[music]

CHILD 1: When I grow up, I wanna be a stunt double.

CHILD 2: I want to be a YouTuber.

CHILD 3: I wanna be a tailor or an actress to star in movies and plays and stuff.

[music]

SHAWNE McKEOWN: Hey Ray. Ever feel overwhelmed by the challenges facing the world right now? Climate change? Increasingly polarized politics? Precarious employment? Automation? Arghhhh.

RAY HARRIPAUL: Serenity now, Shawne, serenity now.

SHAWNE McKEOWN: Deep breaths. It's all a bit overwhelming sometimes, isn't it? The constant bombardment of bad news. It makes it hard to see positive ways forward and, I don't know, viable solutions to complex problems.

RAY HARRIPAUL: I hear you, Shawne. A hundred percent loud and clear. But today we're talking to a man who has a bright and bold vision for the future, particularly when it comes to the economy and jobs and building resilience to handle climate change.

SHAWNE McKEOWN: Acclaimed author, economist and social theorist Jeremy Rifkin is going to talk to us about his vision. A movement that will turn capitalism on its head.

RAY HARRIPAUL: We're in the sunset of the fossil fuel age, he says. And the push to build out a connected and smart global green infrastructure will create a surge of employment. But for how long? He addresses this in his latest book, *The Zero Marginal Cost Society*. He spoke at George Brown College's Philosophy of Education conference this spring.

JEREMY RIFKIN: It's clear that the industrial age that we've become familiar with is in convulsion. But now we have a more serious crisis that came about because of the industrial age and that is we are now in real time climate change.

SHAWNE McKEOWN: The world's scientists say we have just over a decade to make immense changes to avoid the irreversible and catastrophic effects of climate change.

RAY HARRIPAUL: The changes Rifkin says need to happen involve a third industrial revolution transforming our communications, energy and transportation systems with digitalization and automation. Some of this work is well under way. Welcome to Work Shift.

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JEREMY RIFKIN: So I think that we will continue to see a movement but this way away from drudgery and I think Lord Keynes got it right back in 1931 or '32 at the height of Depression. This great economist scribbled a little six-page letter to his grandchildren saying, "My hope is-- why do we have to remain where we are? Let the machines do this." And he's right. If we would've remained in serfdom and would have said well, there's nothing else we can do. There will be serfs or there'll be slavery, we wouldn't be where we are now. And what I would say is this: if we get any of this right by mid-century 2050, I would think the grandchildren then look back at their grandparents the Millennials and say well, what did your parents do for a living? Well, back around the late 1990s, 2000, your great-grandfather was driving a truck back and forth 10 kilometres a day, five days a week. And they would say, what? Driving a truck? And great-great-grandmother, she was on an assembly line taking products off and putting them in plastic bags and putting them in boxes. They'll be as incredulous as we are when we hear about slavery and serfdom. That's if we get it right.

[music]

RAY HARRIPAUL: Digital disruption.

SHAWNE McKEOWN: The gig economy.

RAY HARRIPAUL: Artificial intelligence.

(Synthesized Voice) Robots.

RAY HARRIPAUL: There's a lot of talk about these things in the media and online but what do they mean for you?

SHAWNE McKEOWN: I'm Shawne McKeown.

RAY HARRIPAUL: And I'm Ray Harripaul.

SHAWNE McKEOWN: We're exploring the future of work and changes you can expect to see at your job.

RAY HARRIPAUL: We'll tell you have this massive digital shift could change your career and what you can do to adapt, evolve and thrive.

SHAWNE McKEOWN: Today, we're talking to American economist and author Jeremy Rifkin. He's written 20 books including, *The End of Work*, *The Third Industrial Revolution* and most recently, *The Zero Marginal Cost Society*.

RAY HARRIPAUL: Rifkin has advised German Chancellor Angela Merkel and other world leaders including the European Union and Chinese officials on the third industrial revolution and the

future of green technology. We recently sat down with him at George Brown College's Waterfront campus.

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SHAWNE McKEOWN: As you have written in *The Zero Marginal Cost Society*, you expect another great employment surge for the next generation and potentially the generation after that as we convert our infrastructure, energy and transportation infrastructures. How much of that work that will be created in those available jobs, how much of that do you think will be temporary work? What kind of work do you think it will be? Will it be sourced by the gig economy or will there be plenty of stable, full-time job opportunities?

JEREMY RIFKIN: Well, you know, I wrote a book called *The End of Work* back in 1995. It wasn't clairvoyant and many of us saw automation coming with digital technology revolution. It already had a big impact on the factory floors and now it was just beginning in the white-collar industries. And we projected at that time it would move to the knowledge and professional sectors as well. But I think it was in the first page of that book I mentioned a third industrial revolution. So I think we have to deal with this on two levels. We are moving to an automated world over the first half of this century. By 2050, if we make this transition into a third industrial revolution smart digital infrastructure, we should be able to manage some of the basic goods and services that we provide with very little human labour. And then the question is, where does the workers-- where do they go from there? But let me deal with the first proposition, the third industrial revolution. We have to transform the entire infrastructure of the world and because of climate change, we're on an emergency agenda to transform much of it in 10 years and all of it in 20 to move us off of fossil fuel culture and the whole infrastructure based on it. So where we stand now, we're in the death knell of a second industrial revolution infrastructure based on centralized telecommunications, fossil fuels and nuclear energy and internal combustion road, rail, water and air transport on top of a built infrastructure which are passive suburban build outs. That infrastructure is in a death knell because fossil fuels are now exiting. I don't think anyone listening to me now believes that we're in the sunrise or even the plateau of the fossil fuel civilization. And even if we were, we'd have to transform ourselves because now we're facing real time climate change and the sixth extinction of life on Earth. We have no choice. Having said that, the coming together of a communication internet which is now here; 4 billion people connected. Pretty soon everyone will be connected and we're moving to 5G big data and maybe 10G big data with cable. So we have the world connected at very low fixed cost and near zero margin because everyone's communicating with everybody. And sharing personal communication, news, knowledge, entertainment, research, everything. What's happened more recently now is that we are now beginning to see the convergence of this digitalized communication the last 20 years with a digitalized renewable energy internet. Where millions of people right now today are producing their own solar and wind off-grid and what they don't want or need, they're sharing it back on a digitalized utility grid and renewable energy grid in exactly the same way they share news, knowledge and information on the communication internet. It's the same exact technology. And now these two internets, the communication internet and now the renewable energy internet, both digital, are now coalescing with a third

internet, a mobility and logistics internet made of autonomous electric vehicles. Those electric vehicles will be powered by solar and wind from the energy internet. They will be driverless on road, rail, water and air over the next 10 years and they're gonna be made of fabricated recycled material. All of this is in the works and already happening; none of it theoretical. And all three of those internets ride on top of the platform called the "internet of things". So putting sensors across the entire built environment and agricultural fields and factories, warehouses, smart homes, smart vehicles. And they're registering real time data what's going on. And by 2030, we will have built out a global brain and nervous system with this internet of things where the whole human race will be able to connect in terms of how they communicate, power their societies with energy, how they move around with mobility and how they live in their environments, their buildings with this new infrastructure in place. This infrastructure requires massive employment to put it in. Once it's in, it's automated and work will go to another sphere which we'll mention. But robots and AI will not decommission nuclear power plants and the whole fossil fuel infrastructure which is gonna have to be done. Humans have to do that. Robots and AI will not put up wind turbines. If you've ever seen a wind turbine assembled or solar, it's going to require human beings. It's very, very difficult and requires agility. Robots and AI will not put fibre and underground cable for 5G or 10G. Robots and AI will not retrofit buildings. Human beings will have to do that. Robots and AI will not put in charging stations and monitor the technology. So when we take a look at all of this we realize that we have 20 years across two generations, the Millennial and Gen Z. We're gonna require millions of workers. It'll be across the board from semi-skilled to skilled to professional to conceptual. But even the semi-skilled have to have a lot of knowledge in digital technology but they already do. They're digital natives at home. They don't need much of that. So all of that's coming. And I think that the key is, where does the employment go after that? What we said in *The End of Work* is, it's not the end of people contributing to society. People are not just going to sit around getting income to do nothing. We are a social creature. We want to contribute to our communities, our life. We want to have a bio, a history. We know where it's moving. The employment will move to the social economy, the non-profit sector, the sharing economy because that's where you have to have human beings. You'll never have a robot preparing a two-year-old in a childcare centre to be a human being, I'm sorry. I don't care what Silicon Valley and all those tech folks have to say about it. We're seeing a younger generation of Millennials and Gen Z, they're becoming aware, they love the technology but they're becoming aware what you can use it for and what you can't. How the socialization of this technology is going on now. The technical love affair is over but we're not going to eliminate the technology. I believe that right now, 10 percent of the U.S. workforce is in the non-profit sector; 15 percent in California; upwards of 15 percent in Europe. All over the world, the non-profit sector is the fastest growing sector. It deals with education and culture and environment and public health. These are the critical sectors that require more intelligence than machines can give us. They're adaptive, they're conceptual, they're integrated, they have to be mindful. And they're the fastest growing sector by far. So I think that we will continue to see a movement but this way away from drudgery and I think Lord Keynes got it right a back in 1931 or '32 at the height of Depression. This great economist scribbled a little six-page letter to his grandchildren saying, "My hope is-- why do we have to remain where we are? Let the machines do this." And he's right. If we would've remained in serfdom and would have said well, there's nothing else we can do. There will be

serfs or there'll be slavery, we wouldn't be where we are now. And what I would say is this: If we get any of this right by mid-century 2050, I would think the grandchildren then look back at their grandparents the millennials and say well, what did your parents do for a living? Well, back around the late 1990s, 2000, your great-grandfather was driving a truck back and forth 10 kilometres a day, five days a week. And they would say, what?

Driving a truck? And great-great-grandmother, she was on an assembly line taking products off and putting them in plastic bags and putting them in boxes. They'll be as incredulous as we are when we hear about slavery and serfdom. That's if we get it right. So in terms of where we move, the more productive we are, the less we have to work as well. In *The End of Work*, I advocated a 6-hour day, 30-hour work week. We implemented that in France as you know and some other countries. When you have increased productivity, only then you have two options: reduce the work force or reduce the work week. The history of the labour movement's always been to reduce the work week. That was always more important than the pay. It was the leisure up until maybe 40 years ago. We have to reverse it. There is no reason why people can't, in an intelligent society, work well in six hours a day. In fact, when we do studies of people's maximum potential during a day-- when you reach your peak temperature, everyone is different, it's about four hours. Really. And then you have it. Some people are on a roll from 11:00 to 2:00, from 9:00 to 1:00 and that's it. So every hour we have people in there beyond that, we are losing their contribution, alright? So I think all of this can be done. We just have to think more intelligently and there's gonna be millions and millions and millions of jobs. We already have them across Europe and China. Even in the U.S., we have 3.5 million jobs already in solar, wind, efficiencies in buildings and we've just begun and that's five times the amount of jobs in the entire fossil fuel industry and all the related industries and we've just begun. So you can do the math.

SHAWNE McKEOWN: But do you have a sense-- and I know we can-- and it's-- we're facing a lot of problems to deal with quickly but for the people who are weathering the transition, say for instance, workers in the Tar Sands in Alberta?

JEREMY RIFKIN: Yeah.

SHAWNE McKEOWN: And workers in Oshawa who have were laid off last fall and for those people who may be worried that their next step in this new phase of this infrastructure will be precarious.

JEREMY RIFKIN: Yeah. I'm glad you raised that. The International Confederation of Trade Unions which represents 240 million people around the world call for just transitions and I'm totally for that. And that is the most disadvantaged communities-- first of all the communities that are in some part the fossil fuel industry, there has to be a just transition that's workable and that's viable and maintained over generations. In Germany, we waited too long. You know, Germany was the leader. I worked with the Chancellor and Sigmar Gabriel the Vice Chancellor. A third of our electricity now is renewable but we have a lot of coal too because there are two regions in Germany where they rely on coal. The German government just announced at the beginning of this year, I think it's €40 billion to completely help them on this transition. We know that solar

and wind jobs pay more per hour than most of the jobs in the fossil fuel industry. Coal workers get a lot of money because they die early. So, I mean, there's the sad cruelty of this is you give them $60,000 a year and then they have a 20-year life expectancy because of the coal dust. That's just criminal. Hauts-de-France is one of the regions that our global group has helped transition. They're the coal mining region and the industrial rust belt of France and Europe. It's the biggest region of France. It's still the industrial region. So part of that region-- we started there-- our global team with their team with thousands of people there six years ago in peer assemblies and we went right into the coal mining region-- or they did. And they took the grandchildren-- and the coal mining region, it's something out of the 19ᵗʰ century. You see the old coal buildings and the little bungalows and where everybody-- the local churches. A very forward-thinking mayor, Jean-François Caron. They set up a retraining centre for the grandchildren of coal miners because there were no longer doing coal miners; everyone's unemployed. They train these young people in nine months for solarizing and retrofitting and then they solarized and retrofitted the entire coal region now. And they all have jobs and it takes nine months to set them through and they're making a good living. This can be done anywhere. And they just put in their first hydrogen buses there in France in the coal mining region and they're using solar and wind generated, not fossil fuel generated energy. And they're moving 1,200 projects through there. They have high-tech parks finding biological alternatives to chemical products. They're doing new types of insulation in buildings. We put an entire envelope on within a day-- state of the art. This is all in one region. So is there something special in this region? No. They decided not to wait for their national government, not to wait for anyone else. We came in and helped them. They did a third industrial revolution architecture. They customized it with thousands of people involved; not stakeholder groups. Thousands. Not focus groups. That's all bull. And those peer assemblies are still there six years later and they keep rotating so every generation takes responsibility for a generational construction site. Therefore you move from pilots to scale. That's what's wrong. If you go across Canada, across the world, every mayor will tell you about the wonderful green projects they have. A LEEDS building or a hydrogen bus or a bike path. But all of that are pilots. To scale an entire region has to lay out this digital infrastructure bringing the communication together with the energy internet and the mobility internet to manage power and move everything all on top of an internet of things and then the community and not private industry has to be responsible for the infrastructure. Private businesses can build, they can help manage but all of these platforms should be controlled by your provinces and your cities with private businesses coming in and with ECSOs doing the energy savings and make it work. This should be going on right now in Canada. And we have to remember that Canada, the U.S. are outliers. They are number one in four of the fossil fuel producing powers in the world. U.S. one, I think Canada's four now.

RAY HARRIPAUL: So how can colleges and universities make the big shift and quickly to support social commons and collaborative commons economy?

JEREMY RIFKIN: Hauts-de-France is another good example. The 25 colleges and universities have come together with the trade schools and all the 250 high schools, they have a covenant. And that is to completely transform their infrastructures first. So they become the nucleus and

the training centre for the next generation. So the Catholic University of Lille is leading the covenant. They have solarized everything within six years. They've got all integrated internet of things across the building. They have a state-of-the-art computer centre where you can see what's happening with power and energy at any given moment and efficiencies. So all the students are learning from being in a third industrial revolution infrastructure which now is trying to move out toward the neighbourhoods and the communities. Secondly, the universities are in a compact to transform curriculum. So the curriculum is commensurate with the type of infrastructure we're developing. If you look at infrastructures over history, the way they're engineered tells us a lot about the kind of business opportunities and constraints and types of governing patterns and restraints. It's not iron-clad but, for example, the first and second industrial revolution infrastructures centralized communication; coal, oil, fossil fuels, nuclear, power, telegraph, telephone. All of that was very vertically integrated to get scaled and they were all proprietary and closed intellectual property and they're centralized. If you look at-- and that's, that's how the businesses were and that's how the government worked. If you look at a third industrial revolution infrastructure, its engineering design is quite different. It's designed-- and every digital native knows this-- to be distributed, not centralized. It works best if it's open and transparent with no closure with intellectual property because if its open, you have the network effect. The more the network, the more everyone benefits from each other's social capital. And it scales latterly, alright? So what this means is you need a form of governance that conforms with that. So in Hauts-de-France, they have peer assemblies where-- this has been going on for six years and thousands of people involved; not stakeholder and focus groups and 300 or so at any given time in the peer assemblies working on integrating all these projects in this construction site over 20 years that'll cross three different generations. So regardless of what government is in place, these peer assemblies work with each government and there's an esprit de corps fraternity, solidarity, the French Revolution across this region, they're doing it. And they created thousands of jobs in six years. This could be done in Ontario tomorrow morning. There's no secret to what's going on in France. We also are in 23 cities in Rotterdam to The Hauge. It's the petrochemical complex. And we're doing Luxembourg. It can be done anywhere. But it means rethinking our notion of governance and our notion of education that goes with a new form of governance and a new kind of economy. But in terms of curriculum, what Catholic University of Lille is doing is they've eliminated separate teaching. All teaching is now team taught, interdisciplinary. So that you learn multiple perspectives and can think complex thinking. What we've learned is the kind of school systems we've adopted during the "age of progress" were all isolated and different disciplines with different languages that didn't talk to each other and while it kept generation after generation from understanding deeply the complexities of life, everyone got isolated into little silos. And the result now is it frightens people when you know less and less. And you only know about a few things, alright? So what they've done is every course is team taught. So if you're teaching climate change and evolutionary transformations, you have to bring in an anthropologist, along with the biologists, along with sociologists. They also have module teaching. Student teaches each other. The faculty have to be overseeing it but the students have to be in teams and teach each other. In the old system that we've inherited for 200 years, if you share your knowledge with another student it's called cheating. You're expelled. In the new system, if you share your knowledge, that's the basis. Knowledge is not power. Francis Bacon got it wrong. Knowledge is our shared

sense of experiences about the narratives we live by as a collectivity. So they're encouraging team teaching. They have not eliminated grades yet but the next stage I hope would be certification. Your team gets certified or not certified, just like in technical skills. But then you'd have to change, you know, the whole system. And finally, their learning is clinical. They've taken service learning which we use in Canada, the U.S. and they've put it to pedagogy. Everything they learn in the classroom is actually applied and worked with, with all their neighbours in the surrounding communities and neighbourhoods. It's a virtual circle.

RAY HARRIPAUL: So us as institutions, what is our role in developing and helping foster resilience?

JEREMY RIFKIN: All of our curriculum is based on a set of assumptions that are attached to the narrative of the age of progress from the enlightenment. That's not our reality anymore. The age of progress, what we've ended up with, we thought we would perfect the human race and perfect the planet we live in and pacify it, domesticate it, reanimate it and transform ourselves into the perfect "being". We now know that that was not a success. I'm sorry. We're now in a sixth extinction event of life on Earth. And we may be seeing the mass extinction of life for the sixth time on this planet within the next century, all right? And a lifetime of people here. We have to move from the age of progress and of course all of our curricula is based on that framing reference. We have to move to the age of resilience. We have to understand our role is not to perfect but to adapt. We have to realize that we are not the sole proprietors of this planet and we do not have ultimate agency. The planet is rewilding and what the planet is saying to us is you never had ultimate agency. And that is all of our spheres and our circadian lunar and circannual rhythms and our lithosphere and biosphere and magnetosphere, our hydrosphere, the orbiting of the planet and how they all have agency. And we have to understand that the lesson of climate change for curriculum transformation is this. The cruel lesson we're learning here, but it's important one, is that climate change is teaching us that everything we do, each one of us, intimately affects the life of some other human, some other species or the operation of the various spheres on this Earth. That we are in multiple agencies of which we are a small part. If we can learn that lesson and begin to realize we're an endangered species and our fellow creatures are part of our evolutionary family and endangered species, we all are in this together, all of life on Earth and we have to begin to take our responsibility each of us for the 19 kilometres of biosphere we live in our communities. Ontario, 19 kilometres. Take care of Ontario. We have to begin to transform ourselves into an age of resilience. It's going to be tough. We're not going back to the good old days. We've had 10,000 years of a relatively mild climate. It's an anomaly in the 200,000 years we had. We are rewilding. We're gonna have to change our approach to science. It's going to have to be more pragmatic science, more adaptive. We're going to have to be more understanding of our notion of the commons. We're gonna have to live as communities and shared communities. We're gonna have to see our responsibility for each other or else we'll see more fear, more abandonment of our social contract and more people going it alone and scared to death. The answer to that is fraternity. It's coming together in community. The folks that first came over to Canada, the U.S., they did that. They were in a rewild and they had to live as communities. We're gonna have to live in a different type of community where we share that with the

community of our fellow creatures as well. Canadians have that in their DNA, so do Americans. We didn't have to re-find it. It's gonna happen through our curriculum and we gotta roll up our sleeves really, really quickly. Sometimes I come to these places and the next day, it's back to business as usual. Wasn't that energizing, interesting and entertaining? No. I smell that here at this university, the faculty's ready, the students are ready. Transform university, do a road map for the students and faculty and administration. Bring in your other universities across Ontario. Do it in one year across Ontario and start scaling up and we will have you partnered so you can see the other regions we're in and move it across the country.

RAY HARRIPAUL: Thank you so much for your time, Mr. Rifkin.

JEREMY RIFKIN: Thanks for your time too.

RAY HARRIPAUL: Thank you.

[music]

SHAWNE McKEOWN: That's a wrap on this episode of Work Shift. What did you think?

RAY HARRIPAUL: Want to share your thoughts on this episode?

SHAWNE McKEOWN: Email us at workshift@georgebrown.ca

RAY HARRIPAUL: And be sure to check back for our next episode when we talked to George Brown College's president, Anne Sado about the future of post-secondary education and how it will have to adapt to a rapidly changing economy and work force.

SHAWNE McKEOWN: This podcast is brought to you by the fine folks at George Brown College. We want to thank Jeremy Rifkin for sharing his thoughts with us today.

RAY HARRIPAUL: It's the end of your Work Shift. Check you later.