



E-Waste Trading Zones and the Economy of Greening: Imbricating Computer Sourcing in the Pre- and Post-WEEE Directive Era

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Abstract

In the context of the environmental impacts caused due to the increasing volumes of discarded technologies (e-Waste), this article critically evaluates whether environmental policy, the Waste of Electronic and Electrical Equipment (WEEE) legislation in particular, can contribute to a shift in logic from neo-liberal growth to green growth. Drawing upon empirical research we show how three computer waste organisations evolve through the imbrication of pre- and post- policy logics in collaborative and heterogeneous ways to create an economy of greening. Extending the concept of a fractionated trading zone, we demonstrate the heterogeneous ways in which computer sourcing is imbricated, providing a taxonomy of imbricating logics. We argue that what is shared in a fractionated trading zone is a diversity of imbrications. This provides for a nuanced perspective on policy and the management of waste, showing how post-WEEE logics become the condition to continue to pursue pre-WEEE logics. We conclude that our research findings have important implications, more specifically, for how e-waste policy is enacted as an economy of greening in order to constitute the managerial and organisational adaptation needed to create a sustainable economy and society.

Keywords: e-waste, fractionated trading zone, imbrications, institutional logics, environmental policy.

1.0 Introduction

The UK Government's 2017 Clean Growth Strategy supports the on-going ambitions to further develop institutional contexts for green growth, through investment in sustainable business and job creation, at the same time as producing "a low carbon economy" (BEIS, 2017: 2). With the target of "zero avoidable waste by 2050" set and to be reached through "resource value maximisation and environmental and carbon impacts for extraction, use and disposal reduced" (ibid.: 16), the waste sector is receiving considerable focus. With waste juxtaposed as one of the barriers and solutions to a "low carbon economy", we critically evaluate whether legislation, the Waste of Electrical and Electronic Equipment (WEEE) in particular, can create a shift in logic from neo-liberal economic growth to a greener veneer in computer waste disposal organisations.

By analysing e-waste policy, we can gain a greater purchase on current attempts for more sustainable material use as outlined in the European Commission's 2018 Circular Economy Action Plan. Drawing upon empirical data gathered from three computer enterprises – Information Technology Asset Recovery Organisation, Recycling SME, and Repair and Reuse Charity (pseudonyms), we address the enactment of policy in relation to legislative changes that focus on green growth. In 2003, the EU created the WEEE Directive, which was transposed into UK law in 2006. WEEE aims to control Electrical and Electronic Equipment (EEE) through promoting the waste hierarchy – reduce, reuse, recycle, recover. A new logic was created – e-waste management, based on a set of beliefs that discarded electronic devices are harmful to the environment so unauthorised disposal should be

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3 discouraged and devices recycled regardless of profitability (Kama, 2015). Through
4 these sets of beliefs, e-waste disposal practices reduce occupational and
5 environmental risks and at the same time preserve non-renewable resources.
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7 Previously, e-waste was managed according to a waste management logic - a set of
8 beliefs focusing on the extraction of economic value from any profitable waste in
9 order to address depleting reserves of non-renewable resources, without disrupting
10 continued economic growth and consumption demands (Waste Framework Directive
11 (WFD), 1975:194/39). The success of any policy rests upon how organisational actors
12 interpret the instruction into their working practices. We demonstrate how pre- and
13 post-WEEE policy logics create what we refer to as 'the economy of greening' which
14 is still premised on economic growth centred models that create space for new
15 opportunities and address ecological and social concerns by chance (Schulz and
16 Bailey 2014; 277, 288). Its existence is reliant on the interconnection of the pre- and
17 post- e-waste policy logics reproducing continuities in practices. Institutional logics
18 imbricate in order to create an economy where organisations undergo change in order
19 to mediate change, which has implications for reducing waste and new policy
20 agendas. The logic of such an economy is that it has green economy ideals but retains
21 elements of the past. Whilst there is no agreed definition, a green economy is
22 conceived as a pathway to sustainable development through the adoption of more
23 ecologically and socially balanced economic models (ibid.: 285; United Nations
24 Environment Programme (UNEP), 2011; Wanner, 2015: 22).

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51 In this paper, we argue that the implementation of waste policy, with an explicit
52 institutional logic to promote the 'greening of the economy', does not just overturn
53 existing waste management and organisational practices. Our contention is that when
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3 examined at the level of management and organisational practices, the pre- and post-
4 WEEE periods can be described as a particular type of “trading zone” (Galison, 1997:
5 783), that can be classified as “fractionated” (Collins et al., 2007). A fractionated
6 trading zone is heterogeneous collaborative space for differentiated views and
7 practices to be learnt, shared and developed. We further develop the notion of a
8 fractionated trading zone by adding the concept of imbrication (see Hayes et al.,
9 2014). Conceptually, imbrication pays attention to overlapping logics that have no *a*
10 *priori* connection to each other. We utilise these ideas to illustrate the particularities
11 and granular dynamics that comprise a fractionated trading zone for e-waste. Within
12 this e-waste trading zone, what is reproduced are differentiated, diffused and
13 fragmented imbricated logics that coalesce around the materiality of e-waste. The e-
14 waste sector has particular boundary crossing qualities in terms of organisational
15 interaction, communication and adaptation. For a fractionated trading zone to occur,
16 the particularities of existing institutional logics get shaped through interaction with
17 the emerging institutional logic of the green economy.
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38 This paper’s contribution is threefold. Theoretically, we extend the literature on
39 trading zones and imbrication by considering how they can complement one another.
40 Our focus on imbrication is a ‘zooming in’ on the managerial and organisational
41 implications and dynamics of a trading zone. In other trading zone studies, this sort of
42 fine-grained and close up analysis of imbricated logics is neglected (Galison, 1997;
43 Collins et al., 2007; Finch and Geiger, 2010). Second, we add to the literature on
44 imbrication by identifying a diverse range of imbricating logics that can be used to
45 discern a more nuanced understanding of the translated effects of policy. Last, we
46 ground these ideas in a relevant empirical context – that of e-waste management in
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3 the UK, providing a deeper knowledge, over time, of specific actors' translations of
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5 policy into organisational practices.
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9 We begin by introducing trading zones, institutional logics, imbrication and e-waste,
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11 or more specifically computer waste in the UK context. Our research findings
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13 emphasise the heterogeneity of pre- and post-WEEE responses and this led us to focus
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15 on imbrications within a fractionated trading zone. An overview of the research field,
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17 method and analysis then follows. After detailing our empirical cases, our discussion
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19 concentrates on differentiated imbrications we discerned. This article concludes by
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21 summarising the key findings and the contribution of extending our understanding of
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23 the e-waste trading zone's imbricated logics by offering our taxonomy of differing
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25 types of imbrication.
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31 **2.0 Connecting Trading Zones, Logics and Imbrications**

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33 Galison (1997) coined the term "trading zone" while researching communities of
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35 physicists. From his original focus on scientific cultures, the concept has been applied
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37 more widely to other sectors and interactions, such as markets in the making (Finch
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39 and Geiger, 2010). Originally contributing to Kuhn's (1962) paradigm
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41 incommensurability debate, Galison (1997: 783) writes that a trading zone comes
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43 about when
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47 "two groups can agree on rules of exchange even if they ascribe utterly different significance
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49 to the objects being exchanged; they may even disagree on the meaning of the exchange
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51 process itself. Nonetheless, the trading partners can hammer out a local coordination despite
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53 vast global differences".

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55 The concept of the trading zone highlights the level and degree of communication,
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57 interaction, and learning and development between differentiated views and practices.
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3 Collins' et al. (2007) develop the concept of trading zone, distinguishing four
4 different types. For Collins et al, a trading zone is characterised by a community that
5 has deep problems of communication yet still can be considered as communicating.
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7 Whilst Galison (1997) focused on the development of "inter-languages" to afford
8 communication, Collins et al. broaden the understanding of trading zones along two
9 continuums: collaboration-coercion and homogeneity-heterogeneity. From this they
10 create four categories - adding fractionated, subversive and enforced trading zones to
11 Galison's initial depiction of an inter-language trading zone.
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22 Like all trading zones Collins' et al. (2007) identify, interaction does not result in
23 unity. Whereas an inter-language trading zone is characterised by collaboration and
24 homogeneity, the specific character of a fractionated trading zone is collaboration and
25 heterogeneity in which differences remain ever-present. Nonetheless, the trading zone
26 exists because individuals share a 'fraction' of each other's lifeworld: a fractionated
27 trading zone is characterised by selective interaction, often through some shared
28 material, symbolic and/or cultural resources. This produces enough of a consensus –
29 whether that is through materials or other resources – for trading zone work to occur.
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42 Because of the difficulties of communication and interaction, Galison's concept of
43 trading zone emphasises the zone as much as the trading. Indeed, as Finch and Geiger
44 (2010) suggest, if interaction is uncontentious there is simply trade not a trading zone.
45 Adding the concept of imbrication to a trading zone helps us analyse the type, scale
46 and degree of interaction, communication and boundary spanning activity between the
47 logics within, giving a more nuanced account of imbricated logics as well as revealing
48 the diversity of ways certain actors in the e-waste sector are responding to WEEE. As
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3 we will show, a trading zone is comprised of institutional logics, with different kinds
4 of constraints and possibilities, which are emergent in relation to how imbrication
5 occurs within it.
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11 Trading zones are comprised of institutional logics which can be defined as “socially
12 constructed, historical patterns of material practices, assumptions, values, beliefs, and
13 rules by which individuals produce and reproduce their material subsistence, organize
14 time and space, and provide meaning to their social reality” (Thornton and Ocasio,
15 1999: 804). Logics are taken for granted ways of framing, understanding and acting in
16 the world by actors: logics are “master principles” that simultaneously guide, enable
17 and constrain social action (see Greenwood et al., 2011: 21), and, in so doing, provide
18 a link between individual agency, forms of cognition and socially constructed
19 institutional practices.
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33 The concept of logics emerged because of the need to understand the way that
34 individuals make connections, creating a shared purpose and unity within a particular
35 field (Reay and Hinings, 2009: 629; Scott, 2008). Existing research has focused on
36 dominant logics and how these are adopted to trigger institutional change (Randall
37 and Munro, 2010; Reay and Hinings, 2009; Thornton, 2001; Thornton, Jones and
38 Kury, 2005). However, few studies appear to focus on the coexistence of logics
39 (Marquis and Lounsbury, 2007) or how they collaborate and co-mingle (Randall and
40 Proctor, 2013). Despite advances in the institutional logics literature, it appears
41 further attention is required to show how logics co-exist (Hayes et al., 2014; Introna
42 and Hayes, 2011; Suddaby and Greenwood, 2009; Lounsbury, 2002), and interact in
43 heterogeneous ways, something that we aim to address in our article. Therefore,
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3 institutional logics are not separate from one another as they overlap, and through
4 permeating each other, they create new ways in which logics trigger change (Hayes et
5 al., 2014).
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11 The concept of imbrication is similarly concerned with explaining durable patterns.
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13 Leonardi (2011) defines the term, from the Latin *imbricāt*, which denotes overlapping
14 of parts in a sequence, (originally the placing of roof tiles, scales or leaves so that they
15 overlap and interlock) without giving necessarily *a priori* privilege to one or another.
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17 Leonardi (ibid. : 151) writes that “the differences between the tiles in terms of shape,
18 weight and position prove essential for providing the conditions for interdependence
19 that form a solid structure”. In the context of this study, imbrication denotes the
20 arrangement of distinct elements in an overlapping pattern so that research can “better
21 explain how the accumulation of the past bears changes on the present [...] without
22 resorting to deterministic language” (ibid.: 152).
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36 Imbrication suggests that distinctions between institutional logics remain important
37 yet also reciprocal, self-reinforcing and reinforcing each other. The concept has been
38 deployed in a range of contexts to understand organisational communication (Taylor,
39 2001), risk and technologies (Ciborra, 2006), human and material agencies (Leonardi,
40 2013; Introna and Hayes, 2011; Leonardi, 2011), and space, place and digital
41 networks (Sassen, 2008). Sassen (2008) describes the growing mutual imbrication of
42 the non-digital and digital in relation to national territories, place and digital
43 networks. Sassen’s concern is to demonstrate how territorial and digital spaces are
44 interdependent yet irreducible to each other. The “financial centers, which are after all
45 located in national administrative territories, enable the global digital space for
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3 financial transactions and its new temporal order. The centers are themselves
4 transformed by this imbrication with digital networks” (2008: 383).
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8 Sassen’s deployment of the term imbrication adds to the institutional logic literature
9 by showing how new institutional logics are enabled by existing ones in ways that can
10 both transform and sustain an existing institutional logic: existing institutional logics
11 enable, persist and transform during the emergence of new ones.
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19 Leonardi (2011: 152) observes that imbrications create “organizational residue”
20 which have “staying power”. This staying power, which he describes as
21 “infrastructure”, is premised on the interdependency of institutional logics. In terms of
22 institutional logics, infrastructure is the residual pattern of interaction created by
23 imbrication when logics compete, collaborate or co-mingle. Institutional logics are
24 themselves made up of previous imbrications; therefore the way in which an
25 emerging institutional logic is viewed is connected to how imbrication previously
26 occurred. In other words, established norms condition and enable how people
27 imbricate emerging institutional logics.
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41 For the purposes of our article, the institutional logic of the ‘economy of greening’
42 enables the logic of the ‘greening of the economy’ while simultaneously maintaining
43 (material aspects) and transforming the former’s (symbolic) features. Similarly, we
44 argue, that the computer waste organisations we researched are the conditions for the
45 implementation of the WEEE legislation. They are changed in various ways by this
46 law, but these changes often reinforce particular existing logics. “The products of
47 prior imbrications lay the groundwork for continued organizing in that they provide
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3 the routines and technologies that people can use to structure their actions” (ibid.:).
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5 What this means is that past imbrications already exist, thus current institutional
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7 logics are themselves the result of imbrications.
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11 A central feature of the contribution of imbrication is in terms of its use in analysing
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13 interaction of institutional logics over time without resorting to a deterministic
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15 framework. Imbrication helps us understand how the accumulation of the past bears
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17 on the present (ibid.). Sassen (2006) argues although there is a simultaneous
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19 interdependence, this does not produce hybridity (see Glynn and Lounsbury, 2005 or
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21 Thornton et al., 2005). By contrast, each logic maintains its own identity and
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23 irreducible character. Specifically, imbricated institutional logics are a potentially
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25 productive way to understand the coexistence of logics.
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32 Despite the increasing use of imbrication, one dimension that appears to be lacking is
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34 the idea that highlights the differentiated interconnections of institutional logics and
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36 how they might become pre-requisites for each other’s existence (Hayes et al., 2014),
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38 within a particular type of trading zone. Understanding trading zones, alongside logics
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40 and imbrication, emphasises two features. First, the specificities of a trading zone are
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42 opened up for analysis, extending existing ways of analysing trading zones. This adds
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44 additional richness to the different ways actors interact, in our research, around e-
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46 waste, extending the conceptual disunity of interaction and communication that
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48 Galison (1997) discerned. Second, it allows us to connect institutional logics and
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50 imbrication to a more nuanced understanding of trading zones, featuring the diversity
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52 of ways that scale and time is enacted in different types of trading zone. Our focus is
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3 on the heterogeneity of imbrications within a fractionated trading zone: differentiated
4 imbrications that occur over time and across organisations.
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10 **3.0 E-waste, Computers and the Pre- and Post-UK WEEE Era**

11 In 2016, 1.6 million tonnes of e-waste was discarded in the UK; this is the equivalent
12 of 24.9 kilograms per person (Baldé et al., 2017). The waste sector has been forecast
13 as a growth sector with the potential for creating 15,000-25,000 jobs (Sadauskas,
14 2015), and economic growth in the region of £23 billion (WRAP, 2017). One
15 category listed in the e-waste legislation is discarded IT and telecommunications
16 equipment (EU WEEE, 2003; 37), that make up 7% of e-waste, contain critical non-
17 renewable materials such as gold, silver, copper and platinum as well as hazardous
18 substances including cadmium, lead, mercury and phosphors (Hieronymi, Kahhat and
19 Williams, 2013), making e-waste a rich site for value extraction. In addition, IT waste
20 poses security risks too, as equipment such as computers can store confidential
21 information. The WEEE Regulation (2006) actively encourages the marketization of
22 e-waste, and its component parts, triggering organisations to adopt alternative
23 methods to achieve their aims.
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42 Before the transposition of the UK WEEE Regulation, computers were handled in
43 accordance to waste management legislation that attempted to encourage EU member
44 states towards a 'recovery and recycling society' (WFD, 1975). This encouragement
45 was due to the growing awareness of "the limits to growth" regarding resource
46 scarcity (Meadows et al., 1972), coupled with the research undertaken by the
47 Economic and Social Committee concerning land, air and soil degradation. Created
48 in the era of the European Economic Community (EEC), the pre-existing 'waste
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3 logic' focused on establishing common markets creating economic and social
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5 cohesion (Bache et al., 2011). According to the 1975 WFD:

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7 “any disparity between the provisions on waste disposal already applicable or in preparation in
8 the various Member States may create unequal conditions of competition and thus directly
9 affect the functioning of the common market; whereas it is therefore necessary to approximate
10 laws in this field, as provided for in Article 100 of the Treaty [... and] effective and consistent
11 regulations on waste disposal which neither obstruct intra-Community trade nor affect
12 conditions of competition should be applied to movable property which the owner disposes of
13 or is required to dispose of under the provisions of national law in force. [In addition..,]
14 Member States shall establish or designate the competent authority or authorities to be
15 responsible, in a given zone, for the planning, organization, authorization and supervision of
16 waste disposal operations [...]; the recovery of waste and the use of recovered materials
17 should be encouraged in order to conserve natural resources” (WFD, 1975: 194/39 - 40).
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20 These policy extracts highlight the ethos of waste management concentrated on
21 generating competitive advantage selling recyclables, through governance via
22 legislation, and managed through public administration. Until the WFD (1975) the
23 relationship with the natural environment was one that was viewed very much as an
24 externality, as historically, waste legislation would consider economic and social
25 benefits above environmental ones (ibid.; Bache et al., 2011), with waste being
26 symbolic of a means to an end.
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38 In the late 1990s, when the European Commission first discussed how to handle EEE
39 waste (Commission of the European Communities, 2000), a change occurred in
40 computer waste management. These sets of beliefs were created in the era of the
41 European Union (EU), where the environment started playing a more prominent role.
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46 The WEEE Directive states:

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48 “the achievement of sustainable development calls for significant changes in current patterns
49 of development, production, consumption and behaviour and advocates, inter alia, the
50 reduction of wasteful consumption of natural resources and the prevention of pollution
51 [...and] Member States shall ensure that any establishment or undertaking carrying out
52 treatment operations obtains a permit from the competent authorities, in compliance with
53 Articles 9 and 10 of Directive 75/442/EEC [Waste Framework Directive] [...In addition].
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3 Member States may choose to implement certain provisions of this Directive by means of
4 agreements between the competent authorities and the economic sectors concerned provided
5 that particular requirements are met [...]plus] Where appropriate, priority should be given to
6 the reuse of WEEE and its components, subassemblies and consumables. Where reuse is not
7 preferable, all WEEE collected separately should be sent for recovery, in the course of which
8 a high level of recycling and recovery should be achieved. In addition, producers should be
9 encouraged to integrate recycled material in new equipment.” (WEEE Directive, 2003; 37/24-
10 29)

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12 The new type of green growth is supposed to focus upon the triple bottom line of
13 social, economic and environmental considerations (UNEP, 2011); driving towards
14 creating a win-win scenario between environmental protection and economic growth,
15 managing for sustainability was the newly found ethos. The governance of e-waste
16 was undertaken in the form of licencing legislation (see The Waste Management
17 Licencing Regulation 1994 for the transposition into UK Law, for a more detailed
18 explanation of the licencing requirements) and industry accreditation standards started
19 to appear, giving guidance on best WEEE disposal practices (e.g. Defra’s Best
20 Available Treatment on Recovery and Recycling Techniques, 2006) and International
21 Standards Organisation (ISO) data security (British Standards Institute (BSI), 2008).
22 However the management of e-waste began to have a wider remit than just public
23 administration. Partnerships were created between government and non-government
24 bodies to allow for discussion and influence of policy; examples include the Producer
25 Compliance Schemes, WEEE Advisory Board, Environmental Heritage Service,
26 Environmental Industry Commission and the Industry Council for Electronic
27 Recyclers (Author 1, 2012). Moreover, awareness campaigns hosted by governments,
28 private, public and third sector organisations were undertaken to provide incentives
29 for financial remuneration for the old equipment, using take back schemes (BIS,
30 2014). The shifting relationship with the natural environment was one of
31 interdependence, as e-waste now symbolised an end in itself, as the discarded product
32 is a resource (Kama, 2015; Neyland and Simakova, 2012). However, as Adam (1998:
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3 113) suggests, environmental policy “can only be created in the context of a ‘higher
4 authority’” which is not to undermine the EU’s primary goal of economic growth and
5 in addition “only environmental issues that fit into already existing schemes have a
6 chance of getting on the EU’s environmental agenda”.

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14 *Insert Table 1: Summary of Waste and E-waste logics*

15 16 17 18 **4.0 Researching e-waste**

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20 The data in this article was drawn from a wider investigation exploring the
21 incorporation of e-waste legislation into the working practices of six different
22 organizations in the UK Computer Waste Management field (Author, 2012). Data was
23 generated from ethnographic engagement, specifically taking inspiration from
24 Czarniawska’s (2004) mobile ethnology following an “action net [...] assemblages of
25 collective actions, connected to one another because they are perceived within a given
26 institutional order, as requiring one another” (Corvellec and Czarniawska, 2013: 5). A
27 mobile ethnology allows a researcher to study the work of individual people who
28 move around (Czarniawska, 2004), in an attempt to acknowledge the speed at which
29 organized activities take place and the messiness of institutional arrangement (Author,
30 2018).

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47 This approach is relevant to our research as we are exploring the enactment of policy
48 to stimulate change and development towards green growth, and for some a
49 transformation away from a singular focus on economic growth. Some scholars, such
50 as Lindhqvist (2000), put forward a compelling argument that the WEEE legislation is
51 a mechanism to finance collection and recycling, however, policy often has multiple
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3 goals and is often internally contested. Adopting an action net perspective allows the
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5 researcher to understand “what is being done and how this connects to other things
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7 being done” (Czarniawska 2004: 784), in our case the sourcing of computer waste
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9 that highlights alternative goals of policy. The method begins with a series of
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11 interviews to explore the process in order to produce standardised accounts of the
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13 working practices taking place, alongside organisational documentation. The next
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15 phase, required Author 1, to follow the trajectory of the computer through each of the
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17 organisations, shadowing or working alongside the actors involved. It should be noted
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19 that the author entered each site, post WEEE implementation. Focusing on the action
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21 enabled Author 1 to move fluidly with the workers to understand a collective account
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23 and not an isolated story (ibid.). Moving with and between the workers enabled
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25 Author 1 to gain insight into the pre- WEEE era. When actors spoke of changes to
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27 current practices, Author 1 was able to corroborate the accounts against other
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29 explanations and the standardized story that had been created in stage 1. As
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31 Czarniawska reminds us, the researcher never enters the research at the start of the
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33 story. This approach is in keeping with the theoretical framing of this paper on two
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35 counts. First, from an ontological perspective, as with the theory of imbrications, the
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37 method is concerned with understanding how actors interpret organisational
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39 phenomena. Second, epistemologically, social constructivism, like trading zones,
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41 view organisations as independent cultural phenomena that are constantly adapting to
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43 their environment and are made up of multiple networks of actors with their
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45 subjective viewpoint (ibid.; Thornton and Ocasio, 1999).
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51 As previously mentioned, we focus on three organisations – IT Asset Recovery
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53 Organisation (IARO), Recycling SME (RSME) and Repair and Reuse Charity (RRC).
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55 These organisations provided services and advice to corporations, governments,
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3 consumers and charitable institutions on effective e-waste disposal practices. Each
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5 enterprise had been in operation for at least a decade prior to the legislation coming
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7 into force. Due to their longevity, we consider they offer the opportunity to critically
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9 and constructively compare how logics are altered. How, and if, the institutional
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11 logics of environmental policy altered working practices had not been considered at
12
13 the time of the initial analysis in 2008-2010, but emerged due to subsequent
14
15 conversations between the authors of this article sometime after the field research had
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17 taken place.
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22 Data was collected in four ways: interviews with senior managers and operational
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24 staff (17 formal and 46 informal), participant observation (246 A4 pages) and
25
26 organisational documentation (e.g. working practices, annual reports, advertising
27
28 brochures, working practice documentation). The three types of data and the adopted
29
30 software tool (Atlasti) enabled the findings to be examined for common themes
31
32 (Abramson and Mizrahi, 1994). Re-interrogating the organisational texts, participant
33
34 observations and the interviews of the organisational actors provided insight into how
35
36 they made sense of the legislation in relation to institutional logics.
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42 **5.0 Computer Sourcing – Imbricating Logics Post and Pre WEEE Eras**

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44 Through our three-exemplar cases, we show a range and diversity of imbrications;
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46 specifically focusing on sourcing waste enables us to place the spotlight onto how the
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48 institutional logics of a fractionated trading zone imbricate.
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52 *5.1 Recycling SME – Sourcing Metals:*

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3 RSME is a 50-year-old family scrap metal business that has undergone significant
4 expansion over the years. In 1998 they moved into IT recycling and asset waste
5 management, offering services that included basic collection, disposal, inventory, data
6 wiping and hard disk removal, alongside their core business functions - recycling and
7 processing of metals, cars, car tyres and skip hire (RSME Brochure, 2005).
8 Purchasing and then merging with local recycling facilities, by 1999, RSME operated
9 out of five locations (RSME Internal News, 2013). Typically they sourced their IT
10 equipment from public sector contracts, such as local councils via the civic amenity
11 sites. The Managing Director advised that profits made in the early days related to
12 “*gate fees*”, costs associated with collection and treatment of waste, and this charging
13 was “*absolutely fundamental to being able to sustain a business ... anything else is*
14 *then a bonus and it is a difficult bonus to get*”. With the challenge of obtaining
15 further economic value from discarded IT equipment, such as data services, resale of
16 components and/or equipment for reuse, discussions took place as to what direction
17 RSME should head and what market opportunities there were.
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38 The organisation employed a WEEE Manager in 2001/2 to focus specifically on the
39 impact of the forthcoming legislation. In 2003, a decision was reached to invest in the
40 recycling of hazardous waste elements of IT – in particular the Cathode Ray Tube
41 (CRT) computer monitors and televisions. The Managing Director explained that
42 monitors “*were coming at us quick and fast*” and at that time “*there was an export*
43 *market for reuse*”. The forthcoming legislative mandate, requiring CRTs to be
44 treated separately from other collected WEEE, due to the hazardous phosphors
45 (fluorescent coating) inside the monitors (WEEE Directive, 2003; 37), and the market
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3 demand, triggered RSME to invest £40,000 in recycling equipment and a further one
4
5 million pounds to expand into a new warehouse (Research Journal, 2008).
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9 After the UK WEEE Regulation came into force, RSME made further changes to
10
11 their business operations in 2007. Their waste management licences to process, store
12
13 and handle specific types of waste were expanded to include what could and could not
14
15 be processed (see Waste Management Licencing (Amendment) Regulation 2003; 3-
16
17 5). In addition, a change in sourcing occurred as manufacturers became responsible
18
19 for meeting the cost of recycling and were required to provide evidence to the
20
21 relevant authority (WEEE, 2006; 12, 15). This imbrication of pre- and post- WEEE
22
23 logics repelled one another. With the change in legislation sourcing e-waste became
24
25 much more uncertain due to manufacturers' new found interest in the consumer
26
27 electronics disposed at civic amenity sites. Previously, RSME sourced most of the
28
29 discarded technologies through the public sector and directly from civic amenity sites.
30
31 Their contracts altered as the manufacturers and manufacturing consortiums took over
32
33 the relationships due to their new obligation (e.g. evidence of waste volumes and cost
34
35 absorption). The repelling imbrication undermined any interlock between public
36
37 administration and partnership logic. In fact, the public administration became
38
39 unimportant for RSME because of the changing nature of the circulation of e-waste.
40
41 The Strategic Development Manager elucidated that the "*shift has been from working*
42
43 *with big waste management companies, that were looking after the [civic amenity]*
44
45 *sites, to the [manufacturing consortium ...] our main source of WEEE will always be*
46
47 *[with manufacturing representatives] purely because the [manufacturing*
48
49 *representatives] want all the WEEE in the UK".* RSME were pushed towards
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51 working with a different group of partners. As well as the shift in contracts, the
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3 legislation brought with it the need for further reporting and subsequently generated
4 significant amounts of paperwork (UK WEEE Regulation 2006: 35).
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9 Although there was an increase in demand for the processing of certain elements of IT
10 equipment, the organisation witnessed a decrease in demand for IT asset recovery.
11 Confused by which direction to take, the CEO described how this area of the business
12 “needed some resources” and RSME “allowed that to drift due to the slower demand
13 and lower income stream”. By the end of 2008, the IT Waste Operations Manager set
14 up his own company partnering with RSME. They “would supply the material and
15 [the IT Waste Operations Manager] could work his magic on it. Allowing [RSME] to
16 keep [their] market share and the business but, have an outlet at the same time”
17 (CEO Interview, 2009).
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31 The pre- and post- WEEE policy logics confounded against each other, triggering a
32 divergence in company practices. Despite expanding, the most significant change that
33 occurred was the shift from being a profit centred business to a labour focused one.
34 RSME reinvented themselves in 2009, opening a new organisation comprising of
35 three elements: the commercial venture – the recycling services, investing in people
36 through training in recycling and waste management, and a charitable operation
37 aimed to support socially and economically disadvantaged individuals in their return
38 to work (Research Journal, 2009). RSME’s vision was to continue expansion by
39 building eco-commercial buildings using products they had made from waste, and
40 employ individuals who had been supported through their charity to aid integration
41 back into the workplace. The emphasis of the new organisation was social as well as
42 environmental. This periodization of imbrication is an example of what Hayes et al.,
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3 (2014) discern as the unintended consequence, which is not the outcome of one
4 particular logic, but is emergent from their imbrication. The logic of waste
5 management appeared to imbricate with the post-WEEE logic of accountability for
6 the natural environment, through the triple bottom line. For the Managing Director the
7 biggest WEEE legislative impact was “*people, people and money, in two fairly equal*
8 *measures – recruiting people to comply with the legislation and money in order to bid*
9 *for large contracts*”. At RSME, the logic of waste management is coupled around the
10 logic of hazardous waste; a narrowing of the waste management to particular types of
11 e-waste provides a new and emergent opportunity for business growth. Examples
12 include the expansion of the hazardous recycling services that required 20 people to
13 process 500 computer monitors; and the investment in training socially and
14 economically disadvantaged people in the recycling trade.
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31 Although the decision was to refocus on metals and training, RSME chose one
32 element of the computer - the disposal of CRT monitors because there was a high
33 volume, an export market for reuse, and they held the pre-existing waste permits.
34 This business opportunity, which gives contemporary expression to the issue of social
35 cohesion, relies on the affordances created by handling waste, yet expands RSME’s
36 focus on human resource training and skills development that centres on hazardous
37 waste management. By the end of the research, in 2009, RSME operated out of six
38 locations, employed 132 members of staff, were the recipients of a prestigious British
39 Business Award for sustainability and enterprise, and had generated a gross profit of
40 several million pounds.
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55 *5.2 IT Asset Recovery Organisation and Sourcing Services:* 56 57 58 59 60

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3 In 1991 IARO started off as an entrepreneurial endeavour by two individuals who
4 sourced and auctioned discarded computers, later expanding into selling equipment on
5 behalf of clients for a commission. Their service offered clients a relatively easy
6 solution to old IT removal e.g. collection and resale. In the late 1990s the owners
7 noticed a coterie of customers gathering at the end of the auction to purchase
8 equipment that no one was sure worked. The CEO remembered selling the equipment
9 at a loss *“I am up there going ten, five, anyone? Anyone? Nought? Take it away?
10 Nothing? Take it away? Nothing nought, then minus five, we will pay you a fiver to
11 take this away”*. At this point the CEO recognised that IARO was in a different
12 market e.g. asset recovery. In conjunction with broken equipment not selling, their
13 corporate customers were asking questions about data security and where the IT
14 equipment was ending up. IARO shifted its trading activities to focus on a service
15 business around collection, data disposal, electrical safety testing, function testing,
16 removal of client identification markings, resale of reusable equipment to the second
17 user market, recycling and an audit report for their clients (The History of IARO
18 Documentation, 2009-2015, para.1).
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40 Initially, IARO offered all their services from one warehouse that comprised of two
41 areas with freestanding lockable units that looked like large garden sheds. The IT
42 equipment was sourced from a variety of places in the UK - the Government, the
43 public sector, private business and private households. By 1999, the ownership of
44 IARO transferred to a European IT infrastructure sales and support leader, as their IT
45 Recovery and Remarketing Division. With the newfound service focus, IARO joined
46 the International Standards Organisation (ISO) accreditation body for environmental
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3 management (ISO 14001), health and safety (ISO18001) and quality management
4 (ISO9001) (International Compliance Manager Interview, 2009).
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10 By 2001 IARO employed an Environment and Safety Manager/Head of Sustainability
11 who become responsible for the organisation's WEEE compliance. The Manager had
12 been involved with WEEE since 1997, when the first UK discussions began, and had
13 served as a member of the UK's WEEE Advisory Board. Continuing to grow, IARO
14 gained recognition for their innovative IT Asset Management practices and
15 commercial success from the British Business Awarding body.
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25 After the advent of the EU WEEE legislation in 2003, IARO purchased their waste
26 management licences so that they could store and handle e-waste, and subsequently
27 purchased a third warehouse. Once the UK WEEE Regulation was mandated, in 2007,
28 IARO increased their recycling services by dealing with some of the technology
29 components on site. The new legal requirements for e-waste management processes
30 appeared to trigger pre- and post- WEEE logics to complement each other, by
31 providing the platform to create new services. What became apparent was an even
32 tighter interlocking of logics such that competitive advantage and managing
33 sustainability became increasingly connected. As can be seen above, prior to WEEE,
34 the ethos IARO was situated in computer auctioning and looking for competitive
35 advantage by expanding their services. Imbricating ethos logics pre- and post- WEEE
36 can be characterised as drawing upon past antecedents, the search for new services,
37 with the post WEEE logic strengthening and reinforcing existing practices (Leonardi,
38 2011). For example, with the introduction of the role of Environmental Safety
39 Manager to oversee compliance, multiple references were made to environment
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3 issues, but the significant change was the consolidation and entrenchment of data
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5 security services. When the Reuse Manager was asked what the most significant
6
7 changes had been since joining the organisation he replied
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10 *“the focus was on the data security side of things, and the environmental reuse, as opposed to*
11 *the requirements of the WEEE Regulation ... what we do now is a lot tighter, from a security,*
12 *from every point of view, everything is a lot more controlled than it was ten years ago.”*

13
14 The IT Data Security Services now included onsite data removal, hard-drive
15
16 shredding, the ability for clients to log onto IARO’s systems to track their devices and
17
18 software removed data up to a UK Military of Defence standard. This reinforcement
19
20 of existing practices, typifies how the waste logic of competitive advantage is
21
22 bolstered at the same time as the logic of managing sustainability becomes
23
24 increasingly predominant.
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28 In 2008, IARO employed 38 members of staff and opened their component resale
29
30 business. *“That department didn’t exist [...] and does now and is doing twice as much*
31
32 *than is expected with regards to what the WEEE Directive says”*, recounted the
33
34 Recycling Manager. Going from strength to strength, the organisation received
35
36 another British Business Award, this time for setting an example benchmark in
37
38 environmental, social and economic development. However, the WEEE legislation
39
40 had begun to impact on IARO practices in terms of their ability to keep their ISO
41
42 accreditations. One of the recycling team mentioned that *“in order to conform to the*
43
44 *WEEE standards we have had to change how we do things so that we can keep our*
45
46 *accreditations”*. This was contrary to the views of other members of the organisation
47
48 who believed that *“WEEE has raised awareness but if it had not happened I think we*
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50 *would be doing very much the same thing anyway”* (International Compliance
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52 Manager, 2009). Clientele were interested not just in data security but also in
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3 legislative compliance and would ask what practices IARO adopted. The Service Co-
4
5 ordinator, International Compliance Manager and Head of Sustainability reiterated the
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7 point and they all stated that now they “*had to be very explicit*”.
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11 With the implementation of the legislation coinciding with the economic downturn, of
12
13 2008, there was a slowdown in sourcing equipment to maintain the sales of reuse
14
15 equipment. By 2009, gaps became noticeable at the distribution plant storing
16
17 refurbished equipment for resale. “*We are buying in a lot of equipment in to sell now.*
18
19 *The enigma is we can buy stuff from our competitors and sell it for a higher margin*
20
21 *and yet when we bid for contracts we are losing out to people that we are literally*
22
23 *buying stuff from*” (Head of Sustainability, 2009).
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29 The decrease in longevity of IT equipment (Bakker et al., 2014) and the
30
31 commoditisation of e-waste, due to manufacturers and non-private households
32
33 (public, private and third sector organisations) bearing the cost for disposal appeared
34
35 to slow down the stream of available IT equipment. Starting life as a computer
36
37 auction company, it seemed only fitting that IARO altered their practices, albeit
38
39 momentarily, to source computers another way in order to fulfil demand (i.e. to
40
41 purchase them from a competitor). Bratteteig and Verne (2012) focus on the degree
42
43 to which imbrications are more or less tightly interlocked, to the extent that they are
44
45 characterised as entangled. Similarly, Post WEEE afforded IARO with the ability to
46
47 continue what they were doing through the greater entanglement of their existing
48
49 approach, which focused on sourcing and selling second-hand equipment and security
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51 and compliance. IARO’s attention on ISO accreditation in Information Security
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53 Management and continual efforts to demonstrate legislative compliance demonstrate
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3 the increasingly entangled pre- and post- WEEE logics. In this pre- and post-WEEE
4 imbrication, IARO sought new ways to maintain and extend existing practices over
5 time by increasingly integrating sourcing and security. By the end of the research,
6
7 IARO operated out of four different warehouses, achieved a further ISO accreditation
8
9 in Information Security Management (27001), was processing 50,000 IT units a
10
11 month, on average tracked 1.5 million units a year, and employed 158 members of
12
13 staff (Annual Financial Statement, 2009), with an average turnover of £25 million.
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20 *5.3 Repair - Sourcing Funds*

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22 RRC started in 1997 in a garage where one man collected furniture “*one afternoon a*
23
24 *week and distributed to people who could not afford things*” (Induction Manager,
25
26 2008). The idea inspired the founder to formalise the charity in 2000. RRC’s
27
28 principle objectives were to divert waste from landfill, sell reused and unwanted
29
30 household goods at a low cost to local economically disadvantaged people, and offer
31
32 training provisions to assist individuals with re-entry back to work. It was around the
33
34 same time that the organisation started to branch out and include collection, repair and
35
36 maintenance training, and resale of electrical goods. 96% of the operational costs for
37
38 the charity were generated through funding grants with organisations, such as the UK
39
40 National lottery or government volunteer schemes (Financial Statement, 2002).
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46 RRC first became aware of the opportunities to get involved with IT reuse in 2001. A
47
48 grant was awarded due to the involvement RRC had with the nationwide Furniture
49
50 Recycling Network (Delivery Project Executive Interview, 2008). Through the
51
52 network, the Project Manager and the organisation had gained a reputation as a
53
54 charity that had expertise in both waste management and social accountability. By
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3 2005, RRC were able to introduce IT maintenance and repair to their training
4 portfolio, and the sale of reused computers. The 10-week course provided the
5 platform for trainees to learn how to make repairs and maintain IT systems. Seven
6 tonnes of equipment materialised, far higher than anticipated, and as a result RRC
7 moved into a larger warehouse to meet the new demand. Despite having a strong
8 relationship with their local community, the pre- and post- WEEE logics confronted
9 each other. Pre- WEEE RRC received computers donated from private households
10 and local businesses. Ironically, although the initial volume of equipment exceeded
11 expectations, the charity started to see a slowdown once the legislation was mandated.
12 The vision of the new warehouse dealing with just IT did not materialise. One
13 explanation placed the onus on the legislation raising awareness through targets set
14 for e-waste recovery *“for us as a re-user it is [the WEEE legislation that is] killing*
15 *reuse, because there is more money in recycling it, stripping it and honestly, the*
16 *WEEE, the whole waste hierarchy is reduce, reuse, recycle. Recycle is further down*
17 *because it costs more energy to recycle but in environmental terms it is killing reuse,*
18 *which is stupid”* (DPE Interview, 2008). The introduction of the legislation had
19 exacerbated competition for discarded computers and increased awareness of data
20 security matters.
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44 Even after the UK legislation was announced, the course proved to be popular but due
45 to the size of the IT workshop, there were limited spaces (Research Journal Two,
46 2008). On average, each computer cost £37.00 to £46.00, took between 15 minutes to
47 5-6 days to repair, and sold in various RRC outlets for £30.00-£120.00.
48 Incongruously, the computers were not selling, raising concerns for the IT Workshop
49 Manager as to the future of his department given that he had *“to achieve £2000 a*
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3 *month to break even [...] and to contribute to the full running of [RRC] [...] £56,000*
4
5 *a year*". The confrontation between the existing logic and the legislation afforded the
6
7 opportunity for additional training provision to be offered, helping people back to
8
9 work, diverting goods away from landfill to be resold to the disadvantaged
10
11 community, and reinforcing the overarching aims of the organisation.
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14
15 RRC's running cost averaged one million pounds in 2007 (Financial Report, 2008).
16
17 By this time period, the organisation had expanded to run eight schemes, inclusive of
18
19 the IT repair and maintenance. Previously, each scheme was underpinned by different
20
21 grants but RRC had begun to experience less success and the grant income generation
22
23 had fallen to 46%. With the expansion, RRC began offering commercial contracts,
24
25 but by 2008 their grant income had dropped to just 10%. The Delivery Project
26
27 Executive expounded, "*we [have] got £100,000 of grant income that is £900,000 we*
28
29 *have got to find from somewhere. We have got to make that money and it is very hard*
30
31 *to make, well there are not many businesses in [Northern England]... that make a*
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33 *million pounds a year.*"
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40 Having attended the initial seminars and discussion in 2001, the WEEE legislation
41
42 provided the platform for the DPE to generate £12,000 for a month's work by offering
43
44 consultancy services so that the Charity could continue their training opportunities
45
46 (DPE Interview, 2008). Reinforcing the shift into a more commercial mind-set, the
47
48 manager responsible for the volunteers stated "*we have to operate like a business,*
49
50 *albeit be competitive, so we advise the volunteers that they cannot discuss matters*
51
52 *outside of work*". The IT Manager also saw an opportunity and began to sell
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54 computer components on eBay.
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5 Not dissimilar to RSME, post-WEEE, the slowdown of funds, reduced volume of
6 computers and having moved into a new warehouse to anticipate the influx, RRC had
7 to make decisions based on generating revenue to keep the Charity in operation.
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9 Drawing upon third sector and commercial logics simultaneously, the organisation-
10 generated funds through the resale of reused goods, grants from charitable
11 organisations, consultancy, and from government funding for the training provision
12 they provided. The fraternization between waste and e-waste logics contributed to the
13 opportunity for the DPE to attend the additional Government training sessions and
14 build upon his expertise in the waste field. By the end of the research, significant
15 changes had taken place, but the organisation had not shifted away from their
16 principal markets.
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31 Our focus on imbrication denotes an analytical concern with distinctive expressions of
32 interdependency over time and place. What can be extracted from our research is that
33 the imbrication of waste and e-waste logics takes a multiplicity of forms across the
34 three e-waste organisations studied: the WEEE legislation creates a multiplicity of
35 differentiated interconnections as waste and e-waste logics imbricate historical
36 antecedents and discontinuities, preoccupations with cross-sector partnerships, the
37 ethos of sustainability, industry standards and licences to operate, judgements about
38 market opportunities, and new expressions of value. Table 1 summarises how these
39 different elements of waste and e-waste logics create particular imbrications.
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53 **Insert Table 1: Imbrications and Waste Logics here**
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6.0 Discussion and Conclusion

Our research suggests that a fractionated trading zone, characterised by collaboration and heterogeneity, also extends to the diversity of imbrications that can be witnessed. The range of imbrications we have illustrated focus on the materiality with less emphasis on the ‘inter-language’ interaction between companies and other organisations: what is shared in this e-waste zone are the imbrications of pre- and post-WEEE logics enacted through the materiality of e-waste. In that sense, our findings extend the concept of a fractionated trading zone through imbrication and reinforce the unique feature of a fractionated trading zone, which is that inter-language communication is not key.

The pre- and post-WEEE legislation logics we have analysed demonstrate differentiated and multiple imbrications. The six imbricated logics we have discerned, are not the only possible institutional logics, however they can act as a fruitful entry point for other researchers interested in exploring the implications of legislative change at an organisational level in a variety of contexts. As we have shown, imbricated logics do not have to integrate with each other in order to have meaning and impact in a particular context. We have discerned differentiated forms of imbrication across three companies showing how the distinctive features of an institutional logic are brought out.

We have analysed and discerned six imbrications pre- and post-WEEE – that is, how they reproduce continuities within a fractionated trading zone. It is worth noting that a trading zone can change its form – there is no single best trading zone of course – but

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3 to foster novelty and innovation a trading zone needs to become space where different
4 imbrications meet, new ways of speaking and understanding are learned, and
5 knowledge and expertise shared. This emphasises the interactional difficulties and
6 time-intensive nature of innovation in a fractionated trading zone. It also highlights
7 the limits of a legislative based approach to change, such as embodied in the WEEE
8 directive for our three-exemplar cases. Without careful, sustained, nuanced support
9 and guidance that goes beyond legislative and economic practices, we think the
10 economy of greening is likely to remain the dominant feature of e-waste management.
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22 It is a cliché that the challenges and opportunities of contemporary environmental
23 problems do not come neatly packaged nor are they easily managed. What can be
24 extracted from our research outlined above, is that there are multiple logics occurring
25 at the same time within a fractionated trading zone, imbricating in a diversity of ways
26 and this affords various forms of material and cultural communication, action and
27 agency across communities, policies and practices: the WEEE legislation affords the
28 formation of an emergent institutional logic of the green economy while also
29 functioning, as we have shown, as a potential site for “the economy of greening”.
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42 Focusing on the imbricating institutional logics would be a productive avenue for
43 future research particularly when conjoined with the concept of a fractionated trading
44 zone. When a new institutional logic, such as the UK WEEE Regulation, is
45 considered as a discontinuity, ushering into existence a green economy, we forget the
46 ways in which existing institutional logics imbricate or condition, rather than cause,
47 emergent institutional logics to create what we term an “economy of greening”. In
48 each of these imbrications, we have shown a multiplicity of logics in the pre- and
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3 post-WEEE legislation era. Imbricated relationships are never of one kind as we have
4 shown; in a fractionated trading zone institutional logics will infuse, be
5 complementary, conflict, problematize, bind together and sometimes interact at a
6 distance. We have shown how imbricating institutional logics can provide insight into
7 how change and continuity occurs within a fractionated trading zone: imbricated
8 institutional logics play an integral role in the reinforcement of prevailing practices -
9 the economy of greening, whilst they are simultaneously framed as something novel
10 or what others refer to as the green economy.
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22 Although we have focused on imbricated logics within a fractionated trading zone, in
23 response to the EU 2003 and UK 2006 versions of the WEEE legislation, our findings
24 can be used in different contexts. Nonetheless, there are particularities and limits to
25 the generalisations from our study of a limited number of companies in a particular
26 period. Recent interest in the circular economy, an economy premised on keeping
27 goods and materials in circulation for as long as possible and by default minimises
28 waste (European Commission, 2018), might require a different approach from policy-
29 makers. Otherwise, as Schulz and Bailey (2014), Gregson et al. (2015) and Adam
30 (1998) remind us, the past antecedents that emphasise economic growth above all else
31 are likely to prevail in the future.
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46 To conclude, we have shown three example cases to specify imbrications in relation
47 to existing institutional logics in a fractionated trading zone. These imbrications are:
48 confounding, repelling, complementary, infusing, confrontation and fraternization.
49 We have shown how the logic of e-waste created organisational working practices
50 that fell back into neo-liberal ideals centred on economic growth thus promoting “the
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3 economy of greening”. Given the emphasis on the discontinuities brought about by
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5 technological innovation, our findings illustrate the continuities of fractionated
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7 trading zone practice: within a fractionated trading zone, the heterogeneity of
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9 imbrications served to re-create the prevailing logic of an economy of greening. We
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11 think that further research on imbrication in a fractionated trading zone would be
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13 valuable and hope our research has contributed to this agenda, to enrich insights into
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15 the impact of policy in the e-waste sector and, more widely, in understanding how
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17 more sustainable ways of resource usage might be fostered and further developed.
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Table 1: Summary of Waste and e-Waste logics

	Waste logic (1970's)	e-Waste logic (1999)
Era of	EEC – Common Market	EU - Triple bottom line
Ethos	Competitive advantage	Managing for sustainability
Governance	Legislation	Legislation and accreditation
Managed by	Public Administration	Partnerships
Relationship with the natural environment	Blindness and an externality	Interdependence

Table 2: Imbrications and Waste Logics

Imbrication	Organisational Change	Waste Logic	e-Waste Logic	Role of WEEE Policy
<i>Periodisation (RSME)</i>	Reinventing themselves	Common Market	Triple bottom	Confounding
<i>Managed by (RSME)</i>	Profitable partnerships	Public administration	Partnerships	Repelling
<i>Ethos (IARO)</i>	Extending services	Competitive Advantage	Managing for sustainability	Complement
<i>Governance (IARO)</i>	Sourcing computers	Legislation – waste management permits	Legislation and accreditation Waste management permits And ISO Data security accreditations	Entangled
<i>Relationship with external environment (RRC)</i>	Sourcing computers	Blindness to externality	Interdependence	Confrontation
<i>Symbolic (RRC)</i>	Sourcing funds	Means to an ends (physical waste)	Ends in itself (resource is a resource)	Fraternization