

## Exporting harm, scavenging value: transnational circuits of e-waste between Japan, China, and beyond

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By Peter Wynn Kirby and Anna Lora-Wainwright

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### Introduction

Imported waste—processed and scavenged at an unprecedented scale—has transformed contemporary China, providing a considerable amount of the pollutant resource base for China's ongoing 'economic miracle' (e.g., Tong and Wang 2012). For instance, scrap topped the list of exports from the US to China over the past decade (Alexander and Reno 2012; Minter 2013), and even the most cursory exploration of China's sprawling cities and vast hinterland reveals abundant evidence of intensive formal and informal resource-extraction, particularly in the nation's coastal zones, devouring everything from foreign automobile scrap to coat hangers. 'E-waste' (electronic discards and residues, also known as WEEE) occupies an important but ambiguous place in this shadow economy of waste-conversion. This is due to both the resource value of most e-waste imports and to how very toxic the so-called 'cooking' of mountains of discarded computers, smartphones, wiring, and appliances can be in the strikingly crude, low-tech workshops where hundreds of thousands of migrant labourers toil at such de-manufacturing in dangerous conditions. Scavenged resources circulate widely, particularly in products for export, but most of the pollution from such waste-conversion remains, thus making the ecological footprint of the '(de)manufacturing workshop to the world' exceedingly large.

This paper focuses attention on transborder flows of e-waste between Japan and China, scrutinizing channels of production, consumption, reuse, and conversion both in gleaming, high-tech facilities and in rudimentary family-run scavenging workshops. In particular, the paper uses the trade between these two nations, and elsewhere in the region, to demonstrate the current shortcomings of the Basel Convention on hazardous wastes and the challenges of instituting new regulatory and processing architectures along this politically fraught and historically sensitive East Asian social terrain. The paper then turns to the protean material flows and the makeshift configurations engendered by e-waste itself—not only pollutant when scavenged but frequently lucrative and welcome in de-manufacturing hotspots in China—and assesses the uneven geographies of the smuggled WEEE and scavenged resources in Lora-Wainwright and Kirby's fieldsite in a notorious e-waste processing node in Guangdong Province, where they conducted ethnographic fieldwork intermittently during 2012-13. Southern China furnishes a useful interpretive vantage from which to analyze the environmental justice orientation that permeates the Basel Convention—which appears differently from the scavengers' perspective—and the neoliberal economic imperative embedded in much discourse surrounding transborder trade and processing operations. The authors argue that a relatively 'neutral' ethnographic approach to e-waste furnishes significant insight into thorny issues surrounding reckonings of risk and value in varying contexts.

To this end, the authors also coin the term 'scalvaging', which seemed justified by the unlikely commonalities that they found in their ethnographic fieldwork on processing activities in a range of waste conversion sites. A composite of 'scavenging' and 'salvaging', this term offers a more neutral means of referring to a spectrum of conversion activities in

both formal and informal settings that usually at once involve hazard, extraction of value, and debatable moral edification. (See Kirby and Lora-Wainwright, introduction, this issue.)

### **‘Waste colonialism’ or a rationalized transborder market in ‘resources’?**

Since the pollution debacles that marred Japan’s postwar development, Japan has made impressive strides in improving public health in communities in the so-called Area ‘Green Archipelago’. Some major lapses aside, Japanese ministries and prefectural governments have, by and large, embraced the discourse of ‘sustainability’ in domestic waste policy, instituting a sweeping set of recycling measures (Kirby 2011).

However, transnational trade in WEEE, particularly the porous Basel treaty architecture, offered a chance to create a novel Japan-led model that suits Japanese development aims. A closer look at e-waste policy furnishes revealing insight into Japan’s efforts to finesse waste processing opportunities beyond its borders. From 2001, Japanese policymakers promulgated a comprehensive set of laws and regulations to transform waste electronics into resources. The measures demonstrate a commitment to dealing with a toxic waste stream but, as explained below, they also betray a persistent cultural logic that combines Japan’s sensitivity to resources and approach to regional politics with shrewd adaptation to the treaty architecture regulating the transborder waste trade.

The Home Appliance Recycling Law (2001) allowed consumers to return unwanted used refrigerators, televisions, washing machines, and wall-unit air conditioners to manufacturers for recycling. In turn, a 2003 amendment to the Law Regarding the Promotion of Effective Utilization of Resources required manufacturers to recycle personal computers returned to

them by consumers. These measures, in turn, created a sustained boom in 'scalvaging', Japanese-style. Under state pressure, Japan's blue-chip consumer electronics and manufacturing corporations banded together to create a loose network of high-tech processing facilities from 2001 to handle the large amount of household appliances and products collected for scalvage. One consortium led by Mitsubishi competes with the other led by Panasonic to craft innovative scalvaging methods and create efficiencies, as well as to recycle as much of the discarded items as possible.

In theory and original intention, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal restricts export of toxics from 'developed' to 'developing' countries, but the treaty is a frequently vague and contradictory document riddled with assorted loopholes and exceptions (see Lepawsky 2014; Lepawsky, this issue). To a large degree, the patchwork of Japanese waste infrastructures and protocols has adapted with characteristic nimbleness to find legal ways around the strictures of the Convention. In the past decade or so, Japanese elites<sup>1</sup> have gone further and promoted (and to some extent implemented) a bold vision of regional transborder WEEE conversion that betrays Japan's self-image as a technological leader and enlightened partner in East and Southeast Asia.

That this area is roughly congruent with the borders of Japan's frequently brutal pre-1945 colonial empire, the 'Greater East-Asia Co-Prosperity Sphere', only increases the tension surrounding these efforts. The plan bears some resemblance to the bold (and difficult to implement) EU project that seeks to harmonize, 'territorialize', and marketize exchange and conversion of WEEE in EU nations to a high standard (see Kama, this issue). Yet Japan,

lacking the tight political integration of EU nations, seeks other means to adapt to the tense and divergent political terrain of its own neighbourhood, as explained below. Japan's attempts to roll out a novel 'networking' model—in which WEEE conversion in key cities in the region could be formalized and brought into line with Japan's legal, regulatory, and technological infrastructure that has collected and processed e-waste at a high standard since the turn of the millennium—have drawn the wrath of both environmentalists and those who remember Japan's harsh militarist rule before and during WWII.

Bilateral treaties have figured prominently in Japan's policy toolkit. Starting with Singapore in 2002 and subsequent very similar agreements signed with Malaysia (2005), the Philippines (2006), and Thailand (2007), Japan negotiated secretive Economic Partnership Agreements (EPA) that dangled powerful economic incentives like preferential tariff reductions for imports from these Southeast Asian nations in Area exchange for their agreement to accept toxic wastes and other hazardous materials from Japan for processing and/or disposal. After civil society groups successfully sued in the Philippine Supreme Court for release of the undissemated language in that treaty, Japan was forced to give assurances not to export toxic waste to the Philippines nor to contravene the Constitution of the Philippines through illegal activity (see DENR 2007).

Critics quickly branded this activity 'waste colonialism' (ENS 2007) in language that evoked the imperialist horrors of Japan's occupation of these nations in the years leading up to and during World War II. Expressions of outrage from activists (e.g., IDEAL 2007) accused Japan of wanting to 'dump' its toxic waste in other countries rather than deal with the waste itself

within its own sacrosanct First-World borders. But in fact, the full scope of Japanese waste strategies went much further than most of these activists appeared to recognize.

A 2005 policy brief crafted by a state-supported Japanese think tank called the Institute for Global Environmental Strategies (IGES), in Kanagawa, sets out a plan for a constellation of rationalized and more or less extraterritorial waste-processing sites. In it, the co-authors argue that a 'networked' system of 'International Recycling Zones' could boost efficiency in both domestic and international trade in recyclables throughout East and Southeast Asia (Hashi and Mori 2005). These would entail 1) certification of responsible waste processors and traders who would face severe sanction for transgressions; 2) designated ports and industrial areas where tariff-free trade and work would take place, with soft loans available to attract willing companies; and 3) a robust manifest and tracking regime to ensure proper compliance and facilitate enforcement. The plan would allow Japan both to sidestep restrictions on transborder trade in e-waste and to approximate the regional integration of WEEE policy in the EU—steering policy in neighbouring countries without incurring a range of costs and liabilities.

Tellingly, the policy brief argues that, 'Prominent in developing countries, waste scavengers, waste traders, junk shops, and other informal sectors of recyclables trade will be transformed into a more dynamic [katsudouteki na] sector' (Hashi and Mori 2005: 5). Yet taking into account existing research into e-waste conversion hotspots in Africa, South Asia, and East and Southeast Asia, the informal smuggling, trading, and scavenging of WEEE could hardly become more 'dynamic' (see, for example, Lepawsky and Mather 2011). At issue here is control of the means of production, as well as the degree of traceable pollution,

betraying emblematic Japanese elite preference for tidy systems; iron-fisted regulation; transparency, at least for bureaucrats, regarding goods traded and services offered; near-total compliance; and presumed state benefit from taxes and investments.

With regard to EPA signatory countries specifically, this 'networking' plan still appears to be taking shape. In addition to the sensitivities surrounding implementation of the bilateral EPAs, integration between target nations falls far short of what Tokyo has envisioned. While countries like the Philippines have then long imported (ambiguously categorized) 'second-hand' EEE from Japan, such as approximately 400,000 televisions per year (e.g. Yoshida and Terazono 2010), the imports have been far more likely to end up in the informal sector when reprocessed after use, not in the gleaming integrated infrastructure Japan would like implemented.

Outside of the EPA framework, however, something very close to this proposed system soon materialized intriguingly in an agreement of 'circular economy' cooperation between Tokyo and Beijing on 7 May 2008, overseen by Chinese President Hu Jintao and Japanese Prime Minister Yasuo Fukuda. Out of this meeting, the Eco-City of Kitakyushu in southern Japan forged a formal partnership with Tianjin on China's Pacific coast, which gave rise to the Ziya Circular Economy Industrial Park. Both China and Japan position scavaging activities at Ziya (where Lora- Wainwright conducted preliminary ethnographic research in 2013) as the fruit of a formalized, rationalized new extraction and commercialization regime that can Area transform the sector, but this sentiment is far from universally held, as demonstrated in a later section.

Efforts to promote transborder trade in ‘recyclables’ (shigen) reached a bizarre new level in the Ministry of the Environment’s publication of a manga eco-pamphlet that appropriates the artistic vocabulary of the legendary Japanese ukiyo-e artist Hokusai (1760-1849), released exactly two months after the above Kitakyushu agreement with China (MOE 2008). Entitled ‘A Sound Material-Cycle Society through the Eyes of Hokusai’, the manga uses imagery like the iconic ‘The Great Wave Off Kanagawa’ woodblock print (ca. 1820s)—showing Mount Fuji just discernible between the painting’s famous crested waves of mutability—and fictionalized ‘Hokusai’ commentary to argue for sustainability inspired by ‘traditional’ lifestyles like the artist’s own:

Conventional socioeconomic activities are also closely related to the exhaustion of natural resources, the destruction of nature, and the disruption of sound material cycles in the natural world.

[.] In light of the current situation, there is an urgent need for Japan as well as the rest of the world to establish a sound material-cycle (SMC) society based on reduced consumption of natural resources and lower environmental burdens (MOE 2008: 1).

So far so good—few environmental activists would disagree with these statements. Yet the manga screed goes on to promote transborder trade in ‘recyclables’ in East and Southeast Asia along the lines of the IGES policy brief, above.<sup>2</sup> One highly suggestive map of the region, drawn in a faintly ‘Hokusai’ manner, places a brush-painted circular arrow—the international symbol for recycling—over each country in the region with which Japan had been negotiating EPAs (including tariff-free trade in hazardous wastes), with the symbol

appearing over China as well. As the Hokusai-style waste manga explains, 'Circulative resources are utilized in a way that takes advantage of each country's unique characteristics. Japan uses circulative resources that require advanced recycling technologies and are therefore difficult to recycle in other countries.' (MOE 2008: 13). With echoes of Japanese elites' long-standing paternalist ambition to influence and 'lead' other countries in the region, the waste manga suggests with polite reserve, 'It seems that Japan should use its experience and technologies accumulated over the years to help fast-growing Asian countries solve pressing problems' (MOE 2008: 8). Clearly, Japanese elites here promote a vision of transborder scavaging of WEEE that would bring transfer of 'resources' in a manner that would satisfy Japanese ideas of order, control, and accountability, not to mention convenience and profit.

To be sure, Tianjin is no early-twentieth-century 'treaty port' signed over to colonialist interlopers for exploitation (c.f., Marinelli 2009), and Japanese motivations and perspectives on the development and future of the transborder waste sector differ markedly from those of other stakeholders. For instance, Chinese concerns over control of the lucrative and fiercely independent and scofflaw informal scavaging sector, as well as access to resources and international markets, shape the Chinese approach to creating a robust formal sector, with Japanese cooperation and input. Indeed, the contested geographies of Chinese 'Special Economic Zones' and other official neoliberal outposts of market-reform and transborder trade on the one hand and parlous scavaging communities metastasizing along China's coastline on the other hand lead to regulatory and bureaucratic frictions that continue to chafe frontline communities like Treasure Town, as explained in the concluding section below.

A large Sino-Japanese market in resource recovery exists, involving other countries in the region as well. For example, 1.35 million tons of waste plastic from Japan arrived in China in 2009 (Meng and Yoshida 2012), just a year after the aforementioned Kitakyushu agreement. A robust trade in counterfeit components Area derived from WEEE thrives as well, as manifested conspicuously during the authors' China fieldwork. (High-tech Japanese products are the counterfeiters' preferred choice.) Metallic e-waste presents a trickier proposition because its processing usually proves far more labour-intensive and miasmatic. This is why Panasonic's state-of-the-art PETEC facility, and peer facilities, represent an effort to 'lead' regional states toward more 'modern' scavaging development in a manner recalling the discourse of imperial relations with East and Southeast Asia until 1945—a discursive approach that has continued, under different guises in the postwar period, through dam-building initiatives abroad, overseas development assistance (ODA), and nuclear energy salesmanship (Sato 2007; Dinmore 2006; Dinmore 2013), initiatives that reach surprisingly close to the present-day.

### **'Treasure hunting' and technology transfer**

In a remote area of Hyogo Prefecture, northwest of Osaka, lies the sleek PETEC facility, whose operations unfold under a banner proclaiming the benefits of 'treasure hunting', i.e., scavaging. The quick human dismantling of televisions with the help of conveyor belts, the mechanized aids, the tooth-studded wheels of a huge vertical wringer that crushes Sumo-wrestler-sized refrigerators within seconds, and most importantly, the clever methods to sort materials quickly to put 'like with like', bespeak an efficient and capable operation.

Press releases and media stories about PETEC that adorn the facility's walls emphasize the green credentials of this sector and the rationalization of such usually pollutant processing (The Guardian 2012, January 17), and Panasonic have done a great deal to provide for worker safety. Yet however laudable it is to isolate toxic fumes from workstations and dispose of dangerous liquids in a stable manner, one thing became clear during the authors' 2013 visit—nearly all of the processes in PETEC were only designed to convert WEEE into 'non-WEEE'. The non-WEEE could then be exported legally vis-à-vis the Basel Convention. For example, televisions' vexatious glass cathode-ray tubes (CRTs), which contain large amounts of lead, were not reduced to glass on the one hand and lead on the other. Instead, PETEC scavaging yielded pebbles of leaded glass, now a 'resource' to be sold to Chinese concerns and others. Printed circuit boards did not end up converted to sanitized pellets of precious metal but instead were tossed in a bin for processing elsewhere<sup>3</sup>. Without a doubt, these components are valuable commodities outside of Japan and legally traded—but their eventual processing abroad, sometimes in non-Annex VII 'developing' nations, demonstrates both the sieve-like nature of the present Basel Convention and the pervasive hardnosed market orientation of the putatively 'eco' WEEE sector. If Japanese interests can expand the 'networked' transborder trade and conversion in e-waste, it is likely that further recovery and efficiencies could be achieved. Nevertheless, the present shade of green of Japanese scavaging is rather pale here, even sclerotic.

Multinational corporations like Panasonic and Mitsubishi have numerous subsidiaries located in countries like China, and PETEC executives explained in interview that one important aim of PETEC operations was, in time, to channel as much scavaged material as directly as possible into successive incarnations of Panasonic products frequently

manufactured in such overseas subsidiaries. (A PETEC executive informed us that up to 20% of scavaged resources are inputted directly into global Panasonic manufacturing processes.) Much of this invocation of 'zero-emissions' discourse and intensive processing rationalization derives from a long-standing cultural logic of scarcity in Japan. Elite fixation on the idea of Japan as a 'small nation, poor in resources' (e.g., Dinmore 2006) dates from industrialization and militarization drives in the early twentieth century (Sato 2007). Though contemporary harnessing of the biogas emanating from raw garbage, landfill, and Area land-reclamation sites; squeezing of BTUs from biomass sources like paper-pulp 'black liquor'; or 'thermal recycling' by generating electricity from a vast network of incinerator complexes may only partially offset the public expense of waste collection, recycling, and building and maintaining a vast high-tech waste infrastructure, this kind of top-down, policy-driven thrift regarding the husbanding of resources appeals to Japanese bureaucrats and Japanese communities alike, for the most part (Kirby 2011). Transborder leveraging of WEEE scavaging is at least in part a means to formalize and marketize the export of e-waste and to drive commissions for top-of-the-line Japanese processing technology; but its framing in the discourse of resources allows it to be achieved more easily in Japan, not to mention abroad.

Ironically, the grand project of 'networking' the operations of designated 'International Recycling Zones' has progressed far more in China without a bilateral EPA treaty than in the array of Southeast Asian nations that became embroiled in controversy over allegedly 'neo-colonial' waste policy. Fulfilling at once the longstanding Japanese aim of state-of-the-art technology transfer to regional states and the goal of cultivating a transborder market in 'recyclables', Panasonic's PETEC and other collaborators like Sumitomo are closely involved

in the construction-in-progress of a PETEC-like facility near Shanghai called Panasonic DADI DOWA Summit Recycling Hangzhou Co., Ltd. Yet it would be misleading to conclude that the new Hangzhou facility is the fruit of a devious Japanese stratagem to impose its scavaging vision on China. For these developments play very much into the Chinese government's concern with scavaging, high-tech development, state control, and (to a degree) public health and/or media concerns that directly impact the fortunes of informal operations, entrepreneurs, and workers in the infamous scavaging hotspot of Treasure Town, in Guangdong Province.

### **Imposing formality on China's dynamic informal sector**

There [in developed nations] labour is too expensive, they make no profit from this, so they send it to other countries. But these things for us are a treasure (bao)" (Boss F P 88 I20-2)

To get a clear sense of the distortions of the e-waste trade and the shortcomings of the Basel Convention, one has only to visit a major scavenging community in China. Treasure Town, the world's most notorious scavaging hotspot, has a population of roughly 150,000 people, over 100,000 of them migrant workers from other parts of China. More than 80% of local families are involved in e-waste businesses. Although reliable statistical data on e-waste imports are virtually non-existent in China due to their murky legal status (Tong and Wang 2012), over 5000 family workshops process more than 20 million tonnes of e-waste per year (Chi et al. 2011)—the enormous volume alone demonstrating how far the Convention falls short in curtailing transborder trade in WEEE. The figure includes a growing

mass of domestically produced WEEE in a swiftly developing nation, but Treasure Town sprang out of decades of e-waste smuggling in defiance of both Basel strictures and (increasingly firm) Chinese law. The current government line condemns informal workers as obstacles to sustainable development, out of step with China's current scientific development model and new e-waste management regimes that exalt large-scale processing in formal plants. These more formalised, technologically advanced enterprises are, in turn, presented as vital to ameliorating pollution (Xue et al. 2013, Yang et al. 2008). Nevertheless, informal e-waste scavaging in Treasure Town continues in defiance of these measures, albeit with adjustments brought on by the 2007 financial crisis (see Lora-Wainwright [under review]).

Treasure Town is, indeed, a city-sized rebuttal to the aforementioned claim of Area the IGES policy brief that formalization of WEEE scavaging would increase 'dynamism' in the sector. In fact, China's formal 'circular economy industrial parks' benefit from important subsidies even as they perform relatively sluggish collection of e-waste (unlike the informal outfits) and display a comparative lack of dynamism in the scavaging of WEEE.

Of course, the energetic small-scale industrial activity in such a global-scale e-waste hub as Treasure Town has yielded not just profit but extreme environmental contamination and health impacts, many of which became clear during Lora-Wainwright and Kirby's ethnographic fieldwork there and in surrounding environs. Workers have long poured primitive acid baths, toxic ash, and other perilous waste directly into blighted local waterways in Treasure Town, so that riverbanks there appear as if painted thickly with tar. Many residents who drank contaminated municipal tap water suffered an epidemic of

extreme tooth deterioration, triggering an upsurge of dental clinics in the centre of town. (The municipality now pipes in potable drinking water from 40 kilometres away.) Domestic and international media scrutiny of toxic waste problems in Treasure Town—for example the catastrophic lead poisoning of children and country-leading dioxin contamination there (see Huo et al 2007)—has prompted extensive local discourse over the relative ‘cleanliness’ of certain activities (such as the cutting and sorting of plastic) compared to others (e.g., precious-metal extraction), the morality of scavaging, and finger-pointing at other forms of litter (poorly disposed diapers that attract vermin!) and pollution (such as chemical dye effluent from textile production in a neighbouring community).

One of the biggest targets for grumbling and accusations in Treasure Town is, however, the same ‘formal’ sector that Chinese leaders believe will rationalize and clean up the nation’s scavaging operations. Though there have been plans for a circular economy industrial park (MEP 2012; Zhang 2009: 984), one is not yet in operation, nor did locals think such a setup would ever work. For their part, they are reluctant to see it happen. And as many remarked in interview, ‘they will charge people rent, so why would anyone join?’

Locals’ experience with large plants locally (both e-waste processing plants and other industries) suggested that they are not necessarily cleaner, either<sup>4</sup>. Uncle Zhang, a local man in his forties, who previously ran a small plastic processing operation, pointed out: ‘Large plants secretly emit polluted air and water (toupai) too. It’s very easy: if you pay, you can pollute’. These complaints go to the core of a linked alternative discourse, which questions whether the local government itself actually wanted to decrease pollution. Capacitor recycler, Ma, explained: ‘Environmental protection of course needs the government, but

now the government only takes money. They need to manage/control (guanli) but if you have money for them they let you go, they just want your money. Local government is all like this.. Local officials most of all think of themselves'. Lindi, a CD-drive recycler in his early twenties, offered a very clear account of what he saw as the rationale behind the town's Environmental Protection Bureau work: 'EPB officials say they want you to stop, they imprison people and fine them, but actually they hope you can keep polluting so they'll keep earning money from fines'.

The same scepticism was targeted at local government's clean up initiatives. Immediately after a damning report was aired on state television in June 2013, Lora- Wainwright during fieldwork noticed a digger extracting sludge from the local stream (which had long ago turned putrid and stagnant) for several days. Uncle Zhang interpreted it as 'face work' – making visible efforts to tackle pollution with the aim of cleaning up the locality's reputation rather than the pollution itself. He added that this was common practice. 'When higher government officials come to inspect, the local government clean up the roadside, they make it pretty (piaopiaoliangliang), they plant some flowers, they only show them the clean parts. But nothing changes, it's all a con (pian ren de)'. Similarly, he alleged that plans for circular economy parks are only excuses for the local government to earn money from land sales, and that they would not enforce any environmental protection regulations. When Anna showed him Area a pamphlet from the Ziya circular economy industrial park, near Tianjin, he sniggered and shook his head, laughing bitterly at the language: 'They said the same things here, I can't stand it (kanbuguan)—it's not going to happen'. His reaction to a pamphlet about the PETEC plant in Japan, visited the previous month, was markedly different. 'I believe it could work there'. His jarring reactions to similar projects in China and

in Japan highlight that he is not opposed in principle to circular economy parks, but rather believes that local government (and local people) would be unwilling or unable to make them succeed. The scepticism over the government's motives underlies locals' refusal to comply with regulations.

Despite the pressure from the government and the deepening prospect of competition from formal scavaging operations, enough Treasure Town entrepreneurs seem to be able to weather the difficult patches and changes in regulatory climate and enforcement. One of the more interesting of these involves what could ironically be called a more literal form of 'treasure hunting' alongside PETEC's extensive invocation of this trope. There was a time in Treasure Town when scavagers discarded circuit boards as worthless, burying large numbers of them around the township. In recent lean years, entrepreneurs have exploited these newly scavageable troves of precious metal in dumpsites. Linge, who recycles circuit boards, explained, 'Now people are digging them up, you can sell a ton for a thousand yuan'. New property buyers have discovered large numbers of circuit boards buried on their land and have made small fortunes selling them on. The 52.2 square kilometers of Treasure Town appear to hold far more such toxic caches that may continue to help sustain operations there in leaner times

## **Conclusions**

This article scrutinizes the rival geographies of the e-waste trade, with comparatively miasmatic informal processing on the one hand competing against networked special economic zones and formalized nodes of investment and preferential official treatment on the other. The e-waste trade looks fundamentally different from the perspective of

scavenging nodes in Southern China, as this article demonstrates. Furthermore, 'high-tech' formal processing is not a panacea, as Chinese findings indicate. In the past, Special Economic Zones have facilitated manufacturing and product-driven import-export commerce, but the spread of constellation-like transborder 'circular economy' industrial infrastructure constitutes a new frontier of the shadow economy of intricate waste inputs and feedback loops that help drive resource access and value extraction. Such processing corridors are emblematic of a prevalent form of multinational and neoliberal capitalist trade that, along the way, allows high-tech processing facilities in Japan and elsewhere to transform WEEE into 'non-WEEE' with relative ease for subsequent transborder trade, a striking finding (presented above) that undermines much of the triumphalist 'green' rhetoric promoting the formal recycling sector. In this way, transborder trade and the scavaging sector in countries like China and Japan expose the Basel Convention as a clumsy anachronism, facilitating all manner of problematic export of hazardous waste it was putatively designed to prevent. Yet scrutinizing how nations like Japan exploit (and speak about, and justify) these loopholes adds a relatively underexamined register of analysis that can provide insights into political motives, cultural dispositions, and internal pressures of great significance to the study of licit and illicit waste flows in an increasingly post-Basel world. The authors' relatively neutral ethnographic approach to the study of the miasmatic transborder e-waste sector helps identify the pollutant nature of even much formalized processing and serves as a partial corrective to more selective or slanted investigations of the WEEE trade, indeed airing the voices of those actually involved in processing operations to Area help convey the murky ethical contours of e-waste conversion as lived in highly sensitive smuggling and scavenging communities.

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## Notes

1 As Dinmore (2006) explains, policy boosters in the transwar period—and more recently—would include politicians, bureaucrats, corporate figures, writers/academics, and high-ranking members of quasi-governmental organizations who might retire from other posts.

2 Kirby made several attempts, by email and phone, to confer with IGES in 2014, with no substantive response.

3 Panasonic relies on brokers who act as middlemen for buyers. Likely scavaging destinations range from the industry-leading Umicore, headquartered in Belgium, to

numerous less savoury customers, fluctuating with regard to price, volume, and other factors.

4 The material here on PETEC and Chinese counterparts therefore provides a counterbalance of sorts to the 'industrial symbiosis' scholarship that largely promotes eco-industrial parks in a range of settings (e.g. Chen et al. 2012, Zhu et al. 2007, Chertow et al. 2008).