Elevate Industrial Product design through Sustainable Engineering

Sustainable Engineering Podcast Series

Transcript

Sukanya Dey
Hello everyone! And welcome to HCLTech trends and insights podcast. Today we move on to the next episode of a series on sustainable engineering. The focus of this episode is on how we can elevate industrial product design to sustainable engineering. I'm Sukanya Dey, Senior Business Marketing Executive at HCLTech and I'm delighted to be joined by James Trebilco, Senior sustainability consultant at HCLTech and Vijayanand Gejji, Practice head, Sustainable Engineering and Cost Management COEs at HCLTech. Thank you for joining us, James and Vijay. Thanks.

Vijayanand Gejji
Happy to be here. I'm excited to share my learnings and insights today. Thank you.

James Trebilco
Yeah, pleasure to be here. Sukanya.

Sukanya Dey
Thank you once again for joining us. Let's begin the discussion by setting some context. Today, we witnessed the escalating impacts of climate change and we know that achieving net zero emissions appears to be our best defense. This, however, requires a profound economic and industrial shift driven by technology, markets, policy incentives for decarbonization. Sustainable engineering has been focused on as a key lever to drive the industry towards its net zero targets and bringing about new ways that the industry should be operating. So James, if I may begin with you, could you shed light on what precisely constitutes of sustainable engineering and how can we perceive it as not only a catalyst for change in traditional industries, but also as an emerging industry of its own?

James Trebilco
So, I think this is best describes with the famous statement from the Brundtland Report, which reads, to meet the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable engineering really refers to the practice of designing, constructing and operating systems, processes and products in a manner which minimizes negative environmental impacts and helps to conserve resources. It's an important part of the concept which runs alongside and is really intertwined with the concept of cleantech. But I think today we'll stay on this topic of sustainable engineering, leaving clean tech an exciting topic to delve into and perhaps another podcast, but some of the areas which are important in sustainable engineering are notably renewable energy, which uses well renewable energy sources like solar and winds power, but to integrate it into manufacturing processes to reduce carbon emissions, also resource efficiency, where energy efficient technologies and processes are used to minimize waste and to optimize resource utilization. Another one would be circular economy principles, which really drives and should continue to design products with recyclability and reusability in mind, so to promote the circular economy and reduce the environmental impact attached that really is sustainable materials, which utilize eco friendly and biodegradable materials in product manufacturing to reduce the environmental footprint. And this is usually led from eco design principles and LCA or lifecycle analysis and smart manufacturing, which leverages data analytics and automation to optimize production processes to minimize energy consumption and generally enhance efficiency. So maybe to give you an example of a sustainable technology, HCLTech has a product called My PCM, which helps companies replace more harmful

materials in their products with those which have a smaller footprint whilst maintaining the same properties which are desired. It's even possible to reduce the overall amount of material used using intelligent design, which is really the epitome of the statement I mentioned previously in meeting the needs of the present without compromising the ability of future generations to meet their own needs. Really, it's a huge area which covers even more parts than the example that I've given here, where the main thought behind it, in my opinion, is that it goes into the design at the earliest stage possible considering environmental aspects and in comparison to retrofitting solutions, which is usually a more costly and less efficient way of going about it.

Sukanya Dey
Thank you, James, that was incredibly insightful and quite detailed, if I may add, and definitely it gives an insight on the boundless possibilities and opportunities sustainable engineering presence to us. On that very context, Vijay, if you could help us deeper into how exactly a good product design utilizing sustainable engineering practices can shape the design process and contribute to the creation of more eco-friendly and energy efficient products.

Vijayanand Gejji
Thanks. Certainly we can do a deep dive on good design, leveraging sustainable engineering principles. Sustainable Product Design is a forward thinking and has a long term perspective at its core. The primary goal is to have a positive impact on people, planet and profits. To achieve this, sustainable product design incorporates three potential impact areas which are at the center stage of sustainability. They are environmental impact, social impact and economical impact. Some of the core sustainable engineering principles, like sustainable materials, sustainable manufacturing processes, efficient and durable products, with a great emphasis on reuse, repair and recycling, helps achieving environmental impact related goals. However, sustainable product design is not complete without social and economic impact, managed with an equal consideration and emphasis. Few examples of social impact areas like worker well being, ethical sourcing with greater attention nowadays on the modern slavery conditions and conflict, material sourcing or social impact due to waste generated in manufacturing or from its products, economic impact also has a very important role that is maximizing benefits driven by reducing waste, energy efficiency, renewable energy and materials, all of that. Hence, I would like to reiterate sustainable product design is forward looking, long term and a multi prolonged approach, just to quote some of the approaches, this is my favorite. As such, all of these different multi prolonged approaches are very complex and broad in consideration which need to be bought in a balanced way that that can be possible only through lifecycle thinking. Hence, at HCLTech, we adopt and recommend lifecycle assessments early into the product design and realization cycle. To go into little more detail here, lifecycle assessment gives us the insight we need to find at which stage a product contributes the most emissions. Commonly, it is most at one stage and more than one consideration should be taken into account with clear understanding of impacts and hotspots, design organizations can orchestrate and integrate multiple sustainability engineering principles as a long term practice, for example, design for emotional connect with products are also a strong evolving trend in sustainable product design space, providing a do it yourself creative space and an opportunity as part of the product commissioning and use phase creates a strong bond with the product and users. Just as a specific example to quote here, end consumers paint or add family portrait on an refrigerator door that creates a bond with emotional bond with the product itself, right? And finally, an entire ecosystem, collaboration feedback with all stakeholders is very important, so that all of that can be considered. And once we move forward the a new version of the product with new approaches implemented, we can always have 2.0 as part of the product. So holistic feedback into the overall ecosystem is very important. I think this provides a good insight for the question you asked.

Sukanya Dey
Thank you, Vijay, certainly and if I shift the guess here slightly to explore more facets of sustainable engineering and product design. James, can you help us explore the challenges organizations encounter when transitioning to sustainable product design? And according to you, what have you observed? What are the common misconceptions or hurdles that you've seenand how can they, in general, be addressed?

James Trebilco
That's a really important question. Well. Generally the status quo is a comfortable place to be, right? So when you're you're doing the thing that you're always doing, that's the place that you're feeling comfortable at. But people think that becoming sustainable, or bringing sustainable product design is going to be more work, more things to learn about, more considerations to take into account. And so there is sometimes a resistance and a feeling of extra work that comes about with this. However, efficiency can be synonymous with sustainability. So focusing on efficiency will help across all areas of business. The way the potential roadblock of or change management can be navigated. You know, referring to this with is really with communicating well and openly across a company, adapting standard operating procedures within a company and focusing on the adoption of sustainable practices from the beginning, will make significant and sizable changes, which will improve daily operational performance and bring changes to the company, which will not only help the planets but also the

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success of the company, which I would imagine is the main performance indicator for all departments within an organization and therefore be able to thread all the parts of this together, absolutely,

Sukanya Dey
Just as Vijay had mentioned earlier, people, planet and profit and together ensuring a positive impact on the entire ecosystem, with efficiency being the core. Now focusing on what lies ahead. Vijay, can you highlight a few emerging developments in sustainable materials and manufacturing processes and how do you envision these advancements shaping the landscape of industrial product design in the years to come.

Vijayanand Gejji
Yeah, absolutely, this is very exciting to look into. Literally being innovative is very important to save our planet, if we consider the specific focus for today, product focus in the industrial space, if we really look at that, the advanced engineering on the material side, such as bio degradable polymers or bio fabricated materials and sustainable packaging, now plays a very pivotal role. And talking about the circularity in the industrial products as such as new new trends, product as a service. We have heard about software as a service, but I'm talking about the product as a service instead of owning the product. Large capital intensive products, instead of owning the products, consumers subscribe to those services. Companies retain ownership and responsibility of the product, maintenance, repair and end of life management as well. In this context, let's imagine an industrial fabric washer, where equipment is leased and managed by OEM and the end consumer or organization pay per wash basis. This kind of a models are fast emerging. The other important advancement in the further capital heavy Industries is remanufacturing that specifically we are started seeing in off highway equipments, kind of an equipment, additive manufacturing in low value aftermarket and iotized manufacturing for real time energy monitoring and optimization are furthermore trends. So list goes on like this. To summarize, a good design where we don't consider the product lifecycle as linear, but rather cycle of components and how components are reused, repaired and recycled to minimize the wastage.

Sukanya Dey
Thank you for the incredible insights. Vijay, and to elaborate on the same, a lot of processes are being changed, bringing in an entire shift in the landscape. How do you navigate that? James and if we talk about HCLTech especially, can you give us a few insights on how are we integrating sustainable product design principles to drive both environmental sustainability and business success, per se?

James Trebilco
Yeah, sure. So really, to link, I think both of those, those points you just brought up there, I really think to say that right now, transparency is the name in the game for all companies abiding by the onslaught of regulations which is coming in. It's affecting, really, from from many different engineering focuses, but also from from various others in finance and so forth. But these regulations which are coming in really force companies to change. Which is good news for potentially those those companies who are a bit slower to adapt. It kind of lights the fire, so to speak, underneath them. And understanding this, it's really an exciting area to be in, much like how animals adapted to their changing environments and, you know, kind of brought about evolution. Companies will do the same and they'll adapt and they'll kind of, let's see which strategies are the ones and which tech are the ones that become most successful efficiencies? Synonymity with sustainability is really intrinsic to this answer, where conducting LCAs, as Vijay mentioned earlier and adopting eco design principles and processes will drive down wastage whilst bringing increased potential pricing, material innovation and substitution and an increase of energy efficiency as well, along with the optimization of supply chains and the eventual prediction towards a product as a service model, this is then underlined with the regulatory compliance due to what I was saying earlier, as well as various incentive schemes and increased customer engagement and then the iterative feedback loops, which in turn, will then lead to further benefits and improvement, which kind of closes this positive feedback loop.

Sukanya Dey
I love the statement that you had put out, James, efficiency, synonym with sustainability. And I believe in the heart of everything lies technology. So Vijay, if you could, you know, share a few examples with our listeners of innovative technologies that have significantly contributed to the sustainability of industrial products.

Vijayanand Gejji
Great question. And this is a bit where I get to dwell into few of the exciting things we have been developing and contributing for our customer success. HCLTech sustainability Center of Excellence, has developed a framework for helping organizations to understand where they are on the path of becoming compliant and more importantly, sustainable. This sustainable consulting framework helps companies identify the direction they want to go, what they have to do, how far away they are and what needs to be done to get there. This is accompanied by all of the specific technological interventions and adoption of technologies, alongside helping companies rewrite their standard operating procedures with technology adoption so that sustainable product design is incorporated into

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the day to day operation of the company and of course, while being compliant with latest regulations like CSRD. Touching on the technologies for interventions at our Customers, AI driven sustainable material, alternatives and selections, blockchain based battery passport mechanisms, physics based, digital twins for built environments, for real time sustainability, parameters tracking and interventions associated with that and then comprehensive solution and platform for AI driven data ingestion, monitoring and analytics, as well as reporting. This will tie into guiding our customers on the path, as well as helping them to take specific interventions as part of their path to net zero.

Sukanya Dey
That's great, Vijay, the incredible work that's been done and, of course, guiding our way to net zero, circling back to where we had begun the discussion with. So thank you so much to both of you, James and Vijay, for joining in today and providing us with these terrific insights. If I had to summarize the entire discussion in a few quick sentences, I believe we have thoroughly examined the pivotal role of sustainable engineering and transforming industrial product design for decarbonization. We have touched on how sustainable engineering stands crucial in designing eco friendly systems and products, highlighting its synergy with cleantech. We've also elaborated on energy efficient design strategies and the importance of stakeholder collaboration. We have also touched on the challenges of adopting sustainable practices and predict future trends like circular design and biodegradable materials. Finally, we've moved on to discuss HCLTech sustainability consulting framework as a tool for driving environmental sustainability and regulatory compliance. Overall, we strongly observe that sustainable engineering emerges as a transformative force fostering business success through the innovation and efficiency and at the heart of this lies sustainable product design. Of course, a big thank you to the both of you. Once again, I really appreciate your time and support in making this happen and bringing in such wonderfully intriguing insights, we appreciate having both of you, James and Vijay on the podcast.

James Trebilco
Yeah. Thanks very much, Sukanya. Pleasure to be here and an exciting topic to discuss. So really appreciated the time.

Vijayanand Gejji
Yeah. Thank you very much, Sukanya. It was a very good discussion. And at HCLTech, we are always glad to talk about sustainability and creating positive impact to the planet, as well as for our customers. Thank you so much.

Sukanya Dey
Thanks once again and thank you to the audience for tuning in. Also, please make sure to listen to the next episode in the sustainable engineering podcast series. We will provide a link in the description below once live. Goodbye.

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