TOM MASKILL 2022 Young Talent Award Submission

09/01/2022

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# How do you see print products (graphics and packaging) in the circular economy?

Switching from a linear to a circular economic model is a key weapon in humanity's fight against climate change. Successfully transitioning would lead to environmental benefits – including a 22% – 44% reduction in greenhouse gas (GHG) emissions in 2050 compared with the current development path, and economic benefits, generating multi-trillion-dollar economic opportunities through better access to goods, increased connectivity, and reduced pollution (MacArthur, 2021) and avoiding the \$54tn USD in damage a 1.5°C rise in global temperature would cause (Masson-Delmotte et al., 2018). Recognising this, in 2016 the EU launched a €24bn Circular Economy Package with an aim to make sustainable products the norm, reduce waste, lead global efforts on the circular economy, and improve on the current circular material use rate of 11.8% in the EU (ec.europa.eu, 2020).

Print products and our industry have an excellent opportunity to be at the fore of the development of this new economy. Already, 74% of wood and 90% of pulp purchased by our industry in Europe is FSC or PEFC certified (Sustainability Report, 2018), and so is sustainably sourced, with continued developments in creating wholly recyclable products. To become a truly circular communication solution, the industry must consider 4 key areas as outlined in Accenture's 'Waste to Wealth' report, namely: Circular Supply Chain, Recycling & Recovery, Product Life Extension, and Product-as-a-Service (Lacy, P. and Jakob Rutqvist, 2015).

## **Circular Supply Chain**

The primary characteristic of a circular economy compared with a re-use or linear economy is that raw materials (virgin materials) are either not used or supplement recycled materials (non-virgin materials) to create products. As such, if the aim is to move to a circular solution, printers should seek to utilise non-virgin materials where possible.

The method used for producing a print product dictates the number of consumables needed and the depth of the supply chain required. For example, for an offset litho press, there are approximately 22 consumables and components which contribute to waste whilst an inkjet press has around 4 (see Appendix 1). As such, different manufacturers will have very different challenges when it comes to establishing a circular supply chain and integrating non-virgin materials and sustainable practices into their production workflows. A good place for printers to begin becoming more circular is paper, given paper makes up between 60 and 70% of a typical print product's carbon footprint. Using sustainably sourced paper is a start, but to develop into a fully circular solution, designing print products which can easily be recycled to create a high standard of secondary product (a product which utilises a high proportion of non-virgin materials) is crucial. A key barrier to this has been the de-inking process being costly and leading to subpar secondary products. However, it is now possible to use a variety of different sustainable inks to design print products which can be more easily recycled. Tests run on inks by INGEDE (an organisation founded by leading European paper manufacturers) scores inks based on the deinkability of printed products across various machines (Digital print technology for a circular economy, 2021). When making investment decisions, print manufacturers should consider using these tests and metrics to design their workflow with circularity in mind. The example of ink selection is but one of several factors of production which should be considered when developing a circular supply chain.

# Recycling & Recovery

Recycling and recovery schemes are already well-engrained into European society. In the world of print, this manifested itself originally with the recycling of toner cartridges in the 1990s following the WEEE Directive and subsequent EU law change in 2003. Whilst recycling schemes started out as add-ons, they are now big elements of sustainability programs, and a substantial industry in itself, with circular activities generating close to €147bn in Europe between 2016 and 2019 (European Commission, 2019).

Many organisations now offer free recycling of printed materials, with profits coming from the sale of the recycled materials. However, some key challenges remain for the print industry to develop further in this space. First, we have the design of the printed products themselves. Up to 80% of a product's environmental impacts are determined at the design phase (ec.europa.eu, 2020), manufacturers need to educate themselves and their customers on sustainable product design to ensure products can be wholly recycled. Some financial incentives have been created historically for sustainable product design, such as Royal Mail's Greenpost discount for mailings which hit certain recyclability criteria. Sadly (and controversially) this incentive was pulled and not replaced by Royal Mail at the end of 2021, but similar financial incentives for circular product design would have a significant impact on the circularity of our sector.

Second, is education of the end consumer. Having developed a postage carbon calculator over the last year with Enviromail, Webmart calculated (and had the calculations certified) the carbon emissions for 'end-of-life' recycling or disposal of print products based on DEFRA averages:

EXAMPLE	FACTORS	CO2E (KG)
Non-recyclable	100,000 mailing packs. 30g weight per item. Non-recyclable material	3,126kg CO2e
Recyclable	100,000 mailing packs. 30g weight per item. Recyclable material	656Kg CO2e

As you can see, ensuring the print product is fully recyclable and, crucially, the end customer knows that the print product is recyclable so is disposed of correctly is hugely impactful in reducing the impact on the environment and ensuring circularity.

Finally, we have developing recycling methods which produce a useable product. This starts with ensuring recycling plants receive materials with few to no contaminants which allows for clean fibre for recycling, creating a superior product and mitigating costs. Implementing practices across the industry's customer base and within manufacturing plants themselves to ensure paper and card is collected separately to other materials will have a big impact on the circularity of our industry.

## **Product Life Extension**

As well as designing the end print product for circularity, we can also increase the lifetime of a printed product as well as the machinery used in its creation to mitigate the environmental impact. This starts from extending the product's life through design and repair rather than planned obsolescence and replace. To achieve this, companies' finances need to be aligned with extending the life of their products. One way to do this with machinery is through product-as-a-service, discussed later. With printed products themselves, there are myriad ways to extend a product's useful life on which printers can advise customers. A couple of examples are below:

Linking the physical with the digital is a great way to extend the useful life of a printed product. For example, a firm could utilise QR codes on a catalogue to link customers to a particular web page. This page could be updated weekly with new offers and incentives very cheaply, easily, and sustainably. Not only does this increase the useful life of the catalogue, as the customer has an incentive to retain it and scan it weekly, but increases their exposure to the advertiser's brand, driving ROI.

With POS (point of sale) using frames whose graphics can be replaced drastically reduces the overall environmental impact of a piece of in-store POS. Rather than having to replace the whole unit regularly, only small elements need to be replaced to change the messaging in line with the company's requirements.

## Product-as-a-Service

Aligning supplier's financials with circularity is a sure-fire way to increase uptake of these practices. A great example of this in our industry is the Managed Print Services sector. Selling MFDs (multi-functional devices) as a service, rather than the individual units themselves, financially incentivises these organisations to 'sweat their assets', and get the most out of them as economically as possible through design, repair, and recycling rather than planned obsolescence and selling new kit. This is often more economical for the customer as well, allowing for better planning, regular upgrades (through software and additions rather than new MFDs) and mitigate capital expenditure. This capital expenditure is subject to depreciation, ultimately giving the device a net book value (NBV) of £0 which is likely inaccurate and could artificially reduce the useful life of the product.

## Conclusion

Overall, the print industry is moving in the right direction to become a fully circular operation. It is important to recognise that different organisations in our sector will face different challenges, and without financial incentives (or disincentives) it may be challenging to encourage some end customers to make the switch to circular alternatives. For Europe and print to be at the forefront of circularity globally, our sector must focus on these four key areas, and collaborate to solve the numerous logistical, technological, and societal barriers. None of which, in my view, are insurmountable.

# What is your vision for print for a sustainable future?

With a view to ensuring print's future as a sustainable medium, there are several things which I believe need to happen. First, we must establish clear and consistent ways to quantify the impact a particular piece of print, MFD, piece of machinery, or process has on the environment. Second, we need to educate companies and end users on the true environmental impact of print compared with alternative communication methods (such as digital), and tackle greenwashing – a key enemy to progress. Finally, we need to create an international community to tackle this macro issue globally, rather than individually. Sharing knowledge, innovations, and best practice to expedite our transition to a circular and sustainable sector.

#### Calculate

Being able to accurately calculate, report, and validate environmental impact is challenging in an industry as varied as print. We use a huge range of machinery, raw materials, and logistics solutions to come to an end product, which is then used in a variety of ways. The common standard currently is to calculate a carbon equivalent factor and use this figure to compare alternatives or to determine how much to offset to produce a 'carbon neutral' or 'climate positive' product. The issue here is there are lots of small suppliers who will carry out carbon calculations, lots of methodologies to go about calculating the CO2e of a print product, and lots of different voluntary standards which one can use to guide the calculations, all with slight nuances leading to different figures. In addition to this, ill-defined terms like 'climate positive' lead to different organisations offsetting different amounts of carbon but claiming the same standard. For example, a group of Scandinavian companies agreed a definition of offsetting 10% more than the calculated carbon footprint to be deemed 'climate positive', others in the UK (such as Enviromail) define the term as offsetting twice the calculated carbon footprint, with other environmentalists suggesting the term should be reserved for products which themselves have positive environmental externalities (with such externalities themselves being only loosely defined), rather than simply offsetting more. Once a carbon footprint is calculated, offsetting is then often confusing, with many companies claiming to 'accredit' environmental schemes to different standards with different impact.

The upshot here is it's very difficult to compare apples with apples even within our own industry. This provides undesirable financial motives for end customers and suppliers alike. It is financially beneficial for all parties to use a carbon calculation with the smallest carbon footprint, even if it isn't the most accurate. It is then financially beneficial to support an accredited carbon offsetting scheme with the cheapest price, rather than the largest impact. To combat this, it's crucial that we develop and utilise a common industry-wide practice for carbon calculation. This may be achieved through proper adoption of standards like ISO16759, and creating certified bodies who can evaluate, validate, and homogenise carbon calculations across printers globally. Starting with accurate calculations, suppliers in our sector will then be able to use this data to improve their own practices, compare themselves with others in their sector, and allow end customers to select based on sound data. The standard developed within our industry should be similar in scope to standards in other industries (like digital) to allow end customers to assess which communication method best allows them to achieve their goals with the minimum environmental impact.

## Educate

Second, we need to educate the wider population about the actual impact of printing on the environment. We have been inundated over the last decade with calls from companies to switch away from paper-based communications in favour of email under the guise of reducing our impact on the environment. In truth, these communications were likely driven by financial motivations rather than environmental, with an email being cheaper to send than a piece of mail. Organisations like Two Sides in the UK have been fighting against such greenwashing, even engaging in legal action against common culprits. Unfortunately, however, much of the damage is done; and since the carbon emissions of digital are harder to see than that of print, the public now have a false perception of print being environmentally unfriendly compared with digital, and some even view companies which continue to use print as environmentally irresponsible. Changing this perception will have a huge positive impact on our industry, and it starts with accurate calculations of both physical and digital channels. Once we have accurate carbon calculations, we should display these across all communications so the wider population can assess the environmental impact themselves. Some companies and industries have already adopted a similar practice, with travel being a great example. Several market leaders display the carbon footprint of train and plane tickets prior to purchasing them, giving the customer the information they need to make informed decisions.

# Community

Finally, we need to treat this global issue as an international community, rather than as individual companies. Innovation, best practice, and implementation techniques needs to be shared across our sector, rather than hoarded to generate a competitive advantage. To facilitate this, market leaders and governing bodies like Intergraf should create an international forum to allow players in our sector from around the world to share best practices. Models for this exist successfully in other sectors, with B Corp being an excellent example. Now gathering momentum in Europe as well as America, B Corp is a global standard and community for profitmaking businesses to manage their companies responsibly from an ethical, environmental, and societal standpoint. Creating a similar initiative and community in print united by ensuring an environmentally sustainable future for our sector should expedite improvements and align our goals.

# Conclusion

I believe we must establish common standards for calculating and reporting on the environmental impact of print. This data will not only allow us to compare ourselves with other players in the industry and other competing sectors but form the basis for our own continual development. We must also educate our customers and the public on the true impact of print on the environment compared with other communication methods. There is much to be done here following a period of financially motivated greenwashing and mass misinformation. Finally, we should create an international community for our industry united around the common goal of establishing an environmentally sustainable future for the print sector. Devising incentives and facilitating the free movement of best practice, innovation and implementation will be challenging, but we must take a global view when tackling this global issue.

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# Appendix 1: Components of different print methods

Offset litho resources which contribute to waste: (Digital print technology for a circular economy, 2021)

- 1. CTP processor
- 2. Offset litho press
- 3. Anti-set-off powder
- 4. Blankets
- 5. Fount solution
- 6. Waste packaging
- 7. Cleaning solutions and cloths
- 8. Proofing printer
- 9. Plate chemistry
- 10. Cleaning time
- 11. Blanket wash
- 12. Alcohol dosing
- 13. Ink waste
- 14. Proofing paper
- 15. Blanket cleaning time
- 16. Chemistry containers
- 17. Wastepaper
- 18. Plate bending and storage
- 19. Platesetter maintenance
- 20. Roller wash
- 21. Rollers
- 22. Processor cleaning

Inkjet resources which contribute to waste:

- 1. Press
- 2. Inks
- 3. Primer
- 4. Inkjet head cleaner