lot of engineers struggle with.

**Tanya** 46:44

Yeah, yeah. Actually, now that I look at it, it’s pretty much I’ve asked everything I needed to ask. Well, you know, the companies that managed to survive in such a, let’s say harsh environment like how, how did they survive? What what made them survive?

**Interviewee F** 47:12

So I would say, yeah, have the three types of companies you have the survivors. They’re what you would call the legacy companies, those that just been around for a long time and they’ve adapted, they’ve evolved but they’ve got they’ve got real estate assets or they’re sitting on zoned land. So they have an zoned land which is relatively safe and therefore they probably end up having a business which is on the high tech or related to the foundational economy in terms of like, could be a bakery or, or. Yeah, something where it makes a lot of sense to have your your workers located within the city. Yeah, yeah. So yeah, why not?

**Interviewee F** 48:22

You then have you then have the second group, which is the new the new businesses. And in that group then you have what are called the high tech startups. Hmm. And they, of course, as it sounds, you know, their businesses which probably have come out of the services world, it might have come out of marketing, they might have come out of engineering. But they are often organizations. They’re wanting be developing a product which is which is related to a service.

**Interviewee F** 49:09

Say for instance is no, there’s a company here in Brussels, which, which has developed a meter for protesting water leaks. You know, so there’s a certain logic which which is, yeah, a real urban problem. Of course wasting water requires high tech skills in terms of understanding how to code and then the industrial design and what have you. And, of course, you need to make this this this tool. So yeah, you find a way you find a space you work out how to do it, it’s a bit of a risk, but anyway, so that kind of prototyping probably happens in the city and eventually until you get to a point where, where you need to outsource the Production then then you just do a couple of small runs locally and then once it gets to a certain point, then you’ll, you’ll that sort of sit somewhere else.

**Interviewee F** 50:09

Yeah, yeah. And then then you have these, these, the resource management groups, which are coming out of which seemed to have much more of a sort of a circular economy. social economy kind of kind of perspective seems to these kind of fits into that into that picture, you know, these organizations which are taking advantage of, or they’re positioning themselves at the intersection of various kinds of problems and end up needing to do things. Now. They’re addressing people to do things with their hands that might be about food waste. It might be about electronics and might be about remote work. That is, of course they’ll be surviving off of subsidies or or innovation budgets or God knows what. Yeah, yeah. Yeah. That’s it. That’s that’s my that’s my opinion.

**Tanya** 51:24

Yeah. And what what kind of support are these businesses getting? So the resource managers getting support from the municipality and I guess the EU to survive?

**Interviewee F** 51:40

Yeah. So without it, they die. Yeah. Yeah. So you have you have you have a range of as I said, this, this comes back to ideology and and the ideology of a certain place in Brussels. Fortunately, we do have strong we’ve traditionally had a strong left wing government that believes in environmental sustainability and stuff like that. And so they’ve really put that high on the agenda. And also, there’s a high level unemployment in Brussels, surprisingly. And so the two of these two themes have often been combined in terms of solidarity, for social solidarity and environmental solidarity. used these terms are used quite a lot. And so you have money, you’re paying money ERDF (European Regional Development Funds) money, which is regional regional funds. Regional funds, which is co financing from you’re paying government and you’ve got, of course, the research projects. Urban innovation actions, which is also ERDF You’ve got life projects, which are often returned interesting source of financing. And then a national level or in the case of Brussels or regional level, sources. They’re not risk... They’re not necessarily very sustainable. That’s, you know, that’s a problem because you know, from one from one

**Tanya** 53:27

you move from one fund to the next.

**Interviewee F** 53:30

Yeah. And, and also, they have a political change in the political mindset and it’s been out of action. Yeah. So that’s a fairly problematic, and that’s... Look, I dare say. I think in some cases, I see the point in having long term subsidies. Some cases, like for instance, yeah, electronics, it’s just, it’s just repulsive, how I find it repulsive how we have the electronics system works right now because, you know, like, this, this the these earphones in as soon as they go out, have they stopped working, you know, it’s easier for me to throw them out the window than to go off and get them fixed. That’s just repulsive. There should be some kind of mechanism that forces me to do whatever I can to try and repair these bloody things before I throw them in the bin. Yeah. And so, to balance that, the fact that this is a consumer a consumer good and, and the mindset that we have right now is that it should be cheaper and the the repair of this thing, then we need a subsidy system which essentially allows that to to to then be also like it, like reduce the cost so that the waste of this thing isn’t is not.

**Tanya** 55:15

Yeah, yeah. I’m also interested in like the mini micro factory or mini factory, micro factory or urban abbatoirs. So these are, are they private organizations and how are they funded because they’re also kind of a, they’re like a support organization for manufacturers, right.

**Interviewee F** 55:37

So that’s, that’s where it becomes really interesting. You have two very different organizations. But that’s the two very interesting case studies. So so the micro factory is a cooperative that fits into a they have a space. I think it’s 5 or 700 square meters of workshop space. Hmm, so cooperative structure, which means that their their profit system is essentially, you know, they balanced they try to balance their budgets as much as possible. And it’s member, it’s member driven. So you know, it’s it’s done as efficiently as possible. But at the same time, these guys are paying 350 euros a square meter per month, while the commercial rate will be 10.

**Tanya** 56:36

Why?

**Interviewee F** 56:37

Because the land is owned by the regional waste agency. So that’s where that’s where the where policy is coming into play. The regional waste agency said yes, we need more more businesses which are dealing with with circular economy. Therefore we need to create a space and we need to make sure that it’s accessible to these organized So they, they, they rent out their spaces at a much lower rate. If you don’t have if you don’t have that kind of system, then the these organizations like Micro Factory simply don’t exist.

**Tanya** 57:14

Okay, okay. And there’s no waste in this agency is a national no sorry. Then it’s a regional organization like governments. Okay. Okay.

**Interviewee F** 57:24

In Brussels. Yeah. So that’s the, that’s what they call. You speak Dutch.

**Tanya** 57:30

Very little,

**Interviewee F** 57:31

a little bit. Okay. So it’s called net Brussel. Yeah, British appropriator. Hmm. So it’s clean, clean cleanliness. Okay, okay. Okay.

**Tanya** 57:42

Yeah, yeah, no. Okay.

**Interviewee F** 57:45

So, so that’s the organization which manages this particular site if it wasn’t for that, then these businesses these organizations wouldn’t survive. Yeah. The same goes for the Abbetoir. Now the Abbetoir is owned the site was formerly Paradis so the Abbetoir was built in 1910 privates land, it was purchased by the municipality of Anderlecht. So Anderlecht is one of the 19 municipalities in Brussels. Yeah. It was purchased by Anderlecht and then Anderlecht I think this is 30 years ago so basically created...how do you call this...That’s a timeshare, in Dutch you call it “herchbach”. And so basically, you you you’re selling the access for say 100 years or 50 years or something.

**Tanya** 58:53

Okay like a lease

**Interviewee F** 58:57

some kind of some Kind of lease. That’s okay. We’ve got balanced between public and private land and we have Diverse tenure models, also very important. And so here we say, provide a mix of tenure models to office space with diversity of business types in different phases of their development. When necessary, use public acquisition of manufacturing spaces to balance the real estate market.

**Interviewee F** 59:41

And then there’s three different types of Yeah, anyway, there are three particular kinds of models you’ve got. You’ve got you’ve got ownership, like Interesting, you’ve got like the lease model, which is, you know, you just basically pay monthly rent, lease. And then you have this. This, this timeshare, I can’t remember what you call it in English, where you get access to a long window like to be in Belgium, you have 10, 27, 99 year lease. Yeah.

**Interviewee F** 60:24

And so, so what the Abbetoir did was this, the the municipality of Anderlecht purchase aside and then said, okay, create a business, a company which will manage this site and essentially use it occupied for a certain period of time. And so what happened there is that the businesses which occupied the the Abbetoir, I think there’s 100 and something so businesses really small. They basically all pooled their funds invested into the into this larger holding company. And the holding company then essentially purchased the access to this. So so in the end means that these small businesses are all small shareholders of the company which manages the Abbetoir. So, so the users of the site have a vested interest that the the Abbetoir works properly. Okay. Okay, so that’s a that’s a really, really interesting business model. And, and that works but the only but if you can see there, the only way that that’s worked out is because the city has purchased the land and then has created the conditions where this would happen. And it’s not you know, it’s it’s they’ve essentially reaped the the, the competition so that it favors the local businesses and that’s what you have to do.

**Tanya** 61:53

But how did they, they said they needed a company to manage this site, but did they specifically say like, what kind If the company which and then ended up in

**Interviewee F** 62:02

Yeah, maybe in the tender process, and now they’ll very clearly specify what are the terms.

**Tanya** 62:09

Okay. And they kind of favored manufacturing or not

**Interviewee F** 62:14

It favored the local businesses. Okay, so you know, there is there is there is manufacturing on the site because so so the shareholders are the local businesses, those local businesses in some cases that deal with they are still doing the slaughter slaughtering of animals. And in other cases, they’re just businesses which selling fresh food and vegetables. But also on the roof, as you saw in the video, you’ve got the you’ve got the greenhouse. Yeah, yeah. And you have another couple of businesses like that as a business underground, which is which is in the old base. There’s a big basement area where they kept the meat they still have made and they’re making mushrooms. Hmm. So and that company is making mushrooms from the waste from a brewery which is around the corner from from the from the side.

**Tanya** 63:18

So interesting how it was really kind of how did they kind of get together like this food related stuff? Was it an organic process? Or was there someone kind of curating?

**Interviewee F** 63:30

Yeah, I think it’s partly serendipity partly opportunism, partly culture, you know, it’s just, they’re so you know, just build on it. That’s just basically how it worked out. They, they had so they had this slaughterhouse the slaughterhouse. Have you been to this site?

**Tanya** 63:49

No, no, I haven’t gone.

**Tanya** 63:50

It’s quite, it’s quite impressive. You’ll see it on the So you’ll see it on the

**Tanya** 64:06

I saw I was like,

**Interviewee F** 64:07

yeah, this is this is the slaughterhouse there. Yeah. And you say this is a city center. Okay. Okay. So you know, like it’s a big piece of land that’s the slaughterhouse.

**Tanya** 64:30

Oh, yeah, I saw that picture. Remember that? Yeah.

**Interviewee F** 64:33

And so they’re actually developing a new project. Okay, which is which is called “Manufacturr” which is which is got, which is a mix of kind of activities. Reshi (colleague?) got quite a few images of the Abbetoir as well. Okay, okay. I got I got slightly carried away with putting on photos of this bloody Abbetoir but it’s but it is a really interesting project and worth worth thinking about. Because in my opinion. My opinion, this is where this is where you have to have the public government stepping in, to purchase the side to then create the conditions where you have the private markets competitively doing interesting things. Yeah. So if you didn’t have the public, the, if you didn’t have the government stepping in at a certain point and properly investing, then you wouldn’t have these really interesting businesses.

**Tanya** 65:29

Yeah. So so the trick was that they, instead of selling the piece of land to a private developer, they chose the hundred year lease idea so that they could maintain control over the land over the long term. Yeah.

**Interviewee F** 65:46

So they could that’s Yeah, that’s really, that’s really where this as I was saying before with this property led development, that’s where the government should be stepping in instead of instead of just getting the money that the the overhead cash from from rezoning land and using that, to just build a pretty park or whatever it should be, should be taking that money and putting it into something which is really investing in jobs. God knows what

**Tanya** 66:14

Yeah, yeah. Okay. Very cool. I see we were ready going over time, but thank you for the extra 20 minutes.

**Interviewee F** 66:22

Pleasure, pleasure. Yeah. Yeah, keep keep me Keep me posted. I’m curious to see where you where you end up on this.

**Tanya** 66:29

Yeah, me too. I’ll send you I’ll transcribe the interview. It might take a while because I have a lot of interviews transcribed. So

**Interviewee F** 66:39

give me a give me an update one of these days is Tell me tell me what? What you’ve learnt. Yeah, like I’m curious. I’ll help you out as much as I can.

**Tanya** 66:48

Yeah, thanks, a lot.

**Interviewee F** 66:49

Because that because what you’re doing now is something which really yeah, I think it’s really, really important, says that, you know, someone’s got to do it somewhere.

**Tanya** 66:58

Thank you. Yeah. I’m also Yeah, really? Yeah, it keeps me up at night. I’m like, excited to like,

**Interviewee F** 67:08

come, come sometime. If you come come along to Brussels once we can all come out and play again, then come to Brussels.

**Tanya** 67:16

Yeah.

**Interviewee F** 67:19

Otherwise, I think you really should visit Theresa. Theresa is really hard to track down. She’s just she’s, I don’t know, like she’s impossible. Yeah. But if you go to London and you say I’m meeting you today, at this time, she’ll be there and then you can chew her brain. London’s not such a good example. Brussels is a really good example.

**Tanya** 67:41

Okay, okay. Yeah, I’m so curious. I’d like to talk about this longer with you. Maybe another time. Yeah. Okay, have a good day.

**Interviewee F** 67:54

When I was gonna say, I’m curious. I’m creating a map right now. Where I’m putting examples of different kinds of projects from around the place. I’ll just show you some website. I’ve hidden it somewhere. makers, makers map, and not all relevant to you, but I think there’ll be some which will be relevant to you. Throw it into the chat. Okay, so it’s on the city’s making website. Okay. I’d really be curious tonight, you know of any other projects you you, you think a relative worthwhile throwing onto this map? Oh, yeah. Because I want to try and collect them as many as possible so that we’ve got a big list of different examples from all over the place.

**Tanya** 68:51

Yeah, yeah. Okay. Okay.

**Interviewee F** 68:54

So if you have any examples, say from Canada or in the Netherlands, wherever You know, just Okay, let me know because I’m I’m doing this within the framework of this, this this MISTA project, and based on the material a producer cities are making but you know, like, I think it just would make sense if we if we try and put it all together and mass database.

**Tanya** 69:20

Yeah, cuz actually we’re doing something similar for the Pop-Machina project, but the scale is a bit smaller, but I can I can, when it’s done I can share it with you. It’s mainly looking at like almost Fab Labs Maker Movement, very small artisanal stuff. So I don’t know if it’s that relevant, but

**Interviewee F** 69:38

you sent me you send that to me one at one stage. I think what what I’d be interested to do there is is more than anything to show a few really interesting examples, the most interesting not everything. Okay, okay, just to basically say okay, so for instance, the Avatar and underlay that’s a really interesting case study.

**Tanya** 69:56

Yeah, yeah.

**Interviewee F** 69:57

We don’t want to show every single business which is located on everywhere in the city because, you know, well, but I, what I, what I would be really interested in is just finding these really exceptional examples of projects which are, you know, really inspiring when you do okay. Yeah, that’s that’s kind of storage.

**Tanya** 70:15

Is it individual manufacturers or both, like the avatar like, and also because you have groups? Yeah,

**Interviewee F** 70:24

exactly. Exactly. One. Yeah. Yeah. We’re looking at the moment I’m thinking of three things. One is like, if you’ve got an economic vision could be for an entire city or enabled. Hmm, could be a plan, like, like, like a, like a plan for her neighborhood, which hasn’t been developed yet. But there’s an idea about what is once expected. And now or the third is a project and the project could be a physical building or it could be an organization which is doing interesting things.

**Tanya** 70:57

Okay. Okay.

**Interviewee F** 70:58

Yeah. be really interesting to be able to have this list which Yeah, which you can then link to place.

**Tanya** 71:10

I mean, the the there are some cool projects in the US, like with the urban manufacturing Alliance and all these kind of branding SF made made in New York made in bread.

**Interviewee F** 71:23

Yeah, I was, I think are really interesting. They’re starting to get a bit generic, but I think some of them are really interesting in terms of how a they link to local, local, local economy as well. Not just about branding, but also stimulating. Yeah. So yeah, exactly. All that kind of stuff, which, yeah,

**Tanya** 71:45

yeah. Well, it kind of reminds me also, I don’t know if this is relevant, but like there’s this crazy building in Hong Kong where it’s like filled with electronics repair people. You can go in and, you know, turn You’re remember iPhone touch, you could turn your iPhone touch into an iPhone. No, I touch into an iPhone on like crazy stuff like that and it was based. It’s probably something to do with like the closeness to Shenzhen but like it’s always been there. And it’s this it’s called I think golden is called golden Plaza the English name. I don’t know. Let me see if I I don’t know I used to go there all the time. And I thought it was so weird. like such a cool place.

**Interviewee F** 72:29

Yeah, there’s a there’s another place exactly. Yeah, Shenzhen. I know. I love it spicy spice is excellent. This is one like this in Seoul which is called what’s it called... Saewoon, Saewoon. I was there exactly one year ago or presentation. Okay. And that’s exactly the same story well I’m starting very similar story.

**Tanya** 73:01

Yeah, yeah. I mean, I haven’t done any research on it, but I just personally went there to, you know, fix my laptop and everything.

**Interviewee F** 73:09

Yeah, exactly.

**Tanya** 73:10

It’s a crazy it’s like, probably similar in Seoul. It’s like, something like 10, 11 floors all filled with small electronics, all selling the same thing. I don’t know how they survive, but

**Interviewee F** 73:24

that’s Yeah. Yeah. Yeah. So anyway, we could have a long discussion about this.

**Tanya** 73:33

Yeah. Anyway. I’ll leave you now. Thank you for talking to me.

**Interviewee F** 73:40

Good luck.

**Tanya** 73:41

Thank you. Yeah. Thanks, and have a good day. Bye bye.

Interview G

Thu, 6/4 9:10AM • 27:46

**SUMMARY KEYWORDS**

City, located, material, manufacturing, focus, businesses, recycling, California, report, manufacturers, mm, circular economy, recycled materials, urban, depending, drip tubing, folks, waste, supply, loop

**SPEAKERS**

Interviewee G, Tanya Tsui

**Tanya Tsui** 00:09

Let me remind you why I contacted you. So I met with Katie Stanton from the urban manufacturing Alliance, and she referred me to you. I’m doing a PhD in the Netherlands under the Department of urbanism at the Delft University of Technology. And I look at how urban manufacturing could contribute to circular economy and cities. So that’s very relevant to your work. I thought it would be great to to get a chance to talk to you so thanks a lot for seeing me. Oh, yeah, do you mind that this conversation is being recorded?

**Interviewee G** 00:53

No, not at all.

**Tanya Tsui** 00:54

All right. Because I would like to use our conversation as a part of my research, because I’m interviewing different experts. And it could be that I would like to use what we talked about here in a paper that would that be okay with you?

**Interviewee G** 01:11

Yeah, of course. Yeah. Oh, perfect.

**Tanya Tsui** 01:13

Okay. So um, yeah, I just had a scan of the report that you must have wrote for the upcyclers network. Yeah. Yeah. So I just thought, I will, I will spend this interview asking you basically three questions. The first is how does urban manufacturing or urban industry contribute to circular economy? Why should it be in cities? Or why should it it? Shouldn’t it be in cities, and also finally the drivers and barriers for entrepreneurs who are involved in this industry. I’d like to actually hear a bit more about you first, maybe for a few minutes. Like, how did you end up in this field? And how did you end up starting upcyclers network?

**Interviewee G** 02:14

Oh, my background. I was working in CSR (corporate social responsibility). So I was doing corporate relations for Mercy Corps micro finance in China, and then in New York working with for near tears, and the Aspen Institute, all focused around how do we involve more corporations in socially responsible efforts. And I actually left this space in 2010, because in terms of impact, it (the work) felt incremental. Honestly, I wasn’t really focused on systems change. Circular economy as a concept of the Ellen MacArthur Foundation, I think has started in 2000, I was interested in that but I wasn’t sure about whether it was a real concept or just marketing for CSR. But I stayed in the loop I wanted to start up space for a bit, the freedom loop and then in 2014 felt like okay, circular economy is real. How’d I get involved in it seems like where there was the most need was around how do you actually fill that gap of recirculation of materials. So that’s when I got back into or got into the circular economy space with a focus on more around the materials management side and recycling.

**Interviewee G** 03:40

And then I was working in Germany for the Lidl supermarket chain, but in their materials management division, so when I came back to the US, I really wanted to continue working in circular economy, and so the first report I wrote was under circular colab. So that was looking at what was the state of the circular economy in the United States because I didn’t really see anyone that has done any research and I wanted to see, now that I’m back in the US like, what do I focus on, with a circular economy. And I saw that there does seem to be a need to bring together the businesses that are actually doing the re-circulation of materials by providing that that demand and drive for recycled materials. In 2018, National sword was being implemented and suddenly when it came to the secondary or recycled materials, people were saying, “Oh my gosh, we need to last bolster more development of the mess domestic markets in the US.”

**Tanya Tsui** 04:58

Sorry, what was the incident that triggered that? I couldn’t hear.

**Interviewee G** 05:04

Oh, National First. So this was when China drastically limited the amount of recycled materials. So since then, there has been a huge focus on how do we create more domestic market to process the material because we basically lost a chunk of market. So the upcycling network is highlighting businesses that actually are creating a product from recycled material.

**Tanya Tsui** 05:51

Are you focusing on waste management businesses or manufacturing businesses that use secondary materials?

**Interviewee G** 06:04

So ideally, the initial focus was on the manufacturing side. But it’s so tied. There’s already other businesses that focus on the collection side and processing side. So I’m trying to highlight the manufacturing side, but it’s so intertwined. So a lot of our webinars will go into the collection side and the policies that are needed to make it work.

**Tanya Tsui** 06:39

The manufacturers that you talk to who source their waste, where do they generally source it from? Do they work with a municipality or with make waste management companies or is it more of a b2b thing?

**Interviewee G** 06:58

It varies, depending on their supply needs and what their specific focus is. So, it could be someone like trucks, they may source from commercial suppliers for the plastic lumber because their supply needs are such that only commercial partners can satisfy that. But then there’s other folks that focus specifically on ocean plastics then they might source from more like local collection for domestic, I would say for municipal waste. What I’m seeing is that cities are actually trying to encourage businesses focus on the municipal waste because obviously, that’s more contaminated and the large scale manufacturers don’t want it. So cities are saying, “Okay, can we create eco parks around landfill, and say, whatever we divert, we’ll give businesses either below market leasing rates for their land or some kind of tax subsidy if they agreed to set up.”

**Tanya Tsui** 08:16

That’s really interesting. What is kind of the level of closing the loop that you typically see what what I mean is like when you think of the Ellen MacArthur diagram, which loop do you see, is it more on the outside like recycling or those smaller loops like repairing and sharing?

**Interviewee G** 08:40

So for repair if you want to talk to someone in right to repair. They’re the main thought leaders in the US. I would say recycling as a way, way bigger industry in the US. But I’ve heard or I’ve read that because of the downturn due to Corona interest in repair and businesses that do offer repair or sell repaired good. are seeing an uptick.

**Tanya Tsui** 09:33

Why is that?

**Interviewee G** 09:39

due to supply chain shortages. This is only for electronics, we can’t get them from China. And so these secondhand folks have like much more inventory on stock and folks can’t go buy new stuff, I guess. So they have to learn learning how to fix their items.

**Interviewee G** 10:02

Yeah. But I mean, when I would say in the US circular economy when people mention it, usually their understanding like 70% of the time, it’s definitely more focused on recycling.

**Tanya Tsui** 10:21

it’s the same story on Europe as well.

**Interviewee G** 10:31

Even though I’m focusing on that, to me, like the potential circular economy is way higher up the value chain.

**Tanya Tsui** 10:43

So in the in the, in the report, one of the main objectives was to frame waste in terms of economic value, but that’s often quite difficult. So what are the strategies that you’ve seen, that makes a business economical viable is it? Is it their scale? Is it focusing on certain materials or processes?

**Interviewee G** 11:07

So, if you look at some of the stuff is being on development FBR-DC, they’re one of the goods highlighted, I think they’ve probably done the best job in the US for supporting that economic value. And that has a lot to do with the regulatory environment in the US because it’s state by state and city by city. In the southeast of America, we still do have a lot of manufacturing facilities in general. And so if you’re opening a manufacturing facility, that’s the place where you’d probably find the lowest cost, because the cost of land is cheaper, but also there are lower regulatory hurdles. So then they’re able to create a more closed system of material supply, as well as have lower costs of running operations.

**Interviewee G** 12:05

I’ve heard that transportation is usually the main cost when you’re talking about transporting recycled materials, so even if folks in California might want it (recycled materials), if you have to ship it from Florida, it just ruins the economic value. But if you’re located within like a 10-20 mile vicinity, then it’s suitable.

**Interviewee G** 12:28

So look them up in the report. They have the website but it’s not fancy. But they have I would say the most economic drivers in terms of being a for profit businesses. I certainly don’t even know if they started with any environmental focus. And then in California, we have a program called the recycling market development zones RDZ where there’s 40 of them located throughout California where usually the city manager also has the responsibility to encourage businesses that utilize secondary or recycled material to locate in their district.

**Interviewee G** 13:16

But if you want to locate in Los Angeles or anywhere in the Bay Area, the costs tend to be pretty unfeasible, right? You’re like seeing something really high value. And so I think if you’re looking more inland, so around the Sacramento area, there’s some case studies where folks which were highlighted in the report. But I would say, California is probably more driven by diversion goals. And so companies know that they’re going to get x amount of material. And so that’s why they’re choosing to locate. I would say they are more regulation driven, as opposed to looking for financial reward.

**Tanya Tsui** 14:09

So transportation cost is the highest in the entire operation. And so the closer a manufacturing plant is to a recycler or a source of waste, the better. So where would be the source of waste?

**Interviewee G** 14:38

So for glass I think I’ve heard of businesses during contracts with cities and then their customer will be bottling plants. But I’ve also heard because the southeast has a lot of auto manufacturing. There’s a lot of industrial wastes that can be utilized versus in California like the just isn’t that type of waste. So, in California, an example would be this firm focused on recycling of drip-tubing for irrigation, and they actually also sell drip tubing. That was their original business they’re a company called “Medicine”. They’re in the report. And they figured out, hey, if we collect the used or broken drip tubing, that farmers don’t want, they could actually recycle it and sell it back. And so because they’re located near the agricultural Central Valley region of California, it makes sense for them.

**Tanya Tsui** 15:41

So manufacturers or upcyclers are motivated to be closer to cities or closer to consumers because that means they’re closer to waste.

**Interviewee G** 15:55

With cities it’s harder. I would say that they want to be located close to manufacturers. Like I’ve heard even like, Phoenix was trying to attract folks to be located near them. And to me, Phoenix, I think is the top 20 most populous cities in the US. And supposedly the volume that they were generating wasn’t... they were generating low recycling rates. But I was really surprised by that. That also speaks to the work of Katie, who is trying to encourage growth of urban manufacturing. I would say the scale and profit expectations are very different than some of the really large recycling processors who want like tons coming in monthly, because they’re looking for like X percent returns for their investors. And so I don’t think it’s economically viable to operate within a city and service someone like Phoenix, but I think just depending on who your investors are, and the scale that you’re selling, right, the, because a lot of this stuff isn’t necessarily environmentally driven. But it’s like waste energy - with the investment that goes in and then the financial return, how much of is it worth that initial cost?

**Tanya Tsui** 17:37

So the the people you’ve interviewed in the report, where are they usually located in relation to a city? How far is it away from the nearest city center?

**Interviewee G** 17:55

The report wasn’t a overview of all of the US, is was more highlighting some best practices. So it’s really hard to generalize because California has 40 zones. So they have zones that are located within la Ventura Bay Area, but then you could you’d have to go into each zone to look at, well, what is LA actually doing? Like, how many grants have they given out versus like Ventura? A lot of grants are coming in and out, but that could also be because they have a more well resourced RNDC program, in terms of staff. So, for the city that I would maybe look at Phoenix Charlotte - they are trying to create these like eco hub parks. Or King County, Washington, (are also trying to create eco-hub parks) around the landfills. So this is actually a city led effort to encourage manufacturing companies to locate in the city to focus on municipal trash. Municipal and construction and demolition waste, which in terms of impact is actually 30 or 40% of total trash volume. So depending on on where you’re located, it can actually be more than municipal. So some people actually think cnd waste has more potential because it’s less contaminated.

**Tanya Tsui** 19:52

It’s so similar in Europe as well. It’s around 40%.

**Interviewee G** 20:00

There’s a organisation called construction and demolition association. There’s definitely a industry association that focuses on construction and demolition.

**Tanya Tsui** 20:23

What kind of material flows are they focusing on or why are they motivated to be in the city?

**Interviewee G** 20:36

It’s because the city is trying to help them with their incentives including city facilitation, the permitting process and setup process. Sometimes cities will guarantee to supply this much tonnage a year. And sometimes cities will work with local utilities to help set rates So, it’s again, a case by case basis. Like the city of woodland, they got Aquafill (carpet and textile yarn manufacturer) to locate in their city. They were setting up really large manufacturing facility and so they needed to work with the local utility. On the other hand, there’s Charlotte which was starting an entrepreneurial hub, it sounds more almost like a manufacturing co-working space, the much much smaller scale, where it would be more of an incubator. I’ve heard that, in their first iteration, they said that one possible material was textiles. Not actually coming from municipal waste, but coming from hotels - because apparantly, with sheets and uniform, you could guarantee a uniform standard, with the textiles are coming in.

**Tanya Tsui** 22:17

Would you say that, without municipal incentives, manufacturers wouldn’t move into a city?

**Interviewee G** 22:33

I think it depends on the city, because in the southeast, I think the costs are low enough that it would make sense. Actually Coca Cola, has some of the big bottling plants that have the recycled PT commitments. And Unified is I think, in Atlanta, so they have the Reprieve brand, right? This is all the recycled PT going into polyester. I think if they if there’s already someone like a buyer nearby then they’re willing to locate. They’ll buy recycled PT to make the polyester, so there’s a guaranteed buyer.

**Interviewee G** 23:31

But I think it’s really hard to generalize. I think from the outside perspective, I’ve heard California has a really bad reputation in general because of apparently the regulatory climate. But from folks that have actually opened there, they’re saying, “Oh, it’s not that bad.” But it really depends city by city. What is the city staff like? You know, you have a close relationship with economic development? That is very, I mean, it becomes intensive when you choose to operate at a certain scale in a city. There’s also folks that just don’t want like the whole NIMBY (Not in my backyard), so how do the local people view recycling? Like, do they see that as the cause for pollution? Or do they see that favorably? And that will then depends on what type of material we’re talking about, too.

**Tanya Tsui** 24:40

So would you say that the the main barrier for relocating into cities is is the price of real estate. So if if manufacturers could get closer to customers, they would, but it’s the price of land that’s stopping them or is there something else that’s also stopping them

**Interviewee G** 25:01

I think California land is definitely a huge issue. So the city would rather real estate development or more than I think I’m manufacturing. In other regions, I don’t know. I think it depends on your proximity to apparel suppliers and then buyers,

**Tanya Tsui** 25:52

I think our time is up anyway. So I don’t want to take up too much of your time. But thanks a lot for having the interview with me.

Interview H

Wed, 6/17 7:01AM • 55:20

**SUMMARY KEYWORDS**

Building, reuse, industry, materials, toilets, people, centers, nails, carpet tiles, sell, build, scale, buy, lumber, architect, doors, conversation, building materials, big, designing

**SPEAKERS**

Tanya Tsui, Interviewee H

**Tanya Tsui** 00:11

Yeah, so I’m curious to hear more about your work first before we dive into the topics that I mentioned. So how and why did you start the square square nail consultancy?

**Interviewee H** 00:35

I started it just this year after about 20 years in the reuse industry. I started partly because funding ran out for my job with build reuse. And because I now live on a tiny island off the coast of Maine and and there aren’t too many options out here. So I wanted to do something and continue the work that I’ve done over the last 20 years. But do it in a way that helps a broader range of people in the industry understand why reuse and salvage and deconstruction shouldn’t be more a part of some of the way we think about building. The term square nail came up... are you familiar with what a square nail actually is?

**Tanya Tsui** 01:27

No, actually no.

**Interviewee H** 01:28

Okay. In the old days, nails were hand forged. Okay, about nails now you go to a hardware store and and you get a little box of nails for a few bucks a few euros. And, you know, it’s they’re disposable. But they used to be hand forged, and then after that they were hand cut out of steel. So they would roll out the steel and then they would stamp the nails out. Okay, a wedge shape. So they were square are basically more rectangular. But the design of a square now is like this. So that when you drive it down into the wood, it’s creating pressure that holds it together. Much better than around a straight round nail. So nails were an art form, you know, and they were, they were amazing when when a house would burn down, people would go and collect all the nails out of the ashes.

**Tanya Tsui** 02:24

Hey, like even tiny ones like Okay, wow.

**Interviewee H** 02:28

okay, so nails were nails were serious business, you know? And for me, square now consulting is a symbol of reusing everything we can. Yeah, yeah, nails. Now, believe me. I don’t save all my nails. things apart is not what it’s about. It’s about that concept of going back to a time

**Interviewee H** 02:54

and going back to your point - Why do this consultancy? I want to be in conversation with the people who are doing research like yourself; The people who are teaching, who are designing buildings, the contractors, because they’re the decision makers for the future. The reuse industry for the last 20-30 years has grown as a little grassroots movement, kind of like recycling did before that, and but it’s always been within kind of a vacuum or a silo, if you will, in that the reuse industry has kind of seen the typical construction and demolition industry as the enemy. You know, “they they’re throwing everything away, They’re destroying all the buildings,” historical preservationist have often looked upon builders in the same light, you know, “they’re the evil guys. They’re tearing down buildings and building new stuff, new ugly stuff.”

**Interviewee H** 04:07

There’s a lot of shifting in the architecture community. And what I want to do is make sure that reuse remains a part of that conversation. You know, if we’re talking about sustainability, if we’re talking about circular economy, if we’re talking about zero waste, how can we have those conversations and building those ways and not incorporate reuse? And not talk about how that buildings that were taking apart, have valuable materials, some of which can’t even be replicated. Can’t do it again. You know, on the West Coast here in the US, they were to build San Francisco and Seattle and Portland, they were logging 250 foot redwood trees to frame houses Yeah, you know, you get into some of those old homes from the 1920s. And, and the the two by four, two by six two by eight that are framing the houses are clear, solid old growth Redwood.

**Tanya Tsui** 05:15

Wow.

**Interviewee H** 05:17

You know, and I’m sure in the Netherlands and in Europe, there there’s a much longer history of buildings. So there’s probably equivalence or or, you know old, old chestnut barns and with amazing wood and other materials. And I think actually Europe has it way ahead of America as far as salvaging materials and making best use of things. Because, you know, even modern cities in Europe are sometimes built on the ruins of the Roman Empire, whereas America does not have that culture, or that concept at all. Yeah, Are you American?

**Tanya Tsui** 05:57

I, um, I grew up in Hong Kong. And I am living here for four years. I’ve lived for four years now.

**Interviewee H** 06:05

Your accent is very American. That’s why

**Tanya Tsui** 06:10

I watch a lot merican TV shows.

**Interviewee H** 06:14

So, you know, America being so new relatively, and our building boom, our serious building boom, what most people experience in buildings, especially homes in the US are post 1950. They’re built like shit. Post war, or suburban landscape. And so there’s not the same awareness of history and quality of materials as, as I’ve heard of in Europe. So part of the conversation and part of why I’m doing what I want to do, what I’m doing is creating conversations with key decision makers who are going to change the way we build in the future. We’re changing the way we build in the future. And making sure that reuse and deconstruction of buildings for reuse remain a part of that conversation. That’s a very long answer.

**Tanya Tsui** 07:22

Just to get a better idea of the building reuse industry, what what does a building reuse operation look like? Are you looking at people who are taking buildings apart? Are you looking at people reselling? Are you looking at designers who are designing for things to be reused? What do you mean by the building operation industry?

**Interviewee H** 07:44

Yes. All of that.

**Tanya Tsui** 07:46

Okay. Like the whole the whole chain

**Interviewee H** 07:50

I’ll draw a distinction back in the post war because pre world war two buildings were all taken down by hand and and things were naturally salvaged. world there’s a really amazing book. See if you get your hands on it, it’s called “Bulldozer” by Francesco Russello Amman. I can’t remember the full name of it but it’s an amazing book and she talks about the post war landscape and how bulldozers changed how we build and how we think about our landscape. Brilliant book. If you can get a hold of her - she’s even busier - you’ll have a wonderful conversation with her. She teaches at the University of Pennsylvania in Philadelphia. She’s awesome.

**Interviewee H** 08:54

Anyway, during pre-war times, when buildings came down, there was a huge industry of people that would dismantle buildings, sell the parts - and this could be anything from a Tiffany chandelier down to a bucket of nails. Nothing went to waste. Then they started demo-ing (demolishing) these buildings, blowing them up, tearing them down, you know, wasting all these materials. The only part of the industry that survived initially, were the people going for the high end material. People going for the Tiffany chandelier and the people going for the doorknobs and the architectural millwork so that industry thrived even during demolition times.

**Interviewee H** 09:46

So most of us my age, remember back in the in the 60s 70s 80s when you could, when that was the only reuse of building materials there was, and they were very high end, you’d go to these shops where, you know, like a, an old fixture or a lamp was really expensive. And it was it was a micro part of the industry that survived. The part of the industry that salvaged lumber and brick and tiles and flooring and all of that, just went completely underground and was pretty much ignored. It wasn’t until the 80s that some folks started reviving that through doing what we call handy construction, which was what used to happen in the old days, and they would salvage 70 80 90% of the materials.

**Interviewee H** 10:45

So that was kind of the birth of our industry along with what are now called reuse centers, which is where they would stockpile this stuff, and then and then try to sell it and there’s everything In in the mix in there, as far as types of materials I ran for when I was in Portland, Oregon, I ran 4 reuse stores, they were habitat stores, habitat for humanity. We were one of the largest operations in the country. Four stores probably about 110,000 square feet total. I don’t know if you can translate to metric metric on that, but they’re big stores. And we were selling everything furniture all the way to doorknobs, to lumber to windows, doors, all of that. We were one of the bigger operations, most of the reuse centers in the country are much smaller scale, what we sometimes call mom and pop operations, you know, very small scale. Not a whole lot of product going through

**Interviewee H** 11:58

Where the industry has struggled is because it was grassroots, and because it grew up out of a bunch of do-gooders that were often more in love with the materials than they were the the economic engines driving what they were doing. And we ended up with an industry that was very much working under the radar, working very locally, very community driven, all of which are its strengths. But it’s also its weaknesses. When you talk about how to integrate it with the building industry, you know, the building industry is massive! You know, we’re in these little reuse centers scattered all over the country, selling to handyman Bob, and, you know, people working on their own home, small time contractors - all of these people who were who are mostly what we call needs based. So that’s how our industry has grown up. And that’s who we’ve typically served.

**Interviewee H** 13:12

The conversation now is starting to be how do we have that conversation with architects, designers, builders, developers, so that we’re not just grabbing the Tiffany chandelier, or the 1920s wall sconce, or the beautiful Redwood, but that we’re going beyond that, and we’re saying how do we design and build for the future so that all of this material doesn’t get wasted? You got a long answer to your question and I’m not even sure I answered it.

**Tanya Tsui** 13:52

You answered perfectly. I really like it. I forgot to mention that Studio Rotor were my teachers for one semester. And so I really like the story.

**Interviewee H** 14:08

you know, Elma? I’m butchering her name. She developed the BAMB. Well, you need to you need to look them up and find them, they’re right in the Netherlands. Buildings as material banks.

**Tanya Tsui** 14:29

Yeah, I remember that. I think it was some. Some of my colleagues are involved in them. So you were saying that before there were all kinds of reuse operations that we’re doing recycling everything from bricks to high class chandelier. But then after the demolition came in only the chandelier we users survived and what what was actually what killed the other cheaper material reuses? Was it like increased labor cost or cheaper raw materials?

**Interviewee H** 15:13

Yeah, you need to read Francesca’s book. She She did her whole PhD on this. And her book is basically her PhD. It was a number of things. One it was the bulldozer and the way can make the mechanical way in which we’re able to destroy buildings really fast.

**Tanya Tsui** 15:37

So it’s like before, they didn’t even have a choice. Like you don’t have a choice to bulldoze or demolish. You could only deconstruct, so you migh as well sell the materials, right?

**Interviewee H** 15:51

Yeah, if you wanted to a building gone, you had to burn it, or you had to take it apart by hand. Whether it’s a barn or a skyscraper. There’s a famous story I forget what building it was. But there’s a famous story is the last building last skyscraper in New York City that was deconstructed. It was big. And they tore it all down by hand.

**Interviewee H** 16:15

And I think Francesca talks about that a lot in her book. Yes, they, they had no other choice. There weren’t bulldozers and cranes with wrecking balls on them. So those tools were developed. And they were developed by and large, or they were really expanded in their design and in their abilities during World War Two, when the US went to to the Pacific. The reason that the tide of the war turned is because we brought machines and we were able to clear roads and clear land field and air strips in a way that the world had never seen before. And that changed how we thought about construction. And have you ever heard of the term fighting CB’s? They were a whole division of the US Army that was trained to build. Okay. And you know that they were also soldier, but they were trained to build and they would go in and clear land and create air strips. And that’s how the US got there so quickly and got established so quickly within the Pacific and turn the tide of the tide of the war, because no one even knew how to keep up with it. And all of the people who were doing that work when the war ended, came back to the states with the skills on construction and on demolition.

**Interviewee H** 17:56

Yeah, and along with the expansion of suburbia out of the cities, and all of the issues with that, and economy growing and people getting paid better and all of that, this gets back to your your cost of wages, you know, cost of wages were going up, you could no longer hire a group of 50 immigrants to pull the nails out of all your boards, or knock the lime off of your bricks, and that really changed things. So there were a lot of factors.

**Interviewee H** 18:38

But the one thing is that people were willing to pay for was the higher end stuff. It justifies the labor and the time, because you say, “Okay, well, this building’s coming down in two weeks.” This is still a conversation we have in our industry, “Buildings coming down to two weeks ... you want anything?” Like well, yeah, we want everything but two weeks is not enough time! So you go in, you take the solid oak banisters the the windows, the solid doors, you know, you take the beautiful stuff that you can get within a two week window before it (the demolition) starts. And that’s what a lot of our industry has been doing for the last 20 years.

**Interviewee H** 19:26

Right now we’re trying to slow the building people down the slow the contractors and the demolition folks down and say well, wait a minute, we can do a lot more. If we get it in if we start the conversation early. Yeah, usually they call us after all the contracts are signed, after the new buildings all designed. And then they call us and say this building’s coming down. Like I said, “buildings coming down in two weeks. Do you want anything?” Why weren’t you talking to us six months ago? You’ve been working on this for two years, and now you’re calling us and asking us we want anything.

**Interviewee H** 20:01

And when you talk about that on the scale of a 1000 foot home that’s one conversation. Sure, I can get into 1000 square foot home, and, get a lot of materials quickly, even if I don’t dismantle the entire thing. But talk about an office building, you know, something with an incredible amount of material. How do you say, “Alright, what do you want here?” To a ten story office building? You know, that conversation needs to start when the architect and the builder and developer first sit down: “what are we going to salvage here? What are we going to reuse within the same project?” You know, and and there’s an amazing amount of work that can be done and that will save money because your money buying all that material new material and not transporting all that material you know, how do you reuse as as much as possible to make it cost effective? And the only way you can do that is by planning early.

**Tanya Tsui** 21:26

What is the scale of the biggest building reuse operation you’ve seen? Do they work at the scale of the neighborhood, regional, or national scale?

**Interviewee H** 21:45

My old store was in Portland, Construction Junction in Pittsburgh. There’s there’s probably a dozen around the country; Star Dust in Phoenix. There’s maybe couple dozen around the country that are big outfits. And when I say big, probably the largest square footage is 100,000 square feet plus acreage plus yard space and even the largest are still working mostly local.

**Tanya Tsui** 22:21

You mean sourcing from local, within the city?

**Interviewee H** 22:28

Yeah sourcing sourcing material locally and reselling it locally. Some people do take stuff and... I got distracted. There’s a duck with ducklings walking through my yard.

**Tanya Tsui** 22:52

Hey, let’s see. Let’s see!

**Interviewee H** 22:54

I don’t know if you’ll be able to their their way across. They’re walking right behind the purple flowers. I’m sorry. What was your question? I got distracted.

**Tanya Tsui** 23:16

You were saying the even the biggest reuse operators are sourcing and selling locally.

**Interviewee H** 23:25

Yes, for the most part. There are some folks that expanded out of Kansas. There’s another guy on the west coast, I think, that are shipping things east, to Asia, in shipping containers. There’s some of that starting to happen because the cost of shipping is still worthwhile for people to import, mostly timber. So you can get away with windows, doors, large amounts of the same toilet that kind of thing.

**Tanya Tsui** 24:07

So shipping reused building products from from the US to Asia?

**Interviewee H** 24:14

Yes. To sell in Asia. I’m not sure how the economics work, but we can actually get used building materials from here to either Mexico or Asia and keep them more affordable than buying new. Okay, which doesn’t happen so much in the US which is part of the problem here. Buying new materials is typically so cheap here, that it defeats efforts to reuse. And nobody in the building industry wants to look at it this way or talk about it this way. But the building industry is heavily subsidized. The US doesn’t like to talk about what it subsidizes, we’re like, “we’re not socialists, we don’t do that.” But goddamn we do. We just subsidize private industry.

**Interviewee H** 25:21

And the building industry is completely dependent on foresting and national forests, which are all owned by the government and paid for by our taxes. The rail industry, the trucking industry, all heavily subsidized through through highways, rail, all of that. So, if our materials actually cost, their true cost, reuse materials would be far cheaper. But because everything within our economic system makes building materials cheap, because construction is a huge part of our economy, it’s the linchpin of our economy. And it’s not very smart because you can only builds so much. But as our economy is built on, on construction and building, then government wants to keep seeing that the materials for that as affordable as possible. So that construction will continue. And then the same with with disposal - disposal fees are incredibly low here in the US. You know, it’s it costs next to nothing to throw things away. You know, $30 a ton in some states.

**Interviewee H** 26:48

You know, when you when you make new materials really cheap by subsidizing them, and you make it really cheap to throw stuff away, and you build an economy that’s based on on buying new stuff and throwing it away. And that has to do with the whole circular economy is talking about that that has to do with whether whether or not you’re talking about a TV or a couch, or a building. It’s the same conversation.

**Tanya Tsui** 27:21

I’m really surprised that, that the cost of building material is is cheaper in the US than in Mexico and Asia. You would think it was the other way around.

**Interviewee H** 27:35

I think that the point is, not that it’s cheaper there. But the cost of labor here is so high that the building industry just says streamline construction as much as possible. So they can’t be bothered to deal with used stuff. Whereas in Mexico or in Asia, they’ll say, we’ll deal with the used stuff. Because we got bodies that will tear this stuff apart. We just don’t have the raw materials. But, you know, if you send lumber, it’s almost impossible to pay people to take nails out of lumber.

**Interviewee H** 28:37

Whereas, you know, again, back pre war in the US, it was easy to find those things right now. Oddly enough, I’m building my chicken shed here from all scrap material that I’ve saved that I found on the beaches. And from some I’ve collected from neighbors and stuff, with a lot of nails in it. So I’m de-nailing everything. But part of part of the reason why it makes sense for me is I have a lot of time on my hands right now. So I can spend a half a day pulling nails out of collecting lumber from the beaches and pulling the nails out of it. A year ago, would have been unheard of to spend my time that way. It really comes down a lot to to labor force. And how we choose what we choose to value.

**Interviewee H** 29:32

Another aspect of value on materials and true cost, is that when we think about the cost of building materials, are we think of the cash cost of building materials, we’re not counting the environmental impact. Now, if we taxed a two by four (piece of wood) based on its environmental impact, people would be screaming for used two by fours. So there’s so many factors in here beyond that. You know, when I started in industry 20 years ago, it was just, “let’s collect whatever we can get our hands on and sell it to the guy down the street who’s building a chicken coop and needs a cheap door.” The conversation has really expanded far beyond that.

**Tanya Tsui** 30:28

I see. So, so most of reuse industry operations are local. What is stopping them from expanding and scaling up?

**Interviewee H** 30:43

two factors. One is a willingness to embrace change. People who have been doing this for a long time, like the way they do it, and it works for them to a certain degree. There’s also a lack of investment. You can find investments in find money to work on a local scale, but to start scaling it up regionally statewide national, you need funding. You know, recycling would be a really good example. Recycling industry went mainstream went national, because they had serious funding. Because there was money, and economically it made sense, “let’s take all this glass and grind it up and resell it to the glass manufacturers. Yeah, I can make money off of that. Great. Let’s do it on a big scale.” It’s very simple. It’s hard to do that with small one-sie two-sie pieces of lumber or toilets or whatever. It’s hard to scale up. And to scale up to that degree, you need to have a market.

**Interviewee H** 32:11

Now, if I’ve got 300 toilets, who am I going to sell them to? You know, even if they’re identical, even if they’re beautiful, identical, brand new toilets, who’s going to want that many toilets? I could sell one a week or one a day, even for a year for two years out of my store. But the trick is, how do I sell 300 to one person or to one builder? I’ve got to get to that builder, that architect, that designer who will say, “Hmm, you can give me 300 commercial Kohler toilets, for less than half of what I would have to pay to buy them new, they’re all ready to go in a warehouse, I can come get them? Yes. Great. I’ll buy them.” So, maybe a 1500 dollar flush toilet, commercial toilet, I can sell to him for $700. He saved a lot of money doing that.

**Interviewee H** 33:18

But he has to know where to look for it, to know he can find it. You know, when architect works, they’re designing this building, they pull out their spec book, and turn to the page of toilets. They see this number. They plug that number in - ‘color x 3G251...’ That’s spec, he’s done. He didn’t have to do another thing with that. If he puts in the specs, find 300 used toilets. That’s a whole other level of complexity. And the architect designer doesn’t typically want that or hasn’t. If the builder gets a hold of that spec, he’ll say, “Where the hell am I gonna get 300 used toilets?” So there are the people like me who are running reuse centers. Someone offers us 300 toilets, we say, “Well, I can’t take 300 toilets, what am I gonna do with them? I’m gonna warehouse them forever and sell them one-sie two-sie.

**Interviewee H** 34:18

So there’s that gap between who’s going to buy it, and who’s going to supply it. There’s tons of material out there. But how to connect those dots is something our industry has only been able to do small scale and locally. Now, if I had a warehouse space where I could store 300 toilets, and a way to market it to architects to say I have these toilets, they’re yours. If you want them and you’ll save $50,000 on it. Then we can have a conversation. But until architects and designers and developers are willing to embrace planning and buying for reuse, the warehouses and the market is not going to develop on the other end. The markets are not going to develop on the other end until someone someone wants to buy it at that scale. And that’s right where we’re at right now. How do we start creating conversations that build supply and demand simultaneously, to get it from out of just being being local onesie twosie sales? It’s a big question. It’s the question.

**Tanya Tsui** 35:46

Every batch of things that come into a reuse facility is unique. So it’s very hard to scale up because the definition of scaling up is that you could do the same thing over and over again. But if you’re reusing toilets, and doorknobs and doors and windows, that’s not possible, right? Is that also a part of it (the problem)?

**Interviewee H** 36:11

You might have touched on part of the answer. I’ve never thought of it this way, but maybe, maybe part of it is getting into breaking our industry down, and being more specialized. I know a fellow in Pittsburgh who’s doing just commercial doors. That’s all he handles. And it’s a nice little niche and he’s hoping to replicate it around the country. You know, commercial doors, I couldn’t sell in my stores. Again, an architect wouldn’t want to come look through the 300 doors lined up on my wall to find the half a dozen doors that he needed. So the model that we’ve created in reuse centers over the last 20 years was only successful because it because it met the needs of local communities for cheap materials. That’s how the industry got built. But we’re not going to hit a tipping point or become mainstream just on that kind of usage or on those kinds of sales. We’re only going to tip that point over the edge to becoming mainstream when we make it easy and affordable for for a large amount of materials to be reused. And that’s going to take systems thinking, it’s going to take infrastructure, it’s going to take funding on a scale that recycling saw that reuse isn’t.

**Tanya Tsui** 37:56

it’s also about whether it’s reliable, right? Let’s say my warehouse has 300 toilets. And then an architect comes and I’m like, “do you want these 300 toilets?” And the architect is like, “Damn, I need 330!” and then they go buy 330 new toilets instead.

**Interviewee H** 38:19

Yeah. And you also touch on reliability and their warranty issues. You know, you buy 300 new Kohler toilets. They’re all warrantied and you know what you’re getting. You know if there’s any problems, they’re backed. You by 300 use toilets for me, how am I going to warranty them? I didn’t set them up and test them.

**Tanya Tsui** 38:47

I don’t think you can.

**Interviewee H** 38:52

So there’s, there’s a risk element that a lot of people aren’t willing to take because just like an architect is spending other people’s money. It’s not coming out of their pocket. You know, they don’t want to take the risk to spec used materials if they’re not warrantied because then that liability goes on them. Whereas if it’s speced new and bought new, if something goes wrong, it’s not their problem. There’s so many complications, so many issues to it all.

**Tanya Tsui** 39:29

Yeah, I love it. But, so the building reuse operations that you see in your community as are they mostly, like the habitat stores where they just sell everything like from toilets to doorknobs?

**Interviewee H** 39:48

Yes, that’s the way the industry is developed. And again, it came out of, you know, the architectural salvage folks taking all the premium stuff, all the really nice stuff. And so these local organizations came in to get the next layer down to supply local needs. And like I said, typically needs based; they used to say with the renewal center - you want your reuse center close to your wealthy donors, but also close to your poor buyers, kind of right in between. Because that’s the way the material drifted. And what we’re talking about is is trying to get it to (the point where) it’s not just a “robin hood” thing, you get the illusion? I think that’s a good illusion, because I think most of the people within the reuse industry have a robin hood complex. You know, we’re stealing to the rich from the rich to pay for the poor, you know, to help the poor, to give to the poor, that that’s a huge part of the mentality within our industry. And maybe don’t quote me directly on that, it might get me in trouble.

**Interviewee H** 41:30

But there is there’s a, there’s logic to that. It’s how the industry has grown. And we’ve met a tremendous amount of of need in doing that. But on the other hand, again, it’s about, how do we scale it? How do we get to that point where 300 toilets don’t get thrown away because no one knows how to salvage and market them, and no one’s gonna buy it?

**Tanya Tsui** 41:58

It’s like how do you move from people making a chicken coop in their backyard, to selling to an architect that is going to build an office building that has 500 toilets.

**Interviewee H** 42:12

Mm hmm. Right. And 1000 doors. Yeah. And, you know, there are folks doing it with ceiling tiles. The ceiling tile industry is actually pretty good with this. So is the carpet tile industry. These things are made to be replaced. So, it’s been industry led in both those industries, to reclaim materials. Armstrong in particular, and what’s the tile manufacturer, they’re out of Georgia... I can find out and send it to you if you’d like. But there are industries that are taking just a piece of this. If you were saying, maybe someone just does doorknobs, so these are creators of new carpet tiles, who will take back their tiles. And, when someone calls and wants new tiles for their office building, they’ll take the other ones away. They’re typically recycling, but they’re turning them into new carpet tile. So that’s a big step within the industry.

**Interviewee H** 43:33

Now I could get to truckload of carpet tiles to my store and I could sell them, they’re very sellable. But, again, it’s about commodity, it’s about the size and the ability to to sell and move. Carpet tiles are easy. Ceiling tiles are easy. How do we find those other pieces within our industry like this fella in Pittsburgh, doing just commercial doors or some other wonderful niche? How do we expand those niches? So yes to answer your question, most of the reuse centers have been soup to nuts.

**Tanya Tsui** 44:16

I’m sorry, what’s soup to nuts?

**Interviewee H** 44:22

Soup to Nuts. Soup is the first course in a meal. Nuts are the last course. And everything in between. So, most of the industry has developed that way. Because that helped meet the local needs, which was, who the market was. I couldn’t run the stores I ran if all I sold was doors or toilets. I’ve got a, contractor coming or a small contractor homeowner coming in, he wants to be able to get a toilet, a door, a couple of windows, a bucket full of old nails, you know, whatever you need. That’s the way the industry is developed. But that doesn’t work for building industry as a whole. Because they can’t call us and say, “Hi, can you drop off 10 of these, a dozen of these, and 200 of these?” (My response would be,) I don’t even know if I got them in the store, come look, you know, it doesn’t work that way. So how we bridge and how we marry the building industry, with the reuse industry is a really big question because they’re in so many ways of living on different planets.

**Interviewee H** 46:01

And part of it is cultural. You know, the the the suits and ties for designing our buildings are very different folks. Then the bearded...

**Tanya Tsui** 46:17

Chicken coop building...

**Interviewee H** 46:19

Chicken coop building nutters that are running reuse centers. Yeah. You know. And, you know, we don’t, we don’t talk to each other very well. You know, you’ve caught me at home with, my cap on and on my T shirt, but I can talk to architects. You know, I was a builder for years before I got into reuse. So I know both worlds and I think that’s why.

**Interviewee H** 46:47

Getting back to your original question. That’s why Square Nail Consulting is so interesting to me. Because I’ve got experience as a builder, I’ve worked with a lot of architects and designers and high end consumers, and on the other hand, I’ve worked in these reuse industries and really served people in need within local communities. And I love doing both.

**Interviewee H** 47:19

How do we combine the benefits of both of them? The building industry is really good at building scale, really good at being efficient, systematic, lowering costs. The reuse centers are really good and involving community support. integrating the goals of a community. A developer might come into a city like Pittsburgh, and start developing a neighborhood, and there’s riots because of the gentrification that occurs. (On the other hand,) the reuse center in that area might have been serving that community that was living in that neighborhood for the last couple of decades, staying in Pittsburgh in particular. Serving that community, helping to meet their needs, (but then the) developer starts, tearing down blocks of old housing, and putting in new homes and attracting new buyers, then those people that have lived there for generations get pushed out.

**Interviewee H** 48:32

So, what makes the building industry really good and really competent and really efficient, is the same thing that works against community building. And what makes reuse centers really good at building community makes it very hard for them to work within within the systematic mindset of builders and developers.

**Tanya Tsui** 49:00

Are building reuse centers even motivated to scale up into a commercial scale?

**Interviewee H** 49:12

Some are, but even those who are motivated in that direction don’t quite know how to bridge that gap. They’re there. And that’s where I go back to funding and research there needs to be serious capital invested in how to create an industry. There’s one fella out of out of Seattle who’s doing something called “Recapture It” (https://www.recapturit.com/). It’s an online marketing tool for reselling building materials. It’s finally live after three years of development. And he’s trying to make a stab at creating a an online marketplace for building materials.

**Tanya Tsui** 49:59

(That would) probably maybe solve some of the “330 toilet” problem.

**Interviewee H** 50:07

That’s what he’s trying to solve. Yeah, if I can find if I got 300 toilets here, I mean from an office building, and there’s someone in St. Louis 2000 miles away, but once again, it could still be cost effective to ship it all the way to St. Louis. Right.

**Tanya Tsui** 50:32

I see we have 10 more minutes. I I have one last question, which is, is the building reuse community motivated to stay in urban areas? Because you mentioned that building reuse centers need to be close to the rich donors and also the poor consumers - Is that something you see, are they in urban areas?

**Interviewee H** 50:59

Most of the bigger ones are in urban areas. But I think it’s an overstatement to say that they’re all in urban areas. There are tons in small cities throughout the US. The rural communities, not so much. You know, like, where I live, there’s 60 people on our island. People here are just like, “I’ve got this door, you want it?” Yeah, very different culture. And I think a lot of real rural communities share more and save some in a barn and just kind of kind of do it more as a part of life. And rural communities at this point typically couldn’t support larger resource.

**Interviewee H** 51:53

So it’s about the amount of materials and the amount of buyers that’s not to say that a reuse center couldn’t be rurally located, but still access materials from the city. Part of the thing that previous centers really struggle with is high real estate. How do you afford a big warehouse in the middle of a city? Now, in placed like Detroit, or in the old days in Pittsburgh, that was easy, because there were all these abandoned warehouses. I built our our business in Portland, Oregon, in the same way, it was easy and cheap to get warehouse space. But if I were to build that now? Couldn’t touch anything. It’s just real estate (prices) through the roof. So could we locate our centers out of out of town? It would allow costs to come down for storage, but then who are our buyers? It’s not going to be the guy from down the street who’s building his chicken coop because he’s not going to drive out into the country to get what he needs.

**Interviewee H** 52:59

But with 300 toilets, I don’t need 300 toilets sitting in expensive warehouse in downtown. It can be an hour’s drive out into the country. So it’s a good point. I think people are asking the question, but again, it’s that if we shift from being in the urban centers where there’s wealthy donors and impoverished shoppers. If we shift that model to a rural center where we gather materials, who are our buyers? So it really is like an Amazon shipping center. It all becomes about shipping.

**Tanya Tsui** 53:49

Yeah, yeah, indeed. I would imagine if it’s further away from city centers, then it could increase in size and suddenly it turns commercial.

**Interviewee H** 54:03

Yeah, yeah.

**Interviewee H** 54:07

Sorry, we’re breaking on each other.

**Tanya Tsui** 54:15

Thank you so much for the interview.

**Interviewee H** 54:54

Oh, you’re welcome. It’s really nice to meet you. And thank you for the work you’re doing.

**Tanya Tsui** 54:58

Yeah, thank you as well. It’s really, really cool. I like that as well. It’s really cool. I like this.

**Interviewee H** 55:06

I keep keep in touch. Let me know what you’re what you’re up to.

**Tanya Tsui** 55:09

All right. All right, you too.

**Interviewee H** 55:13

Okay, well, bye bye