

# Written evidence submitted by In2tec Limited

## Electronic Waste Evidence

### Implementing a Circular Economy for Electronic Goods

- What steps are being taken to move towards a circular economy for electronic goods? How can the UK Government support this transition?

Electronic goods, by their very nature, contain Printed Circuit Boards (PCB) that at their end-of-life, will at the very best be stripped of valuable materials, such as gold, meaning that some 95% will end up as landfill.

The global PCB market is estimated to reach \$89.7 Billion by 2024, with a CAGR of 4.3% from 2019 to 2024. The major growth drivers for this market focusing on the increasing demands in the communication industry, growth in connected devices, and advancement in automotive electronics. As such, this situation is only set to get worse over time as demand for electronic enabled devices increase.

We are becoming better as a nation at handling the recycling of many goods, including the roll-out of domestic recycling bins and recycling centres that handle base materials, such as metals, plastics and paper. However, to date there has been little or no focus on e-waste in the form of PCBs.

As with the drive for electric vehicles, as opposed to petrol or diesel, the only way to focus activities of companies to drive change is either through public demand or legislation. In order to reduce the e-waste created by PCBs and facilitate the reuse of electronic components the UK Government should look at setting targets, or providing legislation to define targets for the reuse and recycling of electronic components and PCBs.

- What is the environmental and human health risk from e-waste? How significant is it and who is most at risk?

The amount of electronics entering landfill is huge and always includes a mixture of many metals and materials that can take many millennia to break down, if at all. These compounds can then leak out into the surrounding landscape and water table. Whilst there is little known about the long-term effect of burying PCBs as they are relatively new, I believe everyone accepts that sending to landfill what could otherwise be useful such as viable components is not desirable.

Places like India, Vietnam, China, Singapore and Pakistan, are among those where electrical waste is shipped for "recycling". Whilst reports of improvements are cited in Environment & Society Portal for methods of recycling and conditions and safety of those undertaking this work, more action is needed to protect people and the environment where such sites are located. Moreover, we have the opportunity to significantly reduce the need for such sites, and protect all from the risk to environmental and human health.

- How can secondary markets for electrical goods be improved? What incentives are required to implement these markets?

Current PCB's are assembled using traditional solder with a reflow temperature of 240-250°C. At the end-of-use, these PCB's have little recyclability other than the extraction of precious metals. However, alternatives to traditional solder assembly are available that can increase the recyclability of PCBs from typically under 5% to over 90% by allowing components to be easily removed, 'un-zipped', therefore allowing for reuse of components and precious materials and thus feeding into a greater true circular economy.

Such a process means that a components usefulness does not have to end just because the PCB to which it is mounted has reached its end of useful life. These components can be cycled for reuse meaning that they no longer need to go straight to landfill.

This creates the possibility for the generation of secondary markets in used components, reduces the demand on black-market 'copies' and extends the life of discontinued parts.

The UK has the potential to lead the world in taking a stand on PCB and electronics recyclability and component reuse.

Specifically:

- Introduce legislation and targets backed by the potential of tax-breaks for companies meeting these targets, including VAT exemptions on recycled components.
  - Make grants available to businesses to develop new reuse technologies and processes outside of the current WEEE community.
- Why does recovering materials from electronic waste pose a significant challenge? What support is required to facilitate the adoption of recovery technologies?

The traditional methods of production, largely driven by low-cost offshore manufacturing, mean that extraction and cleaning of components for reuse is near impossible due to the temperatures and processes involved.

Whilst more work is needed to confirm both the alternative processes and performance of the completed parts after production, there are alternative mechanisms equivalent to these traditional solder techniques. These new approaches to PCB assembly would undeniably benefit the environment and lead to the generation of secondary markets for component reuse.

In order to drive the adoption of such technologies and allow for the extraction and reuse of PCB components, new specialised recycling centres are needed. Currently there is little incentive for companies to adopt such capabilities. Having a joined-up strategy backed by legislation on recyclable content, phased in over time, supported and motivated by tax breaks, would ensure businesses and councils focus on delivering such developments.

## UK's Electronic Waste Sector

- Are UK Waste Electrical and Electronic Equipment (WEEE) collection targets achievable? What challenges do UK producer compliance schemes and WEEE reprocessors face in meeting the collection targets?

In order to develop and implement such systems as needed for specialised reprocessing, companies will have to make investments. In order to achieve this, additional incentives, such as tax breaks, are needed to encourage a more dynamic materials reprocessing market.

This is especially true in specialised areas such as PCB recycling and component reuse which has been largely overlooked to-date. Legislation on recycling targets for these specialised areas would be key to drive such investment and in so doing, would also move the UK to the forefront of technology for e-waste end-of-life recycling.

- What causes fraud in the UK's e-waste system? How can this be addressed?

From a PCB components perspective, fraud occurs as unscrupulous entities portray fake or lesser components as original and branded parts. Building a strong second-hand market for the reuse of genuine components could have a significant positive impact on this backdoor market.

- What action can the UK Government take to prevent to the illegal export of e-waste to the developing world?

Illegal export of PCB e-waste would be dramatically cut by accelerating and generating incentives for electronic component reuse. Driving the reuse of the electronic components would result in a significant reduction on e-waste going to landfill, as happens currently.

- What proposals does the UK Government need to consider as part of its consultation on WEEE?

The government should be looking at legislating for goods to have a percentage level of recyclability and/or reuse. This has already happened with the policy on electric cars, which has significantly affected the developments of automobile manufacturers. This is particularly relevant for PCBs and electronic components where the population is becoming more and more reliant on electronic devices in this IoT world.

- Is UK public awareness of e-waste recycling satisfactory? If not, how can it be improved?

The introduction of recycle bins and collections has undoubtedly increased the public awareness on recycling. However, the knowledge of what happens to the recycling and the benefits it brings is not well disseminated to the public at large nor indeed understood.

The public awareness would be increased by showing a 'rebate' against council tax relative to the level of recycling achieved in the area in the last 12-months. This would help focus minds and activities to ensure, as individuals, as much material as possible gets recycled.