TOXICITY EXPOSED IN THE GREENPEACE TOXIC TECH CAMPAIGN[1]

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Abstract – This paper presents the findings of the analyses of the *Green Gadgets Report* (GGR) and of the *Guide to Greener Electronics* (GGE), the two main documents whereby Greenpeace has been disseminating the findings of the scientific investigations carried out in the context of the Toxic Tech campaign. The study draws on quantitative and qualitative research methods, including Corpus Linguistics, Pragma-dialectics and Multimodal Discourse Analysis, to describe the discursive features of these two texts and examine the knowledge-dissemination strategies used by Greenpeace to expose the toxicity of the tech industry and persuade consumers to consider issues of environmental ethics and health while purchasing their technological devices. The findings suggest that while the GGR lays out the results of a fully-fledged scientific investigation and flaunts certain features of scientific discourse, the GGE is a significantly simpler and totally unscientific document, aimed at disseminating scientific results to a wider, less specialised audience. Certain features not typical of specialised communication (including the use of generalising expressions and the stereotypical recourse to problem-solving argumentation patterns) can also be found in the hybrid GGR, but the GGE appears to rephrase and simplify scientific data in order to recontextualise the environmental and health crisis caused by the tech industry in the sports sphere. The choice to publish these two different texts, one more argumentative and scientific, the other more persuasive and entertaining, thus, appears to be functional to the dissemination of knowledge on a wide scale. By tapping into elements of specialised discourse and visual arguments alike, the Toxic Tech campaign results in a multi-genre discourse, addressing different audiences at the same time and maximising the reach of scientific discoveries by turning them into entertaining sports events.

Keywords: argumentative pattern; GGE; GGR; Greenpeace; knowledge dissemination.

> *The inventor looks upon the world and is*
> *not contented with things as they are. He*
> *wants to improve whatever he sees, he wants*
> *to benefit the world.* (Alexander Graham Bell)

*L*ingue e
*L*inguaggi

1. Introduction

While striving to invent and rushing to patent the telephone, Alexander Graham Bell did not probably imagine that his invention would become a problem; more than a century later, the rate at which mobile telephones and, in general, all electronic devices are purchased and discarded is triggering a series of adverse repercussions on the environment. The consumption of electronic equipment continues to grow, "with ever-shorter replacement cycles based on the latest trend or model multiplying the life-cycle impact" of smartphones, tablets, PCs and TVs, from their assembly to their becoming e-waste (Greenpeace 2014, pp. 5-6). Environmental risks are particularly rife in the production and disposal phases. Greenhouse gas emissions during product manufacture remain considerable despite reductions in emissions per device produced, especially because coal power still dominates production in developing countries, thereby exacerbating climate change (Greenpeace 2014, p. 7). Moreover, large quantities of toxic chemicals are still used in the manufacturing phase. These substances, including polyvinyl chloride and brominated flame retardants, remain in discarded e-waste for years. Although electronic take-back programmes are growing, the speed of collection cannot keep pace with the rate of consumption and the recycling of e-products remains problematic, as e-waste is often exported to countries in the Global South where rampant backyard recycling poses serious health risks to the local communities (Greenpeace 2014, p. 5).

The rapid worldwide growth in the consumption of electronic devices is, thus, multiplying the environmental and health problems posed by a thriving industry which is still based on an unsustainable model. In spite of its gravity, the issue is not echoed in the news media, and NGOs seem to be the only subjects struggling to inform the wider public and influence consumer trends in an Orwellian world where the sole idea of questioning the tech industry is unbearable to many. Particularly, Greenpeace has been consistently calling for a revolution in the electronics industry, one that can "ensure a toxic-free future, protect the health of its workers, and prevent environmental pollution" (Greenpeace 2014, p. 8). At the beginning of the century, the NGO launched the Toxic Tech campaign with the aim to expose the presence of toxic chemicals in a variety of electronic devices. Since 2006, it has published and updated its *Guide to Greener Electronics*, whereby a number of leading consumer electronics companies have been assessed and ranked based on their commitments to address their environmental impacts. Coupled with the Guide, more detailed reports (Greenpeace 2008, 2014) have been published to foster the scientific debate on toxic technology and drive corporate and institutional change.

The whole Toxic Tech campaign is, therefore, closely related to

Corporate Social Responsibility (Catenaccio 2012); it raises bioethical questions revolving around the sub-topics of environmental ethics (Post 2004, p. 757) and environmental health (Post 2004, p. 776) and falling under the broader thematic category of "our duties to nature" (Talbot 2012, p. 393). Notably, the Greenpeace campaign inevitably deals with relatively complex notions pertaining to environmental toxicology and chemistry; consequently, it addresses an expert audience and aims at nurturing a specialised debate on the issue, but it also speaks to a more vast and varied public of consumers in an attempt to lead them to revise their tech purchases, strongly influenced by mainstream media and advertising. In this respect, the Toxic Tech campaign provides invaluable research material to analyse the strategies of adaptation to audience demand (van Eemeren 2010, p. 108) implemented to disseminate scientific knowledge and enact counter-persuasion in the era of consumerism; by examining the documents issued in the context of the Toxic Tech campaign, this paper investigates the knowledge-dissemination strategies (Bondi *et al.* 2015; Garzone 2006) whereby Greenpeace has been blazing the path to greener electronics. This case study, which also provides a contribution to the study of activist discourse (Brunner, DeLuca 2017), has been conducted with a view to providing answers to the following research questions: to what genre do activist reports belong or seem to belong? What are the discursive means whereby scientific discoveries are popularised and recontextualised in the activist context?

2. Material and methodology

The present paper focuses on the analyses of the *Green Gadgets Report* (GGR) (Greenpeace 2014) and of the *Guide to Greener Electronics 18* (GGE) (Greenpeace 2012), the two crucial documents making up the Greenpeace knowledge-dissemination effort in the context of the Toxic Tech campaign.

Since activist campaigns "find in the Web their privileged site of discourse" (Degano 2017, p. 292), both documents are accessible from the official website of Greenpeace;[2] as a consequence, their reach is magnified by the Web, extending beyond the limits of the campaign itself (Degano 2017, p.

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[2] The GGR and the GGE are respectively available at https://www.greenpeace.org/usa/wp-content/uploads/2015/07/Green-Gadgets.pdf and https://www.greenpeace.org/archive-new-zealand/en/Guide-to-Greener-Electronics/18th-Edition/, last accessed on November 5th, 2019. The documents, downloadable from the American and New Zealand pages of the environmental NGO, are no longer available on the website of *Greenpeace International* (www.greenpeace.org/international), but were when this paper was first written at the beginning of 2018.

291) and rendering any attempt to identify specific audiences vain. Despite their digital, online and popularising nature, however, the two documents remain fundamentally different; while the GGR lays out the results of a fully-fledged scientific investigation and flaunts certain features of scientific discourse, the GGE is a significantly simpler and totally unscientific document. In other words, while the former addresses and popularises notions of environmental toxicology and chemistry, thereby restricting its audience to those who have at least a slight familiarity with the subject, the latter is the result of a more significant popularisation effort (Garzone 2006, p. 11) aimed at disseminating scientific results to a wider, less specialised audience.

The exploration of the Toxic Tech discourse conducted in this paper has drawn on quantitative and qualitative research methods in an attempt to describe the features of the GGR and the GGE and categorise these two different activist reports, which do not apparently pertain to any codified genre. Corpus linguistics has offered an aid to qualitative analysis (Garzone, Santulli 2004, p. 351), as the *AntConc* software (Anthony 2009, p. 95) has been used for word count and the identification of keywords (Culpeper, Demmen 2015, p. 90) in the texts. Regarding qualitative research methods, Pragma-dialectics (van Eemeren, Grootendorst 1984) has provided the theoretical foundations to investigate Greenpeace's argumentative endeavours to persuade a vast audience of more or less sensitive consumers to consider issues of environmental ethics while purchasing their technological devices. In particular, the study has focused on the identification of stereotypical and prototypical argumentative patterns (van Eemeren 2017, pp. 19-22), i.e. those that are recurrent and characteristic of the communicative activity type in which they occur.

In addition, the pragma-dialectical approach to the analysis of the GGR and the GGE has been supplemented with insights drawn from Multimodal Discourse Analysis (Kress, van Leeuwen 2006), because Greenpeace taps into different semiotic resources (visual and verbal) to convey meaning (Brunner, DeLuca 2017). In particular, the following sections will illustrate that the green principles that are expressed by means of verbal arguments are regularly re-expressed (especially in the GGE) by means of visual arguments (Degano 2017), set forth "through the choice between different uses of colour or different compositional structures" (Kress, van Leeuwen 2006, p. 2). As Kress and van Leeuwen (2006) suggest, the decision to advance argumentation both verbally and visually affects meaning and results in a complex, more convincing and sophisticated argumentation structure (van Eemeren 2017, p. 25), which is specifically tailored to expose the flaws of an apparently flawless industry and influence the behaviour of its apparently faithful customers.

3. The Green Gadgets Report

Published in 2014 and downloadable from Greenpeace's website as a pdf file, the *Green Gadgets Report* (GGR) presents itself as an extensive and relatively complex text. The following excerpt, where the risk posed by the presence of beryllium and beryllium compounds in electronic devices is addressed, is a case in point:

> (1) *Beryllium* and *beryllium compounds*, when released as dusts or fumes during processing and recycling, are recognised as known human carcinogens. Exposure to these chemicals, even at very low levels and for short periods of time, can cause beryllium sensitisation that can lead to *chronic beryllium disease (CBD)*, an incurable and debilitating lung disease.

This excerpt, indicative of the discursive orientation of the whole report, shows that the GGR appears as a hybrid genre, characterised by scientific topicality but also by a high degree of readability for a wide and heterogeneous audience. Although scientific denominations are used (*chronic beryllium disease*), explanations often follow to help the reader understand the topics addressed (*an incurable and debilitating lung disease*). In other words, specialised lexicon occurs in the report, where lexical items such as *hormone disrupters*, *endocrine disruptors (ED)*, *dioxin*, *antimony trioxide*, *phthalate* can be found; yet these lexical items are generally explained in lay terms. For instance, the reprotoxic nature of some phthalates is codified by resorting to the expression "toxic to reproduction", immediately followed by the term *hormone disrupters* which confers scientificity upon the text.

> (2) Some [phtalates] are classified as *"toxic to reproduction"* and are known to be *hormone disrupters*.

The GGR is, therefore, a popularising text that shares some features with scientific texts. Notably, it also heavily resorts to acronyms, that contribute to meeting the requirements of economy of expression typical of specialised communication (Garzone 2006, p. 33).

> (3) Apple is the only company that has eliminated the use of *PVC* and *BFRs* in all PC components, including external cables.

> (4) Nokia achieves its goal to phase out *BFRs*, *CFRs* and *antimony trioxide* in all new products.

> (5) Currently, no TVs on the market are completely free from *PVC* and *BFRs*.

As the above examples suggest, the most frequently recurring acronyms are *PVC* and *BFR*, standing respectively for *polyvinyl chloride* and *brominated*

flame retardants. Curiously, these noun phrases almost never occur in the report. Only 4 and 7 occurrences of, respectively, *polyvinyl chloride* and *brominated flame retardants* can be observed, as opposed to 234 of *PVC* and 196 of *BFR*. If the higher number of occurrences of acronyms could be seen as functional to avoiding the repetition of longer noun phrases, it is vital to specify that the abbreviated forms first occur without their expansions or explanations, which crop up later in the text; thus, acronyms remain "totally opaque", "impenetrable for anyone who is not already familiar with their meanings" (Garzone 2006, p. 33), at least until their expanded forms occur.

In addition, the GGR also relies on schematisation procedures, i.e. "the marked tendency – common to all types of scientific and technical texts – to make recourse to charts, diagrams, tables, schemes series and lists" (Garzone 2006, p. 68).

Despite the presence of charts (e.g. Greenpeace 2014, p. 16), tables (e.g. Greenpeace 2014, p. 14), specialised lexicon and acronyms, however, the GGR cannot be labelled as a scientific text. Notably, photographs (e.g. showing piles of e-waste or recycling workers in the Third World) render it more similar to a magazine article. Furthermore, the text does not follow the general IMRAD (Introduction, Methodology, Results and Discussion) pattern or structure (Garzone 2006, p. 41) characterising research papers but is, instead, more freely organised. An executive summary (Greenpeace 2014, pp. 5-8) is followed by the "Greener Electronics Campaign Timeline" (Greenpeace 2014, pp. 10-11), the outcome of another schematisation procedure aimed at displaying the progress made in the campaign from 2005 to 2012. The content of the report is, then, divided into thematic sections and summarised in a brief conclusion (Greenpeace 2014, p. 37). If the presence of an extensive bibliographical section at the end of the report gives it the appearance of a scientific paper, another remark concerning the non-scientificity of the GGR should be made. In this text, Greenpeace's need to reach different audiences with different degrees of preparation often results in marked generalisations, not typical of scientific discourse. For example, in (6)

> (6) Other examples of hazardous chemicals commonly used in electronics also pose *a range of environmental and human health problems* […] Antimony trioxide is recognised as a possible human carcinogen; exposure to high levels in the workplace, as dusts or fumes, can lead to *severe skin problems and other health effects*.

the indication of vague *skin problems* (however *severe*) and the use of the generalising expression *other health effects* appear like linguistic items that are not typical of an appropriate, precise and referential form of specialised communication. The *range of environmental and human health problems*

posed by toxic substances are, more often than not, only mentioned rather than discussed in depth.

Moreover, if it is true that scientific texts do resort to well-calculated rhetorical effects and go beyond pure referentiality and informativeness (Garzone 2006, p. 38), it is also true that, in the GGR, persuasive strategies are enacted by discursive means not typical of scientific texts. First, the occasional use of metaphors stands out. For instance, recycling workers are said to be "exposed to a *cocktail* of toxic chemicals and by-products" (Greenpeace 2014, p. 13) and phthalates are described as "softeners for PVC" that "*migrate out of* plastics over time" (Greenpeace 2014, p. 13). However colourful and evocative, these occasional metaphors, coupled with the various generalising passages, often point to the hybridity of the genre in question. Second, and more broadly, an overall discursive strategy aiming at the deconstruction of complexity can be identified in the GGR, further corroborating the "partially scientific" nature of the document: the recourse to the simple argumentative pattern problem-solution (Bortoluzzi 2010, p. 167) stands out, whereby the reality seems to be simplified by stating that there is only one problem requiring one specific solution. In the context of the Toxic Tech discourse, the description of the various environmental and health problems connected to the production and disposal of electronic devices (Greenpeace 2014, pp. 5-7), which have been outlined in section 1, serves the purpose of laying the groundwork for arguing for a green solution. In this respect, argumentation hinges on the *topos of threat*, positing that "if specific dangers or threats are identified, one should do something about them" (Wodak 2009, p. 44). Yet, this premise of argumentation is mainly and most often conjured up by the informal, non-technical adjective *hazardous* (examples 7 and 8), occurring 136 times to trigger the problem-solution pattern that characterises argumentation in the GGR. Other more specific (albeit non-technical) adjectives, such as *toxic* (30 occurrences), show up far less frequently.

> (7) Large quantities of *hazardous* PVC are still used in electric cables for PCs and TVs in particular.

> (8) The *elimination* of *hazardous* substances from the products themselves is the first step in addressing the wider *problem* of *hazardous* substance use across the supply chain.

Coupled with the occasional presence of the noun *problem* and the adjective *problematic* (13 and 2 occurrences, respectively), the reiteration of the adjective *hazardous* conjures up the idea of a predicament that needs to be tackled. As suggested by example (8), the noun *elimination* and the verb *to eliminate* are often used to shed light on how the problem of hazardous

chemicals should be solved; taken together, the noun and the inflected forms of the verb occur 66 times. Yet, the identification of the solution mainly relies on the iteration of the verb *to phase out*, occurring 92 times and pointing to the need of getting rid of all the toxic substances from electronic devices.

> (9) HP now is making progress but has failed to completely *phase out* the worst hazardous substances from all products.

> (10) Dell continues to delay in *phasing out* PVC and BFRs.

> (11) Samsung is penalised for missing its deadline to *phase out* BFRs.

> (12) Toshiba is penalised for missing its *phase-out* deadline along with Samsung.

In the light of the recurring character of the lexical items pointing to a problematic situation and a proposed solution (examples from 7 to 12), argumentation in favour of detoxification in the GGR can be said to hinge on a specific version of pragmatic problem-solving argumentation (Garssen 2017, p. 35) that is prototypical of activist discourse (Brambilla 2019). It is the argumentative pattern of complex problem-solving argumentation, whereby "it is first established that there *is* a problem in the current situation, because it is not automatically accepted by the audience" (Garssen 2017, p. 36). In consideration of the lexical pillars of argumentation in the GGR, the discursive implementation of this pattern in Greenpeace's Toxic Tech campaign can be represented as follows:

1. Standpoint: The hazardous chemicals used in the tech industry should be eliminated/phased out
    1.1a Because: There are environmental and health problems connected to the production and disposal of electronic devices
    1.1b Because: The elimination of these hazardous chemicals will solve the environmental and health problems connected to the production and disposal of electronic devices
    (1.1')(And: If there are problems connected to the production and disposal of electronic devices and the elimination of these hazardous chemicals solves these problems, hazardous chemicals should be eliminated/phased out)

The problem statement 1.1a is complex, because it has a descriptive and a normative component (Garssen 2017, p. 37). In pragma-dialectical terms, it is composed of what Garssen (2017, p. 37) calls an *existential presupposition*, i.e. a premise expressed by means of an existential structure, and a *normative qualification*. In other words, through this basic pattern, Greenpeace defends the premise that an environmental and health crisis exists and that it is troublesome. In so doing, the NGO defends the standpoint that the

elimination of the hazardous chemicals used by consumer electronics companies leads to a green and, therefore, desirable result.

Notably, the excerpts from (7) to (12) have been selected in that they highlight the iteration of the nouns and verbs that enable the reconstruction of argumentation in the GGR, but examples (11) and (12) have also been displayed because they reveal other non-casual lexical items, whose presence can be said to be curious in a "scientific" report. The verb *to penalise* occurs in the passive form just 3 times in the GGR, raising a few doubts in the minds of those who are not familiar with the report in question: why are companies penalised, and by whom? What does this penalty consist of? Is it an economic sanction? These questions are exhaustively answered in the other main document released in the context of the Toxic Tech campaign, the *Guide to Greener Electronics*. The discursive features of this text are only anticipated in the *Green Gadgets Report*, where other unexpected lexical items sporadically stick out, especially in evocative section headings:

(13) Progress on hazardous chemicals: the *leaders* and *laggards* as of 2014

(14) *Backtrackers* and compromisers

The occasional references to *leaders* (6 occurrences), *laggards* (4 occurrences), *followers* (2 occurrences) and *backtrackers* (1 occurrence), triggering associations with races, speed and slowness, would be out of place (to say the least) in a scientific paper, but not in a hybrid text produced and published in activist contexts. The hybridity of the GGR is further confirmed by the presence of a table (Greenpeace 2014, pp. 38-43) condensing the information provided in the report; despite systematising the scientific results laid out in the previous pages, however, this table does not merely look like the outcome of a schematisation procedure. Introduced by the title "Which companies are phasing out PVC and BFRs?", it presents a list of the tech companies assessed, which are ordered from the more to the least sustainable. In particular, a series of coloured symbols, listed and explained in a key (Figure 1), are placed beside the names of the companies to assist the reader in interpreting the data.
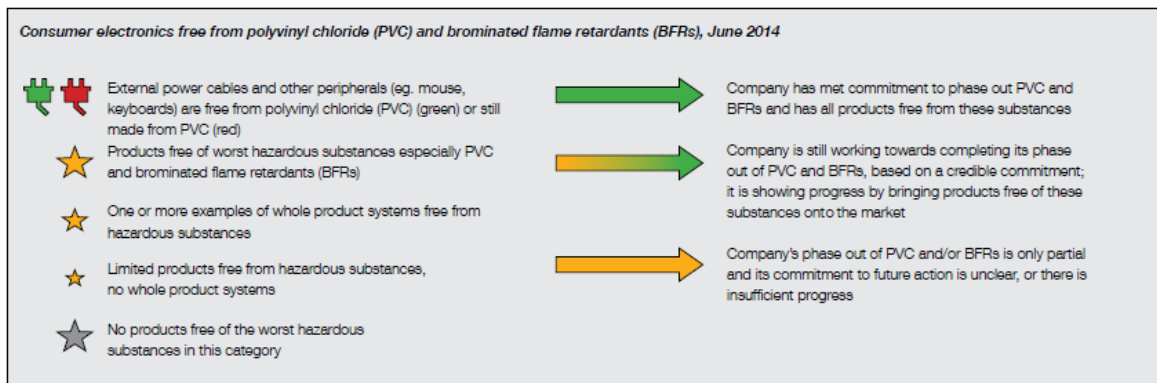
Figure 1
Key to the comprehension of the table entitled "Which companies are phasing out PVC
and BFRs?".

The information in the key clarifies that the different stylised plugs and stars (in the left portion of the key) indicate the extents to which companies use toxic chemicals in the production of their devices, while the three arrows (in the right portion of the key) refer to three different degrees of corporate commitment towards the solution of the environmental problem. Besides the choice of the symbols themselves, though, it is the choice of colours that stands out. The almost universal meanings of colours green, yellow and red will be explored and described in section 4, illustrating the discourse features of the *Guide to Greener Electronics*, where these colours are more systematically used for informative and pragmatic purposes alike. As regards the *Green Gadgets Report*, colours are used sporadically[3] and especially in the table at issue where, in combination with the plugs and the arrows, they seem to act like traffic lights to tell the reader which companies are proceeding (green), slowing down (yellow) or stopping (red) on the path to greener electronics. The colours (yellow or grey) and dimensions of the stars also contribute to specifying the brightness and scope of corporate commitment.

In the table, partially displayed in Figure 2, the logo of each company is flanked by a few of the symbols explained in the key and by a brief description of the company's progress or setbacks, which is nothing but a short summary of the data expounded in the whole GGR.

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[3] These three colours are also used discursively on page 14 of the GGR, where another table of the same type is shown, and on page 16, where five pie charts reproduce the same findings shown in the table.

Company	Mobile phones	PCs (desktop & laptop computers, monitors	Desktop monitors and other products	Televisions	Other products	Progress
Apple [86]	⭐ PVC and BFRs were eliminated from Apple products in 2008.	⭐ PVC and BFRs were eliminated from Apple products in 2008, with the exception of PVC cables, which were eliminated in 2013 (as of 2014 regulatory approval for PVC-free cables is still pending in India and South Korea).	⭐ PVC and BFRs were eliminated from Apple products in 2008, with the exception of PVC cables, which were eliminated in 2013 (as of 2014 regulatory approval for PVC-free cables is still pending in India and South Korea).			→ Apple led the way on eliminating toxic PVC and BFRs from all its new products with the new iMac and MacBook being the first PCs completely free of PVC and BFR and met its commitment to phase these substances out by the end of 2008.
HP [89]		⭐ All of HP's notebook products and 60% of the company's non-mobile product families are low halogen, as of January 31, 2014 (apart from external components such as keyboards, mice, cables, and cords are not low halogen).[90] HP's Windows tablets and hybrid/split products are also low halogen; however, lower priced Android tablets are not yet low halogen.	⭐ Examples of three HP models of monitor that are virtually free of PVC and BFRs are the HP Compaq LE19f and LA22f widescreen LCD commercial monitors and the HP 2310e LED consumer display. The HP ENVY 100 e-All-in-One is the first PVC-free printer.			→ HP needs to complete its phase-out of PVC by investing in PVC-free cables for all its computing products, and complete its phase-out of all PVC, BFRs and other hazardous substances in all its products. HP maintains that the entire industry needs to shift towards PVC-free cables to maintain a competitive playing field and is advocating with its suppliers.

Figure 2
Excerpts from the table entitled "Which companies are phasing out PVC and BFRs?".

The analysis of the verbal content of the table suggests that the ideas of competition expressed by the non-scientific lexical items that are sporadically used in the main sections of the GGR (*leaders*, *laggards*, *followers*, *backtrackers*) are also infrequently evoked in the table. For instance, the verb *to lead* is used in "Apple *led* the way on eliminating toxic PVC and BFRs", in the right column of the Apple row. Moreover, the HP row also signals the occasional presence in the table of the deontic verb *need to*, whereby Greenpeace warns tech companies against the moral risks of persevering in using hazardous chemicals. This verb, which has already been found to play an instrumental discursive role in activist communication (Brambilla 2019, p. 186), discursively presents the arguer as an authority, as Greenpeace is put in the position of assessing individual companies, judging them and instructing them on what they are required to do. The practical and moral authority of the NGO in the field of environmental ethics and health is, however, further and more skilfully constructed in the other document that is analysed in this

paper. The use of colours, the recourse to non-scientific terms evoking a competitive atmosphere and the choice of the deontic verb *need to* are significant but sporadic strategies in the hybrid GGR which, however, become pillars of Greenpeace's discourse in the totally unscientific GGE.

4. The Guide to Greener Electronics

First published in 2006, the *Guide to Greener Electronics* (GGE) reached its eighteenth edition in 2012, the year when the incessant updating process of the document came to an apparent stop. All the editions of the Guide are available on the official website of Greenpeace International,[4] showing the extent to which the changes undergone by the text have progressively streamlined its persuasive component. Indeed, while the GGR is governed by the pattern of complex problem-solving argumentation, logic immediately appears to play a minor role in the "simpler" version of the report.

> (15) This Guide is not an endorsement for buying products from one company or another. *Remember*! The most sustainable devices are the ones you don't actually buy! *Work* to extend the life of your existing electronic gadgets, *buy* used products, and only *purchase* what you truly need.

However significant, recourse to imperatives (*remember, work, buy, purchase*) is sporadic and only characterises excerpt (15), an isolated comment elucidating the nature of the text right at its outset. Although imperatives are functional to the promotion of ethical purchasing choices, the Guide remains a descriptive rather than prescriptive text. If the GGR can be considered a hybrid text sharing features with scientific discourse, the GGE can be seen as either its enthralling abstract or a riveting expansion of the table that has been described at the end of section 3 and displayed in Figure 2; in this regard, the GGE is conceived not only to summarise the contents of the *Green Gadgets Report* but also, and especially, to disseminate at the popular level (Garzone 2006, p. 11) the scientific results contained therein.

The *Guide to Greener Electronics* has been updated and modified throughout the years, but all the eighteen editions share one central theme: since its first appearance on the web, the GGE has taken on the form of a ranking, whereby selected companies are listed according to their commitments to cut greenhouse gas emissions and eliminate toxic chemicals from their products, with a view to reducing health and environmental

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[4] The editions of the Guide from the 1st to the 18th can be found at https://www.greenpeace.org/archive-international/en/campaigns/detox/electronics/Guide-to-Greener-Electronics/Previous-editions/, last accessed on November 5th, 2019.

impacts. The companies analysed are assigned points from zero to ten and listed according to the score obtained. The ranking criteria are regularly revised to account for different problematic areas of the electronics industry.

Each and every edition from the first to the seventeenth is dominated by the unambiguous heading "How the companies line up". The verb *to line up* further points out the linear arrangement of the Guide and contributes to situating the text within the boundaries of sports discourse. In this regard, the association with sports events and, broadly, competition is made explicit in the GGE, a document that overtly "helps to highlight the competitive, innovative aspects of the consumer electronics sector". This paper focuses on the eighteenth edition of the Guide, evaluating leading consumer electronics companies based on their commitment and progress in three environmental areas: *Energy*, *Products* and *Operations*. Although it is representative of the previous editions in most respects, it also shows peculiarities and significant updates that will be highlighted below.

More than in the previous editions of the GGE, the eighteenth sees the complex path to greener electronics being discursively constructed as a competition, particularly a race, in which there are *leaders* and *laggards*. By means of various discursive strategies which will be illustrated below, the sixteen companies whose performances have been analysed are either presented as "fast" or "slow", competitive or not. Although the heading "How the companies line up" ceases to dominate the webpage, the ranking-like configuration of the text remains evident. As in most previous editions, a brief account of the performance appears next to the number specifying the company position in the ranking. By clicking on the name of a company, the user is redirected to the company's *scorecard*, where few additional and slightly expanded indications on corporate achievements can be found. In these individual descriptions of company performances, the deontic verb *need to* is used (more frequently than in the GGR) to "order" all the companies to revise their polluting practices, irrespective of their positions in the ranking. Various examples could be provided, but only a couple of excerpts are displayed (16, 17) to shed light on the crucial pragmatic role that the iteration of *need to* in the Guide plays in discursively representing Greenpeace as the referee of the competition.

(16) To increase its score, Lenovo *needs to* set ambitious targets to reduce its own GHG emissions by at least 30% by 2015 for its operations and dramatically increase renewable electricity use by 2020.

(17) Toshiba aims to use renewable energy for a wider range of its operations, and *needs to* set a target to dramatically increase renewable electricity use by 2020.

The presence of the noun *scorecard* itself further suggests that all the lexical and expressive choices in the GGE are aimed at recontextualising scientific knowledge in the domain of sports. Broadly, verbs, nouns and expressions generally found in sports news and commentaries proliferate, especially the verb *to score* and, to a lesser extent, the noun *score*. Virtually absent in the GGR (where only 3 occurrences can be observed), the verb is the inescapable linguistic indicator of the fact that *points* (examples 18, 19, 20, 21) are awarded to the participants, as in all sports competitions.

> (18) Wipro […] makes its debut in the international version of Greenpeace's Guide to Greener Electronics with 7.1 *points – placing it in 1ˢᵗ position*.

> (19) HP […] has *lost* its top spot […] and now *sits in 2ⁿᵈ position*, with 5.7 *points*.

> (20) Dell *drops to 5ᵗʰ position*, with 4.6 *points*. While Dell *scores* high overall, the company *scores* poorly on all Products criteria.

> (21) Apple *drops to 6ᵗʰ position*, with a *score* of 4.6. Though one of the high *scorers* in this edition, Apple misses out on *points* for lack of transparency.

The fact that a contest is under way is rendered evident by the omnipresent indication of the positions occupied by the companies in the ranking (examples 18, 19, 20, 21). As example (19) shows, the occasional occurrences (6 in the whole text) of the verb *to lose*, used to shed light on the setbacks suffered by certain companies (namely HP, Apple, Sony, Philips, Sharp), further evoke a competitive atmosphere. Moreover, the linear nature of the GGE is further highlighted by the iteration of verbs indicating upward or downward movements, such as *to drop* (examples 20 and 21). Besides this verb, *to move up* (22) and *to fall* (23) contribute to shoring up the underlying idea of a corporate race for the top.

> (22) Nokia *moves up to 3ʳᵈ position* in this edition of the Greenpeace Guide to Greener Electronics. After three years at 1ˢᵗ position, Nokia *fell to* 3ʳᵈ in last year's edition.

> (23) Panasonic *falls back to 11ᵗʰ position* in this edition of the Greenpeace Guide to Greener Electronics, with 3.6 points.

The competitive nature of the text is enhanced by the opportunity, offered to the user, to download, from the homepage of the GGE, the *Full Scorecard*. This sixty-five-page pdf document, whose denomination further contributes to equating the path to greener electronics with a sports competition, ventures into more detailed descriptions of corporate performances, showing more similarities with the hybrid GGR than with the popular GGE. The same holds

true for another document, retrievable from the webpage of the Guide, i.e. the *Ranking Criteria Explained*,[5] which provides more exhaustive insights into the assessment procedure. In this respect, the simple GGE offers links that redirect the user to more detailed and scientific sections, in a sort of virtual route where the expert can proceed in order to acquire new knowledge and the lay person can stop without being deprived of the privilege of being duly informed. Thus, in spite of this web configuration, the GGE remains a simple text addressing an audience of non-experts in toxicology. In this regard, other crucial discursive peculiarities of the eighteenth edition of the GGE need to be addressed.

Despite the crucial role played by verbs in constructing the Toxic Tech discourse as a race, not only linguistic but also pictorial elements are instrumental in determining the discursive configuration of the Guide. A multimodal approach to the document points to the presence of an arrow next to the number that shows the position in the ranking; the symbol is used to indicate whether the company at issue has improved or worsened its performance since the previous edition of the "race", thereby contributing to guiding the reader towards the appropriate interpretation of the research findings, thoroughly described in the more scientific GGR. When companies "participate in the race" for the first time, the space reserved for the arrow is occupied by the adjective *NEW*.
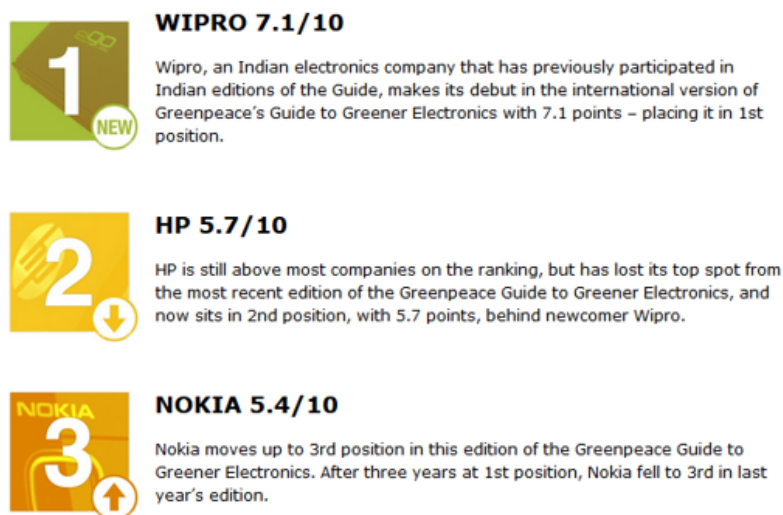
WIPRO 7.1/10

Wipro, an Indian electronics company that has previously participated in Indian editions of the Guide, makes its debut in the international version of Greenpeace's Guide to Greener Electronics with 7.1 points – placing it in 1st position.

HP 5.7/10

HP is still above most companies on the ranking, but has lost its top spot from the most recent edition of the Greenpeace Guide to Greener Electronics, and now sits in 2nd position, with 5.7 points, behind newcomer Wipro.

NOKIA 5.4/10

Nokia moves up to 3rd position in this edition of the Greenpeace Guide to Greener Electronics. After three years at 1st position, Nokia fell to 3rd in last year's edition.

Figure 3
Excerpt from the GGE.[6]

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[5] The document is available at https://www.greenpeace.org/archive-new-zealand/Global/international/publications/climate/2012/GuideGreenerElectronics/Guide-Ranking-Criteria-v18.pdf, last accessed on November 5th, 2019.

[6] The picture is available at https://www.greenpeace.org/archive-new-zealand/en/Guide-to-Greener-Electronics/18th-Edition/, last accessed on November 5th, 2019.

Besides displaying a portion of the ranking, Figure 3 reveals another discursive strategy which is implemented in the GGE: as in the table displayed at the end of the GGR (see Figure 2), specific colours are chosen and used to shore up the ideas expressed by means of language and ratified through numbers and arrows. The skilful use of colours has contributed to the creation of meaning in the GGE since the beginning of the Toxic Tech campaign, as the leaders of the ranking are regularly associated with the colour green and the laggards with red, with all the other companies sitting in the middle of the table being characterised by yellow. In Figure 3, the Wipro square is green, while the HP and Nokia squares are coloured in yellow; and this choice is not casual. Kress and van Leeuwen (2006, p. 269) highlight that "colours often have conventional meanings" and suggest reading, for instance, "green as the colour of nature". Green is, therefore, quite intuitively associated with the only committed and environmentally-friendly company while, moving down in the ranking, yellow gradually turns to red, progressively blaming the laggards and polluters in a universally comprehensible way.

Although the GGE ranking embellished with arrows and meaningful colours would probably be enough to clarify the differing situations of the competitors, another pictorial element, dominating the webpage, contributes to exposing the toxicity of the tech industry and shedding light on the performances of the various companies analysed.
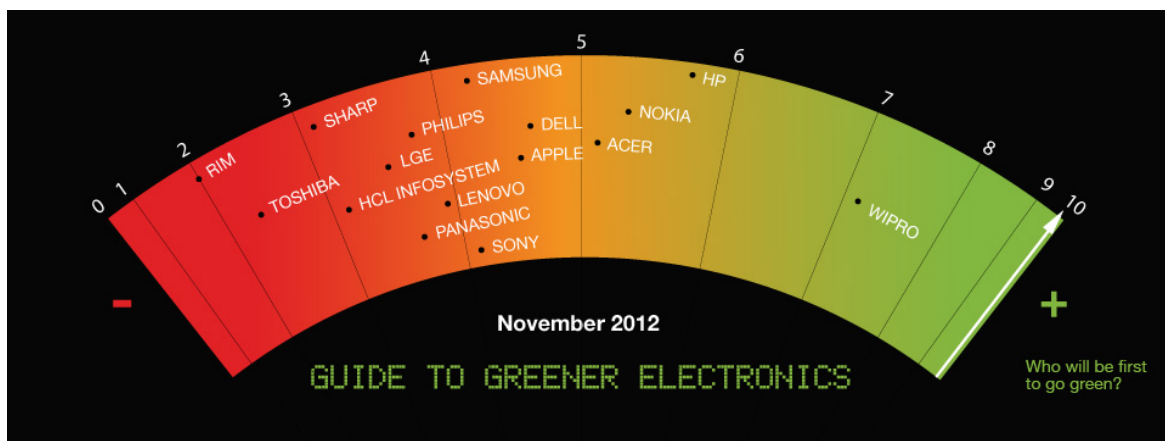

Figure 4
The GGE speedometer.[7]

The remarks on colour regarding Figure 3 also apply to Figure 4. It displays the GGE speedometer, whose left portion is coloured in red; moving to the

[7] The picture can be found at https://www.greenpeace.org/archive-new-zealand/en/Guide-to-Greener-Electronics/18th-Edition/, last accessed on November 5th, 2019.

right, red gradually turns to yellow which, in turn, progressively verges on green in the right section of the picture, thereby portraying a continuum of varying degrees of environmental responsibility.

The name of the leading company, Wipro, is placed on the right, where the indicator signals high speed in a speedometer. Wipro is the only company occupying the green part of the speedometer, while all the other companies are lagging behind, either stuck in the red area or struggling to reach the more promising yellow or green areas. Acknowledgement of the fact that Wipro is the only company situated in that specific portion of the speed gauge triggers basic but significant inferences: Wipro is a green company, it is fast and it is leading the race. The newcomer Indian company still has work to do before winning, as it has not scored ten points; the contest has not ended yet, as clarified by the question "Who will be the first to go green?". This question, flanking the speedometer, ideally shows the finish line and flaunts the prize of this apparently endless race for the leadership and the victory.

Despite the similarities and recurrent themes in all the editions of the Guide, the speedometer was first introduced in the eighteenth edition, significantly contributing to enhancing the explanatory potential of the document: while the ranking merely indicates position, the speedometer also shows directionality, incidentally enabling the readership to appreciate how distant companies are from one another in terms of "greenness". For instance, while Panasonic sits in eleventh position and LGE in twelfth, the speedometer unveils that the companies occupy almost the same position and can, thus, be said to perform more or less the same way. The gap between one company and another can also be grasped by comparing the points attributed, but the speedometer is a more intuitive instrument that provides a graphic overview of company performances and helps recontextualise the Toxic Tech discourse in the sports sphere. By gathering all the sixteen companies in a narrow but telling semiotic space, it plays an instrumental role in further condensing the results of the scientific investigation on the performances of the companies; in so doing, it also highlights, by implication, the difference that the choice of buying a device instead of another would make in health and environmental terms. It, thus, appears as an empowering discourse tool and knowledge-dissemination device, showing the consumer the right path to greener electronics.

5. Conclusions

The discursive analysis of the main documents published in the context of the Toxic Tech campaign provides significant indications regarding the knowledge-dissemination strategies implemented by Greenpeace. On the one hand, the hybrid *Green Gadgets Report* demands familiarity with scientific

notions and/or denominations to fully appreciate the explanation of the risks posed by toxic chemicals in electronic devices. Although the occasional occurrence of non-specialised terms, the sporadic presence of the deontic verb *need to*, the prototypical and stereotypical recourse to the problem-solving argumentation pattern, the numerous generalising strategies and the frequent explanations of specialised concepts assist the reader in understanding the Toxic Tech discourse, the GGR remains a document that shares a variety of features with scientific texts and, thus, addresses a heterogeneous but not totally unprepared audience. On the other hand, the simpler *Guide to Greener Electronics* appears to recontextualise, rephrase and simplify scientific data at the popular level, since the document seems to be exclusively conceived to turn the Toxic Tech problem into an entertaining sports event. The inherent complexity of the topic is mitigated and the references to toxic substances and their scientific names totally disappear, supplanted by the simplicity of attending a car race. Furthermore, the iteration of the deontic verb *need to* in relation to the prospective behaviour of tech companies towards issues of environmental ethics and health ratifies the non-objective and non-scientific nature of this text, whereby Greenpeace rises as the "referee" in the exciting, albeit serious, corporate competition for greenness in the tech sector. In light of these prominent discourse features, toxicity can be said to be exposed but certainly not explained or expounded in the *Guide to Greener Electronics*, and while the GGR is governed by logos, pathos prevails in the GGE.

The co-presence of these two inherently different texts in the context of the Toxic Tech campaign is not casual, but rather functional to the dissemination of knowledge on a wider scale; by tapping into elements of specialised discourse and the interplay between words and pictures alike, the Toxic Tech campaign results in a multi-genre discourse, addressing different audiences at the same time by skilfully merging scientificity and readability.

More broadly, the analysis of the GGR and the GGE also shows that the communicative pillars of Greenpeace's discourse are subject to regular review and rapid revision. Incidentally, as this study was being conducted and this paper drafted, the nineteenth edition of the Greenpeace *Guide to Greener Electronics* appeared on the official website of the NGO, towards the end of 2017. A superficial analysis of the new data indicates that the ranking criteria have been revised (changing from *Energy*, *Products*, *Operations* to *Energy*, *Resources*, *Chemicals*) and, particularly, that the scores from one to ten (employed since the first edition of the Guide) have been replaced by marks from A to F. Colours still play an instrumental discursive role, and more detailed explanations regarding their meanings appear at the bottom of the webpage, where a key specifies that *"A grades are green, B grades are olive, C grades are yellow, D grades are orange, F*

grades are red". Moreover, the superlative adjectives *best* and *worst* stand out next to green and red companies, respectively.

A further, significant update lies in the fact that Wipro, the leader of the 2012 race, unexpectedly disappears, overcome by the new leader Fairphone. Yet, the most meaningful novelty lies in the choice to abandon the speedometer, replaced by a similar picture that preserves the function of displaying directionality and the distance between the companies, but relinquishes references to speed and sports events. The competition, thus, appears definitively to be moved from the racetrack to school, where "student-companies" are rebuked, taught and assessed as if they were youngsters in desperate need for education. This discursive choice is not only functional to presenting imperfect companies as pupils, but also plays a crucial role in shedding light on Greenpeace as the possessor of knowledge and dispenser of marks, i.e. the professor in the toxic classroom. This radical and unexpected change in the discursive configuration of a twelve-year-old campaign seems to suggest that the rapidity of the communicative changes brought about by Greenpeace forces discourse studies to venture into the systematic description of activist discourse, in order not to lag behind.

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