



Professor Deborah Andrews, London South Bank University

A Circular Economy for the Data Center Industry

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41 articles

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Lets Talk Tech is giving visibility to a notable woman in STEM integrating environmental sustainability to innovation in design and engineering. I interviewed Professor Deborah Andrews, Design for Sustainability and Circularity, School of Engineering, London South Bank University.

Professor Andrews supports the data center industry since 2010, an industry that emits the same amount of carbon as the airline industry, to transition to an environmentally sustainable model.

Building life cycle sustainability not just energy efficiency

With a background in product design, industrial design and interest in environmental issues trying to improve the footprint of products services and systems, Professor Andrews became involved in building the life cycle sustainability assessment of data centers to identify problem areas because

the industry is still focused on operational energy efficiency and that's not enough.

Data centers, large contributor to WEEE

The industry expanded exponentially and will continue to do so with computing in relation to AI.

We need to think about materials and embodied impacts of equipment designed in a linear fashion

whereby we take materials, make stuff, use it and we don't think about what will happen at the end of life which is a problem with electrical and electronic products. Waste electrical and electronic equipment (WEEE) is the fastest growing waste stream in the world. The data center industry is contributing to that. We have become addicted to the use of digital technology which the data center industry supports. We need to think about the embodied products impact.



Professor Deborah Andrews showing Lina Tayara the CEDaCI logo made with circuit board

Professor Andrews is the leader of Circular Economy for the Data Centre Industry project (CEDaCI) kickstarting the circular economy for the data center industry whereby we think at the design stage what will happen to the product, how can we change the design to be easily disassembled, components can be separated to increase recycling rate and increase product life. A lot of equipment is taken out of service when it still functions well. How can we improve recycling and reclamation of materials at end of life.

AI increases the need for circular equipment

In order to accommodate the compute required for AI, the sector will have to treble by 2030. AI hence increases the need to design more circular equipment that can be disassembled and reused.

Academic research to help the industry's environmental footprint

There is a gap between academia and the industry. We need to help the industry face the scale of the problem and to present empirical evidence to show how a change in business practice can improve companies profiles. Some of the challenges is that

companies are focusing on carbon reduction mainly in relation to operational energy but there are still no tools to show the embodied impact of products associated with the sector.

Through the CEDaCI project, Professor Andrews collected primary source data and built a tool to help stakeholders make informed decisions about equipment they buy, what to do when equipment appears to be reaching industry's perception end of life.

"We are academics offering the industry services they wouldn't have access to. We started talking to representatives across 14 of the industry subsectors who have phenomenal expertise but work in silos and who don't speak with others in other subsectors doing the best they can each in his sphere but without understanding the impact of the industry. We ran guided talking co creation workshops to understand what tools the industry wanted, what answers they want the tools to provide based on robust data sets."

The challenge of stakeholder buy-in to circularity

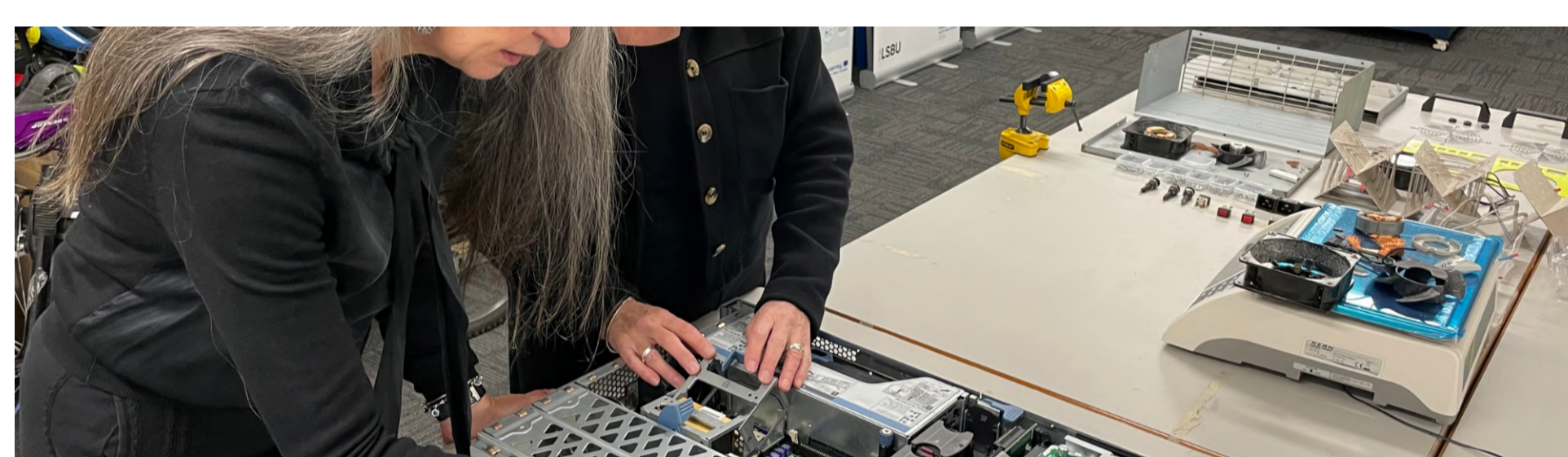
"From our experience working with representatives of the sector, they fall in 2 camps. People who are open to learning about changes and those who reject the idea without really understanding whats going on."

The challenge of adequate WEEE recycling infrastructure

"Behaviour is part of the challenge but also having an adequate infrastructure to take equipment and recycle it properly is another challenge. Its easy for industry to tick CSR boxes and conform to legislation. But recycling companies are not doing enough. The main material that is being recycled is anything with iron in it, steel based material, copper, aluminium and gold."

Critical materials for data centers

"There are 12 critical materials in circuit boards which if we don't have those we don't have data centers or any digital communication. They are critical because of the amount left in earth that is not yet mined, less then 1% recycling rate, the location where the reserves are found in geopolitically sensitive areas. These materials of high technical and economic significance are wasted, dumped in landfill. There isn't incentive to build adequate recycling facilities to process all the equipment that is ready for recycling."



Mining raw materials or metals efficiency

Policy for second product life market is developing in Europe and a non profit called Free ICT Europe campaigning and pushing for support of this environmental market. This drive can save purchasers money but also a significant environmental benefit, keeping materials in use longer rather than mining new materials.

Circularity requires legislation and investment

Energy efficiency was driven by legislation. There hasn't been any related to physical resource efficiency.

There is a massive investment opportunity for data center companies to think more holistically not just about building and running sites but also about investing in recycling capabilities.

"Localised recycling means less material will get contaminated and purer when they get into recycling hence easier to use to manufacture new products. The great thing about metals is it is a stable material that can be recycled ad infinitum. Plastic is a different category. When recycled it uses inherent properties and can only be used for lower grade product. Metal has the highest environmental impact of all the used for center equipment. More realistic thinking is required to make a whole product life. The risk of building recycling plants is pretty low because the demand for the material is going to increase."

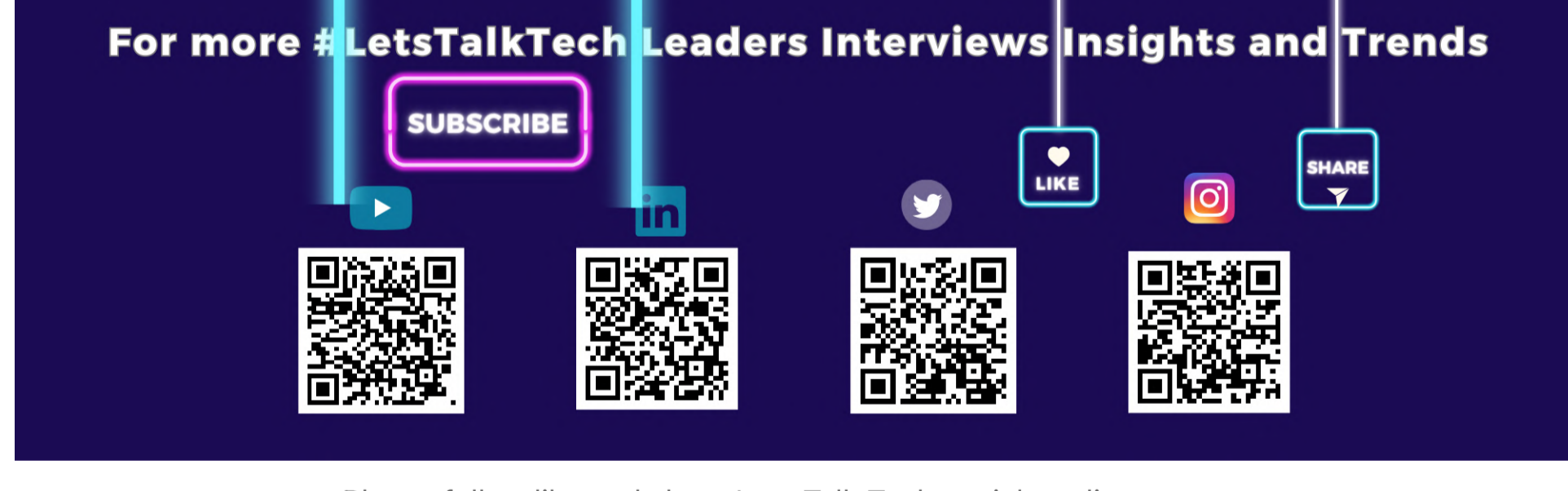
I asked whether sustainability pledges are sustainable in 2024

Its time to quote Greta Thunberg and say no more bla bla bla lets have some doing doing doing.

"There are trail blazers showing by example. Some organisations engage in sustainability because they are philanthropic and want to do good, others do it because they have to conform to legislation."

Please watch the interview [here](#).

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In this Lets Talk Tech video interview, [Deborah Andrews London South Bank University](#) and CEDaCI project leader speaks with us on a sustainable data center industry model, beyond energy efficiency, that adopts circularity. Considering the industry's exponential expansion and the embodied footprint of equipment, Professor Andrews argues that a data center circular economy model yields a considerable positive environmental impact as well as improve the industry's profile. We cover, amongst others, critical materials mined and wasted, the challenges and opportunities of recycling metals. The full interview is [here https://lnkd.in/g/aiVEXYh](https://lnkd.in/g/aiVEXYh).

#datacenter #circulareconomy #weee #recycling #mining #metals #interview #womenintech #environmentalsustainability #productdesign #academia #academicresearch #embodiedcarbon #csr #steel #copper #aluminium #gold #waste #landfill

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Stella Matutina Karangwa · 1st
Digital Infrastructure Consultant & Board Member, #Datacenter, #AfricaTech, #Innovation
4mo (edited) ...
#sustainability and #stem and really love that this is available on Instagram where I found the interview this morning Lina! I mean... If we want other (my) generations in our industry 😊, we've got to get the info 🙌

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4mo ...
Thank you Stella 🙌 spot on 🙌

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