

The development of Evolution Music's bioplastic LP: a step towards circular products and production systems in the music industry

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This Evolution Music case study addresses SI2023's key theme by focusing on our journey to develop the world's first commercially available bioplastic LP, as an alternative to high impact PVC LPs. It illustrates how the creative industries in general, and the manufacturers of music industry products in particular, can tackle the inter-connected challenges of climate change, ecosystems pollution and the biodiversity crisis through significant product, supply chain and communications innovation, whilst generating significant business benefits.

Evolution Music's starting point is Einstein's quote that *'we can't solve the significant problems of our time at the level of thinking that created them'*. This fundamental insight informs our approach to business and product development. From this starting point, Evolution Music (EM) was formed as an R&D business to deliver innovations that embody a different level or pattern of thinking to the thinking that's created the multiple significant problems that our culture and economy face.

The practical challenge is to apply a genuinely different level or pattern of 'circular economy net zero' thinking (*CENZ thinking*) to a problem in order to create transformative change. The underlying premise being, of course, that a meaningful (and desirable) form of sustainability requires a) 90+% carbon emissions reductions, b) factor 4 to 10 resource efficiency and impact reduction improvements, and c) non-toxic circular system – within a culture that is desirable.

In this sense, EM was keen to avoid from the outset what might be called 'superficial circular economy net zero thinking', that would only generate marginal change. From a business perspective, our intention was always that if we could develop a physical media product for the music sector that embodied a significant level of transformative change, that would offer significant business opportunities.

Our dominant paradigm is not-profit maximisation but value-optimisation. So Evolution Music seeks to *evolve the music industry through innovation* – to work towards 'regenerative sustainability', which automatically means 'CENZ' in product and manufacturing terms. This is taken forward in part by applying the design philosophy and practice of permaculture in a business context, which seeks to generate value in terms of significant 'earth care', 'people care' and 'fair share' benefits. With the goal of generating commercial value added on top of this to achieve our business aims.

Our practical approach to innovation, R&D and product development involves using principles generated from understanding the workings of nature, which is the only real embodiment of regenerative sustainability thinking, that can help guide our own thinking. Three examples of this are:

Principle 1: *The problem is the solution* – for LP records, the materials used to manufacture LPs are the main problem i.e. PVC. This principle implies that finding new benign materials to manufacture LPs is the solution. We recognised quickly that this meant focusing on bioplastics, rather than considering recycled oil-based plastics for LP manufacturing, which would sustain the use of materials produced through inherently toxic, carbon-intensive manufacturing processes.

Principle 2: *The least change for the greatest effect* – a single change to low impact benign materials *that can be used within existing LP manufacturing machinery and processes*, at comparable cost, sound quality performance and durability levels, would have massive potential for global industry change, and significant commercial potential.

Principle 3: *Working with nature* – music has been a significant force for social and culture change throughout the 20th and 21st century - from blues and jazz, to rock and roll, pop, punk, hip hop and dance music. Music often conveys or relates to a social or political message or movement, such as issues of equity, diversity and inclusion. Climate and environmental messages are now major themes for many artists, often expressed through their music, marketing or public persona. The industry as a whole and fans are increasingly concerned and informed about the music sector's impacts. We can work with this characteristic nature of the music sector, if we have integrity as a company and an improved product with clear environmental advantages, particularly by building natural alliances with the consistently pioneering independent music sector.

To understand the landscape of issues and impacts involved, Professor Kyle Devine's book *Decomposed: the political ecology of music* (Devine 2019) is really the one single reference we would cite for a thorough picture of the environmental and social impacts of LPs, CDs and streaming. Added to this we identified technical studies of the carbon footprint of the bioplastic PLA (polylactic acid) in general uses compared to PVC, which indicated a cradle-to-gate Warming Potential (GWP) of PLA being only 500 gram CO₂ /kg of PLA, a roughly 75% carbon footprint reduction compared to traditional plastics (Morao & de Bie 2019; TotalEnergies-Corbion 2019).

To understand these impacts in greater detail Evolution Music will work with Dr Craig Jones of Circular Ecology to undertake a lifecycle analysis of Evovinyl in 2023, the results of which we be made publicly available. However, whilst measurement is vital, for EM the direction of travel is the priority, as there is already significant data that can be used to confirm the direction we need to take now, without needing more detailed data at every stage.

Based on this available information, we saw that if we could develop a high-quality product that was highly attractive a) in environmental, sound and product quality terms and c) in terms of ease of adoption for the LP manufacturing sector, then the nature of concern and relationships in the sector would mean a lot of support for our work would be likely to from concerned artists, fans and

organisations, and therefore we would see a significant demand for the product. All of this is emerging, and is proving to be the case so far.

In turn, this might then allow us to use the music sector's influence to stimulate wider music sector change, social change, and wider business sector transformation.

Having said that, we recognise that we were applying *CENZ thinking* to a) a high impact product and manufacturing system, using b) that uses only 1 compound material which c) had experienced very little innovation in 60+ years in the manufacturing process, and virtually none in the product. A fairly unusual starting point. So, we were targeting a market where there could be significant potential for transformative change. Relatively speaking, an easy target perhaps.

We also recognise that certain aspects of 'good fortune' have played a significant role. We had an 'inner team' with deep sustainability expertise, excellent project management and R&D project expertise, deep knowledge and significant connections in the sector, creative / out-of-the-box thinking, and a significant degree of the rebellious spirit of rock music and punk. Alongside this, we developed an excellent outer team of key partnerships that spans materials and manufacturing, the music sector, and ethical branding, and an excellent, very helpful Advisory Board.

We were also a little surprised that no one else had pursued this 'obvious' (to us) opportunity, and that, at least in the manufacturing of its products, this very creative sector was really lacking in innovation. How widespread might this pattern be across the creative industries sector?

Subsequently, we've understood that this is because the record pressing companies see themselves as being in the manufacturing sector, not the music business. The music business buys a service (record production) from the manufacturing sector, or from brokers. This distinction is very significant for considering CENZ responses for the creative industries sector, because in many instances these responses need to address and understand both a *creative industries mindset and culture*, and a *manufacturing sector mindset and culture* – which are very different.

From a problem to solution perspective, many of the major impacts and CENZ innovation and commercial opportunities for the creative industries are about transforming buildings and energy, materials and manufacturing, food and events, and transport. Which isn't really about the creative industries as such. Although all the creativity of the sector can be brought to the process of R&D and innovation, and commercialisation of course.

When considering the potential for success, as a start-up micro-enterprise, with little investment behind us, we knew of strong brands that are fully committed to an environmental and social agenda – such as Lush cosmetics, Ecotricity and Patagonia. So, we felt that success would need a clear message and integrity about what we are doing as brand, how we are doing it, and the messages we are communicating, including the information that we make publicly available. Which all fitted with the values of the founders. Finding Level Studios in Stroud was very helpful in this process - an 'ethical only', environmentally aware branding company, with experience of working on major international brands.

For our brand and our communication, it is essential for us to be clear what 'Net Zero' and 'Circular Economy' means for Evolution Music as targets to achieve. Because of own expertise in these areas, we did not look outside for this. What Evolution Music term '3D net zero' can be described in 3 core dimensions:

- **Net zero carbon** – demand / emissions reduction by factor 4 to factor 10 carbon reductions as the first 'big leap' stage of working toward net zero, with a shift to 100% use of renewable energy supplies i.e. in line with IPCC recommendations.
- **Net zero waste** – all materials and resources being able to be cycled back into productive systems, whether these are product manufacturing systems or ecological systems that are carbon binding through soil regeneration and / or ecosystems regeneration for enhanced biodiversity and biomass.
- **Net zero toxicity** - for net zero biodiversity impacts and net zero health impacts, which means non-toxic materials, manufacturing processes and supply chain systems.

Circular economy is based on the standard Braungart-McDonagh concepts of course. However, EM sees a distinction between what might be called:

- I. **'superficial circular economy approaches'** that are essentially about sustaining the status quo of high impact products, materials, manufacturing systems and supply chains for as long as possible, with little likelihood of achieving a meaningful form of 'net zero';
- II. **'meaningful circular economy approaches'** that are consistent with net zero, which have potential to significantly accelerate a shift to 3D net zero outcomes.

For EM, meaningful CENZ approaches are consistent with a state of regenerative sustainability where human systems are living symbiotically with natural systems, for mutual advantage. By taking this integrated approach that is consistent with the regenerative sustainability paradigm, the goal is to put the single 'CENZ' concept in practice in another 3D sense, that integrates:

- i) products;
- ii) manufacturing systems; and
- iii) supply chains.

Ultimately EM needs to (and will) integrate distribution and end-of-life, or the cycle of materials recovery to manufacturing or re-use, but at this early stage for a company of our size the product, manufacturing and supply chain dimensions are enough for now. For EM this focuses on transformations in:

- Materials character and source, including non-toxicity, recyclability and compostability
- Efficiency of energy use and materials in manufacturing and production / harvesting
 - Low to zero waste from manufacturing
 - Significant efficiencies in production to reduce energy demand and wider impacts
- Renewable / clean energy supplies in manufacturing and production / harvesting

In considering the potential of a bioplastic LP we were both a) thinking about and aware of the transformative potential of the product, and b) also thinking about and aware of the transformative potential of the product manufacturing processes and supply chain systems.

As our practical first step, having identified an appropriate materials partner (Colloids Ltd) and pressing plants to work with on a series of R&D trials, we determined that a viable bioplastic LP could be produced. This was supported by formal testing at the National Physical Laboratory, and informal sound testing with engineers and producers with a credible track record i.e. Rob Cass, Cave Productions Ltd, a past in-house producer at Abbey Road Studios (now an EM Director). Our medium-term Vision was always that such a product would demand the creation of a circular economy net zero pressing plant and supply chain system in due course.

CENZ thinking therefore helped Evolution Music to define both a) its short-term practical, commercially focused R&D work, and b) its medium-to-long-term vision for CENZ manufacturing and supply chain solutions for the music industry. We know that by defining this CENZ approach as a way forward for LPs, it has comparable potential for other physical media in the music industry, with potential to be applied to the huge market for merchandise, aka 'Merch', and potentially the creative industries as a whole.

Having been successful in our R&D trials, through ongoing discussions and a series of pre-launch projects, we have seen enthusiasm to take-up the bioplastic LP through a planned transition across:

- i) music industry working groups and activist bodies including the AIM Climate group; Music Declares Emergency; Earth Percent; DJs for Climate Action; Bye Bye Plastic Foundation;
- ii) projects involving highly concerned high-profile artists, with this concern being part of their public profile i.e. we have delivered two commercial scale runs of 500 EPs for Earth Percent with Brian Eno producing Michael Stipe, Beattie Wolfe and Hotchip;
- iii) concerned and forward-looking labels e.g. Ninja Tune; Beggars Group/4AD; etc;
- iv) forward-thinking pressing plants (from small to large) with major investment in existing manufacturing capacity.

Evolution Music sees CENZ music solutions as drivers for social and economic transformation. As part of our brand identity, we will use our website, sample LPs with sleeve notes, guidance packs for customers, projects with campaigning organisations for education, awareness raising and movement building, particularly by working with enthusiastic and influential artists and indie sector campaigning organisations.

Our goal is that concerned, enthusiastic and satisfied customers become powerful advocates, through their appreciation of high quality and desirable CENZ products. Our intention is that by contributing to a music-driven social movement for change, Evolution Music will be seen as being at the leading edge of that process. To maximise this potential, we need to invest in building a brand with integrity and related social media activity. Meanwhile, we can save on marketing, because through our partnership pilot projects in effect the campaigning groups, labels and artists do our marketing for us.

Evolution Music's 3D CENZ framework is set out in table 1 below.

Evolution Music's 3D CENZ framework				
3D Net Zero	Product <i>Shift to low impact materials</i>	Manufacturing (Record Pressing) <i>Low embodied & operational impacts</i>	Supply Chain (materials production) <i>Low embodied & operational impacts</i>	Distribution & product reclamation / end-of-Life
Net Zero Carbon	Initially <25% carbon impact expected, to be confirmed through LCA; Goal is to achieve <10% carbon impact;	Shift to 100% renewables; 15%+ energy saving in manufacturing;	Shift to 100% renewables;	To be determined
Net Zero Waste	Product / material 100% compostable (industrial composting) & / or 100% recyclable;	'Waste' material from manufacturing fully recyclable – 'regrind' – with no loss of quality of product performance;	Compostable / usable 'waste' from materials production;	Non-toxic compostable product at end-of-life
Net Zero Toxicity	Non-toxic compostable product in use and end-of-life	Non-toxic manufacturing processes	Non-toxic production of materials	Non-toxic compostable product at end-of-life
Additional Benefits	Zero static product – reduces dust and wear-and-tear for extended product life.	Up to 50% higher production efficiency (units / hour); Zero static in manufacturing (less risk of dust contamination leading to rejects)		
<p>Summary of key benefits so far:</p> <ul style="list-style-type: none"> • Estimated product carbon impacts < 25% of PVC (to be confirmed through LCA) • 15% energy saving in record pressing process • Up to 50% higher unit production (records pressed / hour) 				

Case Study Conclusions

In summary, this case study describes the key factors needed to ensure that CENZ solutions in the creative industries are technically and commercially viable, scalable, and drive transformative change.

Evolution Music's 5 approaches to accelerating music sector and creative sustainability industries are:

1. Practical application of the CENZ model
2. Purpose driven R&D, product and manufacturing partnerships – for product and supply chain solutions that can achieve R&D targets of **at least 50% impact reduction** as a starting point.
3. Movement building partnerships – to drive demand and increase awareness
4. Education and skills building – because people generate and deliver CENZ solutions
5. Develop a brand with purpose and integrity in all these areas.

EM's replicable CENZ practices that can be taken up across the creative industries are:

- 1) Identify and substitute non-toxic low embodied carbon materials with comparable performance, and reasonably comparable costs for high-impact materials;
- 2) Determine the least changes that can be made in manufacturing processes to enable easy adoption (avoid new machinery with high embodied carbon impacts);
- 3) Determine cost-effective options for shifting to a) higher efficiency manufacturing systems (i.e. efficient in energy and materials), and b) renewable energy supply systems, ideally with enhanced energy security built in.

With a pre-launch project pipeline in excess of £250,000 and quotes out in excess of £1mn, and full launch planned for late May, EM is progressing its mission. That EM Mission is to demonstrate that manufacturers of music industry products can tackle the challenge of climate change by developing genuinely CENZ products, manufacturing processes and supply chain systems that a) deliver significant transformation of impacts (not superficial change), b) fit with existing manufacturing processes, and c) deliver healthy cashflow and returns for investors, and positive work for staff. To achieve this mission, the essence of Evolution Music's sustainable business model is that it is an R&D business that commercialises its innovations to create viable CENZ solutions that have:

- a) significant scalability;
- b) significant and verifiable impact reduction.

From Evolution Music's perspective, circular economy net zero solutions are doable if, and perhaps only if, we have the freedom to adopt appropriate low impact materials, manufacturing and energy systems, which will perhaps only arise by adopting appropriate evolutions in our thinking.

References:

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