

JFAC S3 Ep 9

Keeping the Lights on: Just energy solutions for Africa

[00:00:00] **News Bulletin 1:** Eskom is currently implementing stage six power cuts overnight. Stage five load shedding will then coming to effect from five tomorrow morning to four in the afternoon. The productivity is attributed to the escalation in the intensity of load shedding to delays in bringing back some of it's units to service. Eskom has confirmed that the rotation will be repeated until further notice.

[00:00:32] **News Bulletin 2:** Not only does the just energy transition guarantee a better supply, but the move to renewables also means more jobs. Eskom's former head of just energy transition, Mandy Rambharos, says funding has been secured to repurpose Eskom's Komati coal fired power plant. She says there are plans to shut down over 20 gigawatts of plants within the next 13 years to [00:01:00] make room for 50 to 60 gigawatts in renewable energy.

[00:01:04] **News Bulletin 3:** The \$8.5 billion support announced last year is facing its first test in progress check. With COP 27 kicking off, we reflect on Hillary's article titled What the \$8.5 billion Package will look like and how will it be spent. Hillary Joffe of Business Day joins us now for more.

Hillary Joffe: Now I think there are huge estimates for what, uh, developing countries will need in the way of help from advanced economies to transition, and especially to transition in a way that doesn't destroy affected communities or affected workers. [00:01:36] That's, uh, but so the \$8.5 billion which was offered by the five partners last year is a fraction of what developing countries need, of what we need, but it is being held up as a model for other similarly coal dependent developing countries to follow.

[00:01:57] **Ntombini Marrengane:** The issue of energy in South Africa is a thorny one. As this episode is being recorded we are back in the higher stages of load shedding and the frustration levels felt by everyone are at an all-time high. 2023 has seen a rise in load shedding, with News24 reporting in early February that South Africa had reached 100 consecutive days of rolling blackouts - and as you know, that has not let up.

[00:02:23] **Ntombini Marrengane:** The reality though, is that even if load shedding were not an issue, a large number of people would still not have access to electricity. According to a World Bank report issued in 2020, about 84% of the country had access to electricity, effectively leaving over 10 million South Africans with no access to power.

[00:02:44] **Ntombini Marrengane:** Welcome, I am Ntombini Marrengane, host of season three of the Just for a Change podcast. If you've been following this series, you'll know that I have conversations with change-makers, from South Africa and further afield. In this episode, we're going to be unpacking some of the complexities surrounding the green economy, just energy transition, and urban African energy issues.

[00:03:08] **Ntombini Marrengane:** While Africa remains the least electrified continent with an estimated 600 million people without access to electricity - the shift in global politics, the war in Ukraine, and a post-pandemic economy, amongst other things, have led to an energy crisis worldwide. An article published by the International Energy Agency speaks to some of the issues that led to this current energy crisis.

[00:03:32] **Ntombini Marrengane:** It reported that "Energy prices have been rising since 2021 because of the rapid economic recovery, weather conditions in various parts of the world, maintenance work that the pandemic had delayed, and earlier decisions by oil and gas companies and exporting countries to reduce investments." Amidst all of this, the need for a continued and more urgent energy transition is clear.

[00:03:58] **Ntombini Marrengane:** In 2022 an 8.5 billion dollar investment package was approved by the South African government to help move the country away from such a heavy reliance on fossil fuels and towards cleaner energy sources. In episode 5 of this season, I spoke with Dr. Mao Amis of the African Centre for Green Economy. Our conversation centered around tackling climate change in Africa and the importance of working towards just transition - especially given the fact that the worst impacts of climate change are felt by people and countries who contributed to climate change the least.

[00:04:34] **Ntombini Marrengane:** In a context where countries which are not principle polluters are the ones that are finding themselves having to pay the excesses of more developed nations. Isn't that a bit unfair? And do you think that climate change means justice means the same thing in the developed and the developing world?

[00:04:53] **Dr Mao Amis:** Obviously it's unfair. During, I think there was COP 15 in Paris, [00:05:00] there was a principle that has been agreed about collective, but

differentiated responsibility and, and all that means is that we are in this together. There's only one earth, there's only one climate system. So even though we are not responsible for this impact of climate change in terms of developing countries, we developing countries will be impacted. So how can everyone respond?

[00:05:24] **Ntombini Marrengane:** Today we're going to be expanding on this conversation and hopefully get some deeper insight into the extremely complex issue of going green, while making sure the most vulnerable members of society don't get left behind. My guest today is Professor Josephine Musango, a resource economist and systems dynamacist.

[00:05:42] **Ntombini Marrengane:** Josephine is a professor at the UCT Graduate School of Business and her research interest entails using a systems approach in managing change and policy-related challenges in the energy transition, the green economy, and urban African energy issues. She has authored and co-authored over 70 articles on these topics and holds a Doctorate in Public Management and Development where she focused on technology assessment of renewable energy sustainability in South Africa.

[00:06:16] **Ntombini Marrengane:** Welcome, Josephine. Thank you so much for joining me for this episode. It's a real privilege to have you share your story with us. Tell me a little bit more about how you ended up working in the sector. Were you always interested in energy issues?

[00:06:30] **Prof. Josephine Musango:** Uh, thank you so much Ntombini for having me. Uh, I am trained as a resource economist and this equipped me to use economic theories and methods, uh, to manage resource problems.

[00:06:45] **Prof. Josephine Musango:** And I also use system dynamics, which is a method for understanding difficult problems that change over time in order to guide decision makers and manage these problems, uh, [00:07:00] sustainably. So, Ntombini with that background, I was inspired, uh, to work in the energy sector in 2008, and this is the period I was involved in a project.

[00:07:14] **Prof. Josephine Musango:** To assess the sustainability of, uh, energy development in the Eastern Cape Province. And just to, uh, explain to the listeners, uh, bioenergy is a renewable energy that is produced from biomass, and that is particularly plants. It could be soybean, you can think of plants that can be used to produce, uh, energy that is, uh, for use in either vehicles like biodiesel and so forth.

[00:07:43] **Prof. Josephine Musango:** So in this project, our, we were involved in managing various resources or assessing the various resources such as land, uh, where the crops are going to be planted and what type of plants are going to be

planted, [00:08:00] uh, things like water, uh, what, uh, amount of water that will be required to produce the bioenergy.

[00:08:07] **Prof. Josephine Musango:** Also energy that is required to produce that bioenergy is another resource that we were looking at. Waste that is produced from the production of the bioenergy. Other resources included human resource, like what skills will be required, uh, are there available capacity, uh, to really develop their renewable, their bioenergy, and other resources included financial resource.

[00:08:35] **Prof. Josephine Musango:** Where would we get the money to invest? Who would be investing? Who are the, uh, industry partners that would be investing in the renewable energy? Uh, so Ntombini, in this particular project, I learned that energy is dependent on technology innovation, but it also affects the economy, it affects the society and the environment.

[00:08:59] **Prof. Josephine Musango:** So for [00:09:00] us to manage any energy development, We need to have collaboration with many stakeholders. Uh, this could be technology developers, it could be government, uh, industry, academics from different backgrounds, and also the communities that are affected by this, uh, development. So ever since that particular project, I have focused my studies to understand these energy related issues, uh, particularly energy transitions, green economy and urban Africa energy issues.

[00:09:31] **Ntombini Marrengane:** The energy issues we're facing right now in South Africa are dire. Given the complex nature of our energy needs, the insufficient infrastructure and inadequate policy responses, what part of the energy story in South Africa should our listeners care most about?

[00:09:46] **Prof. Josephine Musango:** We do have many pressing issues in South Africa at the moment, but I would like to summarize this into three root problems.

[00:09:55] **Prof. Josephine Musango:** Uh, the first one is energy security. Energy security here [00:10:00] is the ability to meet our energy needs, uh, when there is enough supply capacity to meet that need. But at the moment, South Africa, we are currently energy insecure. We don't have enough supply to meet our energy demand, and that is why we are having load shedding being implemented to manage that, uh, energy demand supply mismatch.

[00:10:24] **Prof. Josephine Musango:** But load shedding is not the best effective way of managing this mis mismatch. So we need fundamental solutions to deal with this energy security issue. The second thing is about energy access and what I mean by energy access is that not all South Africa's population has access to energy and in

this particular case, electricity and we even facing a bigger challenge because energy access is not just about connecting to the grid.

[00:10:54] **Prof. Josephine Musango:** It's the ability to afford [00:11:00] the energy, ability to have it when we need it, ability to fulfill the energy services we need. Can anyone cook when they wanna cook? Can anyone run their businesses when they wanna run it? So energy access here is ever becoming a bigger challenge for South Africa.

[00:11:17] **Prof. Josephine Musango:** So the low income population, uh, even the most affected, uh, population currently because majority have, uh, no access to, uh, energy and all clean energy fuels. And then the third fundamental issue, uh, that South Africa is facing is the environmental sustainability. Uh, South Africa is currently the largest greenhouse gas emitter in the world, and this is because the country relies on coal for in the energy sector.

[00:11:49] **Prof. Josephine Musango:** And just to give an example, uh, 85% of electricity generation is currently from coal and the South African [00:12:00] government has committed to, uh, moving to just energy transition, which is shifting away from coal, electricity generation to, uh, using cleaner energy, uh, technologies or energy sources. Uh, but this movement from coal to other sources will require that the country or the government does not worsen the socioeconomic challenges, uh, we are currently faced, and this includes poverty, inequality, and unemployment.

[00:12:32] **Ntombini Marrengane:** Thank you for explaining that. It really puts into perspective the different parts of this sort of energy crisis that we're all experiencing. Um, for those of us who live in South Africa. How did we get here?

[00:12:46] **Prof. Josephine Musango:** I just want to share this in two points. Uh, the first one is the lack of investment in capacity. So over a very long time, um, the, the South African, um, Uh, the [00:13:00] country is South Africa. We haven't invested in the energy capacity, or supply capacity, uh, and the planning hasn't considered the time delays that are required to invest in capacity.

[00:13:11] **Prof. Josephine Musango:** So, for example, it takes almost 10 years to develop nuclear technology. It takes almost 8 to 10 years to also, uh, uh, develop coal capacity. So, which means if we want to bring a capacity into place, we need to have those long time delay's. Of course, renewable energy takes about two years, three years, but due to social, uh, uh, political backlash, Some of those delays have taken into account, so there has been lack of investment and lack of taking those delays in the climate. And then the second aspect is about increased demand.

[00:13:55] **Prof. Josephine Musango:** Between 1996, uh, to 2020, uh, electricity access in [00:14:00] South Africa increased from 7% to 85%. And I would say that this is actually an exceptional progress that South Africa has achieved. Uh, this was through electrification programs and other policy programs to ensure that we improve energy access, but, This, uh, massive, uh, electricity access did not, um, correspond, uh, with investment in the capacity.

[00:14:30] **Prof. Josephine Musango:** So you can see that we're increasing the demand, the, the demand, but we didn't, uh, work on this supply side. We also see urbanization also took place in South Africa at the same time. So majority of population living in urban areas and there are new demands about, uh, energy demands. So you move to the urban areas, you want to have a tv, you want to buy, new devices that use energy, so that increases the [00:15:00] energy demand.

[00:15:01] **Prof. Josephine Musango:** Uh, so currently in South Africa about, um, 88% of the population live in urban areas. And, uh, that is nearly about, um, 40 million people in South Africa live in urban areas, and of those 40 million people, about 10 million people live in the informal settlements. So, uh, the World Bank data has, uh, shows that between 1996 to 2010, South Africa decreased the number of people living in the informal settlements.

[00:15:36] **Prof. Josephine Musango:** But after that, those levels of informal settlement population has been increasing and currently they are at, um, higher levels than the 1996 levels. So it's a challenge, uh, in terms of how we deliver energy services, particularly given the urbanization aspects we are seeing in Africa and particularly also in South Africa.

[00:15:58] **Ntombini Marrengane:** That's, that's really [00:16:00] fascinating. What do you think accounts for this blind spot when it comes to planning and thinking ahead for the country's energy needs? I mean, clearly the technical aspects that you've already explained to us, that you need 10 years to build nuclear power and a lead time of eight to 10 years to to, to create coal fired capacity. Those are known factors. So what accounts for this lack of planning and this lack of foresight?

[00:16:29] **Prof. Josephine Musango:** There are quite a lot of studies that have, um, indicated the need for building the capacity. As I mentioned earlier, some of the delays were due to political backlash in terms of, uh, the investment.

[00:16:46] **Prof. Josephine Musango:** And I also think that the demand said, um, Understanding of the demand side aspect of, uh, energy needs is very, it's not well known. So there are very few studies [00:17:00] that have done the demand side of management, eh, to understand, uh, those aspects. But again, uh, the energy issue is systemic and it needs to take into account of various stakeholders involved

because there are a lot of, um, stakeholders are involved from, uh, government, from industry, uh, from the community members, that requires a coordinated effort to ensure that we can develop, uh, the, the capacity needs

[00:17:34] **Ntombini Marrengane:** If the government was so successful in rapidly increasing the level of access to electricity going from under 20% to over 80%, where does the political backlash fit in? Was it expectations were unfulfilled because we thought we'd be at 100%, or people didn't understand that with this extended [00:18:00] infrastructure and extended services, there was going to be a capital commitment that needed to be made and fulfilled by taxpayers. What, what, what is the missing piece there?

[00:18:13] **Prof. Josephine Musango:** In terms of the lack of capacity investment. I can say there's a lot of studies there that have already highlighted the need for, uh, for, for building new capacity. So, that research is not, it's, it's not that it's hidden, it's there. I think there was the perception that we have enough capacity.

[00:18:35] **Prof. Josephine Musango:** And, uh, of course, um, uh, the, uh, in terms of political backlashes, given the fact that South Africa relies a lot on coal for, uh, for, for electricity generation. So we have the energy, uh, mineral, um, uh, mineral energy complex, uh, where we've got vested interests involved. And, uh, These are some of [00:19:00] the aspects that are delayed in, in the processes of, uh, investing in the capacity.

[00:19:08] **Prof. Josephine Musango:** And I think also from Eskom, they've, they've, they've already indicated since 2007 on the need for, uh, investing in new capacity. Uh, I, I would say this is not something that is, um, is not available. It's that the lack of planning and taking these long time delays.

[00:19:31] **Ntombini Marrengane:** Given our patterns of poor planning and delays in implementation, how do you see South African cities and even African cities moving towards green energy and how do we move from really well articulated policies to practical action on the ground?

[00:19:49] **Prof. Josephine Musango:** Yeah. So, uh, thank you so much. Uh, in terms of, uh, energy markets in Africa, they're actually evolving and it is an opportunity for, uh, municipalities, [00:20:00] uh, to consider, uh, perhaps their business models, uh, in their planning processes.

[00:20:06] **Prof. Josephine Musango:** But what I'd like to point is that generally energy policy in many African cities is treated as an adhoc and it's not taken as a core mandate. So you'll find that energy is, uh, considered after maybe building a house

but the crisis that we are facing in Africa, they are an opportunity for African cities to consider integrating Urban Energy planning as a core mandate.

[00:20:35] **Prof. Josephine Musango:** So, uh, we've seen in the, in one of the recent documents from the World Economic Forum, uh, where, um, they highlight some of the cities in Africa that are leading the way, uh, to, in a green future. So, for example, uh, Cape Town has got an, a [00:21:00] dedicated energy and climate unit.

[00:21:02] **Prof. Josephine Musango:** And, uh, the, the city is also looking at preparing some of the ways of dealing with, uh, energy crisis because transport is one of their, uh, main, uh, energy use. Um, uh, uh, in the end users. Uh, they're preparing on ways to use electric vehicles powered with renewable energy. Other cities include Cocody in Ivory Coast.

[00:21:25] **Prof. Josephine Musango:** Which has got a Green city plan, uh, to cut emissions. We also have, uh, cities like Dakar in Senegal. Uh, that is committed to produce, uh, uh, renewable energy from, uh, energy, from renewable energy, uh, by 2035. Kampala in Uganda. Uh, uh, which also has got an energy and climate change action plan. And we also have, uh, Tsévié in Togo, uh, which has got a plan on sustainable biomass, and it's also [00:22:00] deploying rooftop, uh, solar PV's and electric vehicles.

[00:22:04] **Prof. Josephine Musango:** But coming back to South Africa, I would say that a government has paved way for embedded generation, um, and municipalities have the opportunity to move towards green energy, uh, uh, with this particular, uh, um, policy, um, implementation. But we find that very few municipalities are in the position to implement it due to maybe lack of capacity in terms of resources, uh, financial resources as well as skills, resources but I would, it's an opportunity, uh, to move towards a green economy.

[00:22:43] **Ntombini Marrengane:** You've just given us some very interesting examples of cities around the continent, um, that are using or looking at alternative sources of power. Could you perhaps give us more specific ideas on what other sources of power could and should be [00:23:00] considered in South Africa and on the continent in general?

[00:23:02] **Prof. Josephine Musango:** Well, that's a very big question Ntombini because, you know renewable energy sources depends on. Uh, how, what, what resources each particular country has. So for example, we know that South Africa is well indored with coal. That's why the, the country has been using coal for a long time. But we also indored with renewable energy.

[00:23:28] **Prof. Josephine Musango:** And this includes solar. It also includes wind, it also includes geoamo, uh, uh, uh, technologies. Technologies and uh, and these are some of the resources that we can, we can tap on. And, uh, for example, I would say Kenya has moved from having 26% of its, uh, population having access to electricity to now almost [00:24:00] 76% of its population having electricity because they now use, uh, previously the country was relying on.

[00:24:09] **Prof. Josephine Musango:** But because of erratic rainfall, um, the, the, the, the supply was, um, was, was not, uh, enough. Uh, gas, of course, gas is, it's, it's not, uh, it's seen as a conventional energy, but it can be seen as a convention or as a transitional energy as we attempt to, uh, move to more renewable energy, but I would say that there would be more of a mix of energy, um, sources that we need to use, but moving towards reduction of, um, resources or sources that generate, uh, uh, more, um, uh, CO2 emissions.

[00:24:51] **Ntombini Marrengane:** Zeroing in on low income households. What do you think is the impact of the energy crisis on lower income household?

[00:24:58] **Prof. Josephine Musango:** Low [00:25:00] income households are more likely to be the most vulnerable in various ways. Uh, firstly, I think, uh, the households are more likely to remain in poverty, uh, because it affects their local businesses. It affects the, industry in which their households are maybe employed as well as affecting the economy in which they're involved in.

[00:25:23] **Prof. Josephine Musango:** Uh, it is also likely to was send the ability of the low income households to meet their energy services, so like, now we are having load shedding. The households are more likely not to cook when they need to cook, open their businesses when they want to open their businesses. And remember, I visited one informal settlements recently and the local businesses around there, they were shut down because there was no electricity.

[00:25:56] **Prof. Josephine Musango:** And this was, uh, not just because of load shedding because they're [00:26:00] even more affected than the normal load shedding that we are having. They have power cuts, for example, if it rains. Uh, so they're more, they're even more affected. Then the low income are also likely to engage in dangerous activities to meet their energy needs, uh, which includes, uh, continued reliance on dangerous fuels such as parafin, candles, uh, some even sawdust, waste, to meet their energy services such as a warming themselves during, uh, during winter.

[00:26:37] **Prof. Josephine Musango:** I remember in one community where, uh, they showed a particular waste they use, which generates, uh, a particular smoke that was, um, uh, linked to health related issues in the community. Um, energy crisis are

also likely to affect other aspects of households, as I mentioned here. Uh, things related to access to clean water when [00:27:00] the water is supposed to be pumped cause, uh, of electricity or the, the water is not able to be re uh, to be purified.

[00:27:08] **Prof. Josephine Musango:** So, which means, uh, uh, water that is applied is, not in good condition for use at the household level. Uh, issues about safety at night and health related issues, which I mentioned earlier because of using unclean fuels. Uh, so what I can uh, point out generally is that, uh, the crisis is likely to worsen the socioeconomic wellbeing of the low income households and possibly widen the inequality gap, which is a challenge in South Africa.

[00:27:44] **Ntombini Marrengane:** Thank you, Josephine. You've given us some really clear examples of how the energy crisis is actually further penalizing people who are already living in the margin. What role do you see innovation playing in moving towards a more just energy [00:28:00] transition?

[00:28:00] **Prof. Josephine Musango:** So I see, uh, innovation firstly needs to encompass activities and services that are motivated in meeting social needs. That, uh, means that we need to go beyond a one size fits all solution. So ways in which maybe the innovation can play just transitions would be, uh, having innovations that expands energy sources, either grid or of grids, um, that relies on renewables and alternative solutions.

[00:28:35] **Prof. Josephine Musango:** While also ensuring that they create jobs, they improve energy security and they also decarbonize the energy sector. The second way is innovations that, uh, provides business models that encompass the unfulfilled energy services. What I mean, unfulfilled energy services is a.[00:29:00]

[00:29:15] **Prof. Josephine Musango:** Uh, but I can't. So that is an unfulfilled energy service. So we need business models that can provide, um, uh, the solutions to provide for energy service that we need to fulfill and this needs to be context specific, and this means that solutions implemented in low income households require co-designing solutions with the communities because you can design a technology to provide service, but it doesn't suit the low income households.

[00:29:47] **Prof. Josephine Musango:** And those solutions need to be affordable. They need to be also modern. And they need also to be able to last longer, meaning that there are sustainable solutions. [00:30:00] And another way is also innovating energy devices that are suitable to fulfill those energy services and they're adaptable to the context.

[00:30:09] **Prof. Josephine Musango:** And I'll say collaboration is very important, collaborating the different stakeholders because that helps you to have a diverse perspective on developing the technology or developing the solutions rather than somebody making a solution in overseas and dropping it in an informal settlement in Africa.

[00:30:36] **Ntombini Marrengane:** Are you able to share any examples of innovative initiatives or projects that you're aware of on the continent that have been able to move the needle just a little bit towards a more secure energy?

[00:30:48] **Prof. Josephine Musango:** I can say that some projects that have been, uh, working towards this particular area. Uh, one is a project I was involved, uh, [00:31:00] co-designing energy solutions with urban households, in the informal settlements in South Africa, Kenya, and Uganda. Uh, what was quite interesting is that we co-design with.

[00:31:11] **Prof. Josephine Musango:** Informal settlement population, and we learned the majority of households in those, uh, three case studies, uh, were female-headed households and some of the households, they, uh, were able to shift from using unclean fuel sources, uh, such as paraffin and charcoal, uh, to using gas. And they also learned that they were spending more money on charcoal and paraffin compared to using gas.

[00:31:41] **Prof. Josephine Musango:** But I also wanna say, uh, point out some, uh, innovative solutions that are ongoing and particularly in South Africa, we have Pay gas, uh, which is providing, uh, solutions to, in the informal settlements. We have Zonke energy, uh, that is delivering, uh, also energy [00:32:00] solutions to, uh, informal settlements and also iShack project, which is a social enterprise offering of solar solutions in the informal settlements.

[00:32:10] **Prof. Josephine Musango:** I know in Kenya, the Kenyan government has managed to move most households from charcoal to gas because they came up with different technologies like 1L gas cylinder, 3L, gas cylinder, 5L. So, which means that different households can buy depending on affordability.

[00:32:34] **Prof. Josephine Musango:** Uh, Mozambique is also another country that has been looking on, uh, shifting, uh, gas, uh, shifting the houses from, uh, biomass to gas because Mozambique has got, uh, gas resources

[00:32:48] **Ntombini Marrengane:** From a systems point of view, what are some of the leverage points that you think need to be better understood and utilized to bring about sustainable approach to energy security, [00:33:00] particularly in South Africa?

[00:33:01] **Prof. Josephine Musango:** Some of the things that come, uh, uh, uh, based on some of my initial work in this area, uh, is investment in energy supply because without investment we cannot expect any improvement in supply. So, that would require investment in renewable energy supply or off-grid solutions.

[00:33:22] **Prof. Josephine Musango:** And also ensuring that the planning that, uh, take into account of delays of investments because we can have all these different solutions, like let's change the person in charge of the energy sector, let's say change this. But without investment, no matter what you do, nothing is going to happen. We're not increasing supply by doing that.

[00:33:45] **Prof. Josephine Musango:** So the second aspect is about a private sector investment in social innovation, which I think it's a, it's a leverage point to help address, uh, the fulfillment of energy services, particularly in the low income, uh, households. Uh, [00:34:00] that aspect is, uh, about the government creating conducive environment, uh, that would allow, um, collaborative efforts with diverse stakeholders.

[00:34:11] **Prof. Josephine Musango:** Of course, uh, it's been on the news, uh, that there are a lot of social political backlash on this in terms of, uh, uh, providing, uh, or expanding the supply of energy. So government can play a key role on that. Another aspect is about demand site management, which is, uh, through education and awareness, uh, to help end users and hand users.

[00:34:36] **Prof. Josephine Musango:** Here it's across households, uh, businesses, industry, all those people who use energy in their consumption on how to reduce their consumption, how to improve energy efficiency through using, um, uh, products that, uh, use less energy, uh, as well as, uh, to consider investing in off grid solutions if they can.[00:35:00]

[00:35:00] **Prof. Josephine Musango:** And then, uh, finally it's about skills development in the new and alternative energy because we need to, to develop the skills, we need also to educate, uh, uh, people about the critical role, uh, to the energy transitions so that people would not be asking why, uh oh, people wouldn't be still waiting for electricity from the grid but they can look at, uh, uh, understand why these challenges are happening and how they can actually be part of the solution.

[00:35:30] **Ntombini Marrengane:** To that point, do you have any thoughts on what the average South African can do to play their role in the green economy and the just energy transition?

[00:35:39] **Prof. Josephine Musango:** It's a question that, uh, but I've been asking what can I do daily to be part of the solution rather than the problem? So I, I don't

think that the household, eh, can completely move away from the grid at the moment, but I think there are small steps that we can consider towards that process of, [00:36:00] contributing to being part of the solution rather than a problem.

[00:36:04] **Prof. Josephine Musango:** And, uh, I think, uh, one of them is about, uh, uh, looking on whether you can, we can invest in alternative renewable energy, uh, particularly devices that rely less on the grid, electricity. Um, also looking at, uh, investing completely on off grid solutions. Uh, and know there's some, uh, industry that, businesses that are already moving off grid, but.

[00:36:30] **Prof. Josephine Musango:** These are mainly, um, uh, or houses are moving off grid, uh, or hybrid solutions. But these are mainly a high income households who are able to shield themselves from, uh, the interruption on, uh, the, the energy crisis. But we see the low income households are not capable to do that. But then another aspect of, uh, we can deal with the energy crisis is investing on, uh, other alternative, uh, uh, fuels [00:37:00].

[00:37:00] **Prof. Josephine Musango:** Uh, for example, gass for cooking, uh, or solar energy solutions, devices like water heating, solar water heating, uh, solar lights. Uh, I know, uh, some businesses or some households have invested in fuel powered generators. Of course, this, this is, uh, not like the final solution, but it's a solution to help in meeting their services.

[00:37:27] **Prof. Josephine Musango:** But like fuel power generators are still using, uh, diesel, which is a conventional energy that's generating, uh, CO2 emissions. But this is some of the transitional, uh, ways, uh, of, of contributing to the crisis. But looking at, a more longer perspective of shifting to, uh, hybrid O of these solutions

[00:37:55] **Ntombini Marrengane:** Josephine, this is a big problem as we've been discussing [00:38:00] throughout our conversation. What keeps you hopeful and inspired in this work?

[00:38:07] **Prof. Josephine Musango:** Ah Ntombini, I'm, I'm very hopeful and inspired cause I know each day is a new day to make a difference, one step at a time.

[00:38:14] **Ntombini Marrengane:** Thank you Josephine, for sharing your story with us. I'm so grateful that there are people like you who have devoted their lives and their intellect to this kind of work in research.

[00:38:24] **Prof. Josephine Musango:** Thank you Ntombini for having me and I also thank all the listeners.

[00:38:31] **Ntombini Marrengane:** As this season continues and we hear the stories of different change-makers I am fascinated by the fact that change-makers and change-making take on many shapes and sizes. We've heard from change-makers on the ground and we've heard from researchers and everything in between.

[00:38:47] **Ntombini Marrengane:** Every single person contributes to making small, incremental shifts that will hopefully make the world of difference. As I said at the beginning of this episode, energy is a contentious issue in South Africa and it's something that we're so aware of because we experience the inconveniences of blackouts every day.

[00:39:06] **Ntombini Marrengane:** Let this remind us of why renewable energy and the just energy transition are so crucial to creating a sustainable future... - one that benefits everyone. And that brings us to the end of another episode. Thank you for tuning in to season 3 of the Just for a Change podcast, powered by the Bertha Centre for Social Innovation and Entrepreneurship.

[00:39:29] **Ntombini Marrengane:** If you're interested in hearing more conversations with change-makers, then make sure you subscribe to this podcast so that you don't miss any of our upcoming episodes! If you've enjoyed this content, I'd also like to invite you to rate and review it wherever you listen to your podcasts and feel free to share it with your friends, family, and colleagues. Let's stay inspired and keep changing the way we're changing the world.