Transition towards Socially Sustainable Behavior?
An Analysis of the Smartphone Sector

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Introduction and Background

Although smartphones are still a relatively new invention, they have quickly become ubiquitous throughout large parts of the world. As a result of rapid innovation cycles and poor repairability, they are also frequently replaced after as little as two years of use. Although there is beginning to be a general awareness of the negative ecological effects of this practice, only very few consumers are fully aware of the social implications of smartphone production. Like in other industries, the globalization of the production process of electronics has led to the creation of complex global production networks (GPNs) whose early stages are often characterized by poor working conditions. Particularly in supplier factories in developing countries, social sustainability issues (SSIs), including low wages, excessive overtime, child and forced labor, as well as lacking occupational safety and health standards, are still common. However, in recent years, public awareness of these issues has begun to increase somewhat as a result of publicity campaigns by NGOs and journalists, as well as the provision of alternative products with a focus on greater sustainability, such as the Fairphone.

In this paper, which is the first of two case studies, we will therefore examine whether and to what degree a behavioral transition towards greater social sustainability is taking place in the smartphone sector. We define behavioral transitions as normatively driven changes in a conglomerate of structures, culture, norms and practices that are a key element of long-term transitions towards greater sustainability.

Our analysis uses the Model of Behavioral Transitions to Sustainability (BTS), a heterodox and heuristic approach that is described in greater detail in the first working paper of this series (Bodenheimer 2016b). The BTS Model, shown in Figure 1, expands the operationalizability of the Multi-Level Perspective (MLP) (Geels, Schot 2010) by combining it with the Cyclical Dialectic Issue Lifecycle (C-DILC) model (Geels, Penna 2015; Penna, Geels 2015) and incorporating two behavioral models, the stage model of self-regulated behavior change (SSBC) (Bamberg 2013) and the corporate comprehensive action determination model (C-CADM) (Lülfs, Hahn 2014). The C-DILC model describes the development of public attention and concern to a specific trigger event or issue and how this in turn affects the actions of corporate and governmental actors. The two behavioral models are used to gain insight into the processes that take

place during a behavioral transition to sustainability and, of particular importance, the points where it is likely to fail or succeed.
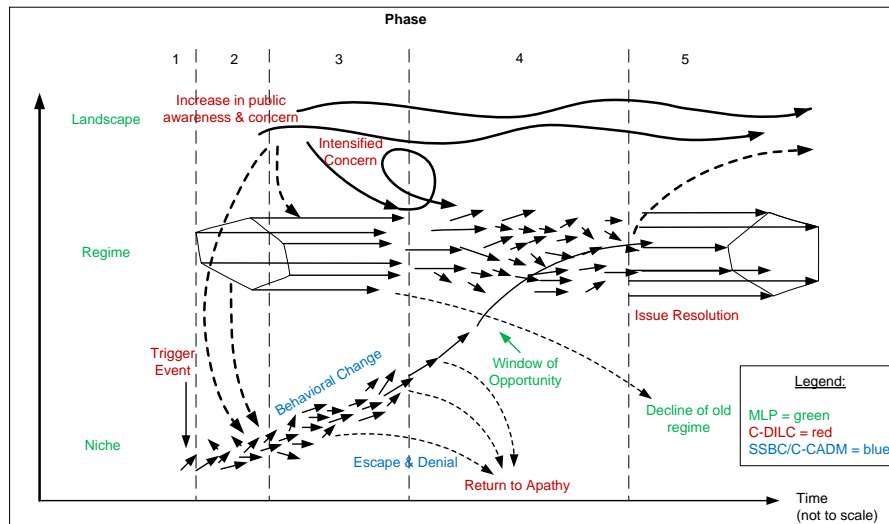

Figure 1:   Model of Behavioral Transitions to Sustainability
                   (Bodenheimer 2016a)

In this case study, a method akin to Hall's systematic process analysis (2006) is used to analyze both quantitative and qualitative data. Using a media coverage analysis, the level of public attention to SSIs in the smartphone industry is measured over time from 1994 to the present. An examination of this data allows for a preliminary determination of the issue lifecycle phases. This is then complemented and enhanced by an analysis of specific events of relevance in the smartphone industry that were gathered using a mixed search strategy as described in Greenhalgh and Peacock (2005).

The two behavioral models are used as the foundation for expert interviews, which build upon the insights gained from the historical analyses to examine the current status of the transition in each sector from the perspective of relevant stakeholders. Using the theoretical underpinnings, we were able to identify key drivers and obstacles for a behavioral transition to greater social sustainability in each industry. The combination of all of these individual pieces allowed us to assess the current status of the transition in each sector from the perspective of the MLP and its transition pathways.

This paper is organized as follows: Chapter 2 gives a brief introduction to global production networks in the smartphone industry. Chapter 3 outlines our methodology and data sources. Chapters 4 through 6 present our empirical results,

which are summed up from the perspective of the MLP in Chapter 7. Chapter 8 concludes.

1   Global Production Networks in the Smartphone Industry

1.1   Historical Development

Beginning as early as the 1960s, labor-intensive manufacturing in the electronics industry was moved from US and European sites to Asian factories to reduce production costs through cheaper labor and lower regulatory standards. This outsourcing trend continued with increasing speed throughout the 1970s and 1980s. China emerged as the dominant location for electronics manufacturing by creating special economic zones to attract more foreign direct investment and increase its sales through exports as well as offering an abundance of cheap labor that consisted primarily of young rural migrants (Chan et al. 2013).

Hon Hai Precision Industry Company (also known as Foxconn) was founded in Taiwan in 1974 (Pun et al. 2016) and became China's leading exporter after the country ascended to the World Trade Organization in 2001 and liberalized international trade (Chan et al. 2013). Electronics manufacturing service (EMS) providers that started out in North America or Europe also increasingly moved their operations to Asia, closing plants in western countries. While the top five exporters of mobile phones (Germany, UK, South Korea, US, Finland) accounted for 52% of all exports in 2001, by 2011, all of the original top exporters except South Korea had been replaced, with the top countries being China (43%), Korea (10%), Hungary (7%), Hong Kong (7%) and Mexico (5%). Together, these five countries accounted for 73% of all mobile phone exports, showing that production had become much more geographically concentrated in just one decade (Lee, Gereffi 2013). At the same time, the mobile phone sector also grew significantly, with global exports almost tripling between 2001 ($63 billion) and 2006 ($183 billion) (Lee, Gereffi 2013).

Beginning in the mid-1990s, mobile phone manufacturers began introducing phones with mobile internet capabilities. While the first models saw popularity among early adopters, the introduction of Apple's iPhone (2007) is credited with truly revolutionizing the mobile phone industry (PC Mag n.d.).
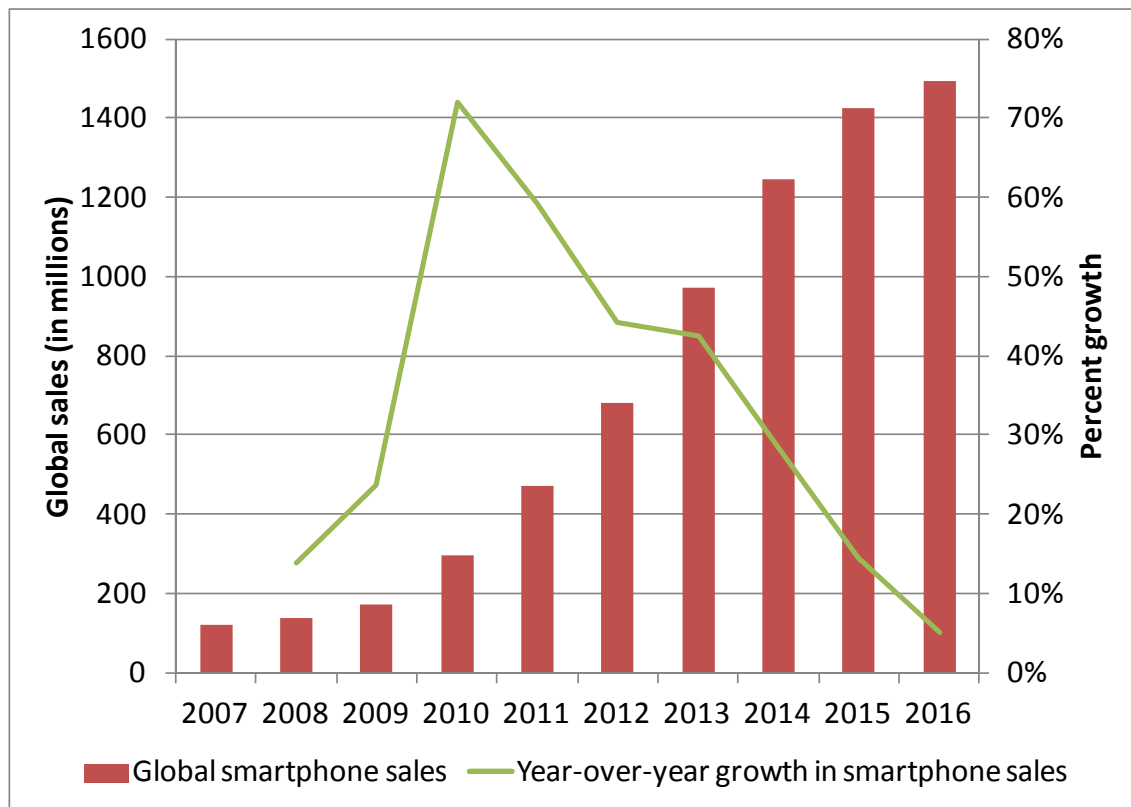
Figure 2: Global smartphone sales to end users (Data based on Statista 2017b)

As can be seen in Figure 2, global smartphone sales have been increasing continuously since 2007, with the most significant year-over-year growth taking place from 2009 to 2010. By 2013, a UN study found that 6 out of the world's 7 billion people had access to a mobile phone (Wang 2013). Growth rates in smartphone sales have decreased steadily since then as the market has become increasingly saturated and new innovations in the smartphone sector have slowed down (Gartner 2016a). By early 2016, Gartner assumed a smartphone penetration rate of 90% in developed countries and predicted that users would stop replacing their smartphones as often as in the past, thus increasing their devices' lifespan (Gartner 2016b).

1.2 Current Regime: Actor Groups, Interactions and Power Relationships

The smartphone industry is dominated by Samsung and Apple, who together control roughly 40% of the global market share of sales to end users. Samsung has consistently been the top smartphone vendor since 2012, with its market

share hovering between 20 and 30 percent (Statista 2017a). However, although it does not sell the largest number of phones, Apple has for years captured the lion's share of the smartphone industry's profits, with 'as little' as 76% (Q4 2013) and as much as 93% (Q4 2014) of profit shares going to the US firm (Chen 2014, 2015). Samsung, in turn, captures whatever profits are not taken by Apple, while all other brands "operate at no profit or at a negative margin" (Ray 2015, n.p.).

The smartphone industry has undergone simultaneous processes of fragmentation and consolidation over the last decade. Fragmentation has taken place in the *breakdown of activities*: while brand name companies continue to perform high-value added activities such as R&D and marketing themselves, low-value added tasks such as production and assembly have been almost entirely outsourced to suppliers (Lee, Gereffi 2013). Because significant changes in the volume of production in the smartphone sector are commonplace, suppliers must operate with "extreme employment flexibility and huge fluctuations of the workforce" (Lüthje, Butollo 2016, p. 220).

This flexibility is also necessary in order to keep up with the industry's demand, which has been fuelled by the rising significance of smartphones as a consumer product and status symbol. While times between the release of new iPhone models amounted to more than a year in 2008, Samsung's "new product rollout time" was as little as 91 days in 2013 (Bartley et al. 2015, p. 183). This has significant implications for the necessary production capacities, where output sometimes needs to increase by as much as 20 % prior to a new model release. For giant Foxconn, this would mean hiring 200,000 short-term employees prior to each new product launch (Chan et al. 2013). Since hiring – and training – such a large number of workers in a short period of time is nearly impossible, overtime tends to skyrocket during peak production times, such as during pre-holiday sales and when new models are released (Chan et al. 2013, p. 107).

Consolidation, in turn, has taken place *within activities*. This can be seen both among brand name original equipment manufacturers (OEMs), such as Samsung and Apple, and their suppliers: "lead firms facilitate the agglomeration of production in a specific region […] by co-locating their key suppliers, which multiplies the effect of their relocation on job creation" (Lee, Gereffi 2013, p. 9). For smartphones, sub-contracted manufacturing takes place primarily in the Pearl River Delta in China, "with complete supply chains, including software, displays, [printed circuit board] design and production, and chip development" (Lüthje,

Butollo 2016, p. 223). Some argue that this strategic consolidation is the only way for OEMs to effectively meet market demand (Yeung, Coe 2015).

However, while seven EMS companies made the Fortune 500 list in 2016 and lead firms are clearly dependent upon them, value distribution still clearly favors lead firms (Lee, Gereffi 2013), as do power relations. In discussing last-minute changes to production, a Foxconn manager conceded that "[n]aturally, Apple's supplier code on worker safety and workplace standards and China's labour laws are all put aside.' (*Interview*, 7 March 2011)" (Chan et al. 2013, p. 107).

1.3   Social Sustainability Issues

Thus, while suppliers have managed to improve certain labor standards, such as the number of overtime hours outside of peak production times, the welfare of employees continues to be subservient to just-in-time production and profits. The problems associated with working conditions in the current smartphone (and more generally, electronics) regime are amply documented by many different sources, such as Lüthje, Butollo (2016), Bartley et al. (2015), Lüthje et al. (2013), Duhigg et al. (2012), and Smith et al. (2006). They include, but are not limited to, the following issues:

- Poor working conditions, especially with regard to occupational safety and health
- Excessive overtime hours
- Less than one day off per week
- Minimum wages too low to support an acceptable living standard
- Lacking health insurance and other forms of social security
- Use of child labor
- Use of forced or bonded labor, recruiting fees and involuntary student interns
- Discrimination on the basis of gender, age, origin, religion, sexuality, health (i.e. Hepatitis, HIV, pregnancy, etc.)
- Inadequate company-mandated living quarters
- Militaristic management style
- No right to collective bargaining or the formation of unions
- No freedom of association
- Use of conflict minerals

2   Methodology and Data Sources

Since the BTS Model consists of a combination of four separate approaches (C-DILC, SSBC/C-CADM, and MLP), the empirical application likewise needs to take place in a stepwise fashion to account for all four underlying models. In the case studies, the C-DILC model serves as the starting point of the entire model. A method akin to Hall's systematic process analysis is used (2006) to analyze both quantitative and qualitative data. Using searches in the media database LexisNexis, the level of public and industry-specific attention to social sustainability issues in the smartphone sector is measured over time from 1994-2016. An examination of this data allows for a preliminary determination of the issue lifecycle phases. The quantitative data is then supplemented with a qualitative systematic process analysis of historical events (Hall 2006), which allows us to uncover causal relationships and examine interactions between various stakeholders in greater detail. The specific events are gathered using a mixed search strategy as described in Greenhalgh and Peacock (2005). These results, in combination with information gained from expert interviews, are then analyzed using the two behavioral models to better understand the decision-making processes underlying the actions of both corporations and consumers in the context of the smartphone industry. In the end, all of these results combined are used to garner insights into the transition according to the multi-level perspective. The following sections will describe the methodology used in greater detail.

2.1   Systemic Process Analysis

Like prior similar endeavors (Geels, Penna 2015; Penna, Geels 2012, 2015), we use the method of systematic process analysis to conduct our quantitative and qualitative analyses. Systematic process analysis, a form of process tracing, is a methodological approach aimed at explaining a particular outcome of events that is used in social science research where statistical methods are not appropriate. This may be due to the small number of available cases, due to causal factors that cannot readily be measured quantitatively or due to the fact that outcomes are "the product of an intricate strategic interaction among reformers, extremists and defenders of the old regime" (Hall 2006, p. 26). In the case studies presented here, all three of these factors apply.

Hall (2006) further identifies three separate modes of explanation in the social sciences: historically specific explanations, multivariate explanations and theory-oriented explanation. Systematic process analysis is used for theory-oriented explanation, which is described as follows:

> "[Theory-oriented explanation] construes the task of explanation as one of elucidating and testing a theory that identifies the main determinants of a broad class of outcomes and attaches special importance to specifying the mechanisms whereby those determinants bear on the outcome. In contrast to historically specific explanation, the object is not to provide a complete explanation for why one outcome occurs at a particular time and place, but to identify the most important elements in the causal chain generating this class of outcomes. In contrast to multivariate explanation, this approach attaches less value to securing precise parameter estimates for a few key variables seen as the 'ultimate causes' of the outcome and more value to identifying regularities in the causal chain through which the relevant outcome is generated. **The focus is on elucidating the process whereby the relevant variables have effects**" (Hall 2006, p. 25, emphasis added).

Systematic process analysis is particularly useful for research with small-n designs, where the focus is on examining the causal chain of a small number of cases in great depth using an approach guided by a specific theory. When conducting these case studies, observations should be made

> „about the events that can be expected to occur if a theory is valid, the sequence of those events, the specific actions taken by various types of actors, public and private statements by those actors about why they took those actions, as well as other observations designed to establish whether the causal chain that each theory anticipates is present in the cases" (Hall 2006, p. 28)

All of these actions and interactions of various actor groups in our case studies take place in the specific context of global production networks. While our focus will be on analyzing specific events and actors' resulting responses, it is important to understand the underlying political and economic structures, interdependence among various actors and historical path dependencies that characterize the situation within which our specific events take place and which were already described in Chapter 1.

2.1.1   Analysis of Media Coverage

A first element of the C-DILC model analysis is the evaluation of public awareness of social sustainability issues in each sector using a media coverage analysis. As described by Penna and Geels (2015), the measurement of public awareness and concern requires the identification of relevant proxy variables, as it cannot be measured directly. In democratic societies, the media is a primary vehicle of public communication and, as such, agenda-setting in society. Media coverage of a topic is therefore an appropriate indicator for public issue-attention and following the work of Newig (2004), we measured the level of media coverage as the number of articles on a specific topic per year.

As in prior work (Penna, Geels 2015), media searches were conducted as keyword searches in the database "LexisNexis News and Company" (hereafter

LexisNexis). This database includes 23,000 international press sources, such as newspapers, magazines, trade journals, news wires and agency news.

Penna and Geels limited their searches to four large newspapers and articles that included their search strings in the headlines. Since our case studies are quite current (what Elzen et al. refer to as "transitions in the making" (2011, p. 263)), we chose to use a more fine-grained search approach. Specifically, when looking at an ongoing transition that may not yet have progressed to the later DILC-stages where public awareness rises significantly, it makes sense to conduct searches on a monthly basis,[1] including all sources, and allowing references to the search terms to be found anywhere in an article. This way, early references to the issue can be caught even before it has reached mainstream newspapers. Moreover, using a monthly search approach, the data can be used to more easily identify relevant events for the qualitative part of the case study.

The search results were generated using LexisNexis' pre-defined source list "All News, All Languages" and all searches were run from January 1, 1999 through December 31, 2016. Duplicate articles were counted multiple times, since the diffusion of a single article through multiple sources increases the size of the readership and thus the potential for public awareness.

Our analysis included six search strings for the smartphone case study, each made up of multiple keywords.[2] As Lacy et al. (2015) point out, the use of single-keyword searches can lead to imprecise results and be tainted by the researcher's bias. By combining a series of literature-based keywords into search strings, the search validity is increased. The search strings were created in an iterative process using Boolean search operators. Manual spot-checks were used to check for precision, i.e. the relevance of articles found (Stryker et al. 2016). Where necessary and possible, the operator AND NOT was used to exclude obviously irrelevant search results. Searches were conducted both in English and in German and adjusted according to the respective Boolean search operators of each database.

The analysis of public attention using media coverage as a proxy has a series of advantages over other methods of measurement. First, it is widely applicable

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1   Since it is very labor intensive to conduct monthly searches over a longer period of time manually, we used an AutoHotkey-Script to automate part of the process. Many thanks go to Benedikt Schneyer and Stefan Haag for their valuable help with this task.

2   Search strings are available from the author upon request.

to any topic of interest and comparatively cheap and efficient. In contrast to other methods of measuring public attention, such as polls or surveys, there are no inherent limits to the issues that can be quickly and easily analyzed using media coverage. Search strings on any topic can be used without the added cost and time otherwise necessary to design and carry out large-scale data collection projects, since newspaper archives present a readily available data set of enormous size (Newig 2004).

Second, using searches in a large database like LexisNexis, rather than searching through the archives of individual archives is both more time- and cost-efficient and more likely to catch innovative niche approaches early on. Reporting on niche activities may only reach major, large-scale newspapers once they have reached a more advanced degree of diffusion, whereas smaller local newspapers or industry-specific magazines may write about them at a much earlier stage.

Finally, media analyses allow for the creation of both historical and current time series on any issue of interest, allowing for a quickly accessible overview of the development of the level of public attention to any topic over a broad range of time. The database LexisNexis is updated daily, although the historical coverage of the included sources is strongly variable (see further discussion below).

The interplay of these advantages allows this methodology to be applied particularly well to issues that are still in the early stages of development: "Polls, by contrast, most often only cover issues already 'established', thereby excluding the most sensitive first stages of attention cycles" (Newig 2004, p. 159). Yet an early identification of niche activities is key in the context of socially desirable sustainability transitions, since these should be identified and fostered early on to ensure their diffusion to a larger scale.

Nevertheless, there are also a number of disadvantages to using LexisNexis as the basis for media coverage and public attention analysis that should be taken into consideration when interpreting the results. The most critical of these are the possible biases inherent in conducting searches in any database with limited sources. While LexisNexis at present includes over 23,000 international press sources, not all of these sources provide the same historical coverage. For example, while some sources extend quite far back in the database (*Washington Post*: 1977; *The New York Times*: 1980; *Neue Zürcher Zeitung:* 1993;

Süddeutsche Zeitung: 1994), others have only been added quite recently (such as *Die Zeit:* 2008; *Financial Times Daily:* 2013; *BILD:* 2017).[3]

Finally, the quality of search results is dependent on how well issues can be captured in keywords. This can be problematic when relevant keywords are not distinct or unambiguous enough, although this issue could be resolved in the present study through the use of exclusions ("AND NOT"). Related to this are questions of recall and precision: recall is a search string's "ability to accurately call up items of interest," while precision refers to the relevance of articles found (Stryker et al. 2016, p. 413). In theory, both measures can be quantified for the use in statistical analyses (see e.g. Lacy et al. 2015). However, to achieve an accurate measure, all search results would need to be manually coded, which is a very time-consuming and involved process that is not realistic for large numbers of search results.

Unlike the work of Geels & Penna (2015), we did not perform statistical analysis on the data for the smartphone case study, but rather performed an exploratory visual examination of the data (Keim 2002). As Hall describes, statistical analysis may not always be the right approach for theory-oriented explanations, since "recent theoretical developments in social science tend to specify a world whose causal structure is too complex to be tested effectively by conventional statistical methods" (Hall 2006, p. 26). Examining the data visually provided a general overview of the progression of the issue lifecycles and overall transition, including pinpointing the timing of specific trigger events (which cause a spike in media attention) and indicating whether and when issue lifecycles took place.

With regard to industry attention, we generated a measure by running search queries in LexisNexis within a set of limited sources. For this case study, we used two American trade journals from the electronics industry, *Communications Daily* and *Consumer Electronics Daily*. To cover the German market, we also ran a search directly in the online archive of the website Heise.de, which includes a number of different electronics and technology publications, including *c't*, *Technology Review* and *iX*.

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3   While it is possible to ascertain the historical coverage of each individual source, LexisNexis unfortunately cannot provide summary details of how many sources are available for each year in the past. Given the large number of available sources, checking each source individually to reach a total per year is not economically feasible.

2.1.2   Systemic Process Analysis of Historical Events

An evaluation of a transition using the DILC phases described in Bodenheimer (2016a) requires a detailed understanding of events related to the issue in question. We define the term 'event' quite broadly in this context. Examples from the niche include civil society actions, such as the publication of investigative reports or the staging of protests, trigger events that catapult the issue into the media, as well as milestones (or failure) of niche projects that demonstrate alternative behaviors. Events from the regime can consist of press releases or official statements in response to the niche, symbolic actions to address rising concerns, or research and development of alternative behaviors. Depending on the issue in question, there may also be lawsuits, political investigations, hearings or debates. Note that in the early stages of a transition (primarily Phase 1), a regime's lack of acknowledgment (i.e. ignoring) of problem articulation by niche activists should also be included as an 'event', since it is an indicator of the regime's early behavioral pattern.

Since time is an important factor in all of the approaches that make up the BTS model, we organized the list of relevant events chronologically and assigned each event to one of the five DILC phases. Coding the events by DILC phase allows patterns to emerge that indicate the path of the lifecycle over time. Each phase includes 'problem-related pressures' and 'industry responses', which in our study always relate to social sustainability issues in the smartphone industry. As Penna and Geels suggest, the aim of the qualitative approach is the development of "a comprehensive multi-dimensional analysis" (2015, p. 1034), whose level of detail allows us to postulate causal relationships and gain greater insights into the outcome of various interactions between different stakeholders.

Our approach to finding qualitative data included both formal and informal components. The formal strategy consisted of protocol-driven searches (Greenhalgh, Peacock 2005) using Google Alerts, SCOPUS searches, the systematic and complete review of the news archives of four NGOs[4] that were identified as key civil society actors with regard to social sustainability in the smartphone industry and the subscription to relevant newsletters. Many other sources provided a significant amount of information, but were not consulted as exhaustively as those listed above. These included online information from NGO and civil

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4   WEED e. V., China Labor Watch, Students and Scholars Against Corporate Misbehaviour, and Electronics Watch.

society initiatives, blogs, user forums and corporate homepages as well as online news sources.[5] In addition to the targeted searches listed above, we also employed more informal search methods, such as "browsing, 'asking around,' […] being alert to serendipitous discovery" as well as "snowballing" (Greenhalgh, Peacock 2005, pp. 1064–1065).

The events included in our analysis consisted of:

- Sustainability and NGO reports and corresponding civil society or industry responses;

- suicides, accidents, cancer clusters, explosions;

- laws, lawsuits and legal decisions; and

- the emergence and activities of niche actors.

2.2   Expert Interviews

The expert interviews were semi-structured and guided using a set of open questions as described by Gläser and Laudel (2009). This approach ensured that the interviews were similar enough to be comparable while at the same time providing enough flexibility regarding the order and follow-up of questions for the interview to take place as a natural conversation (Mayer 2009, p. 37).

Given this paper's focus on transitions in the making, our underlying assumption is that the transition has not yet been completed. This means that some of the changes we are interested in are subtle and hard to measure as 'facts'. We were thus interested not only in concrete evidence-based information, but also in experts' personal insights. During the introduction of each interview, experts were therefore invited to openly communicate their experiences and opinions and it was emphasized that we were just as interested in impressions and personal assessments (in their capacity as an expert) as in hard facts..

As regards content, the focus of the expert interviews was to gather information that we could match to our behavioral models to identify which stages of each model have been successful, resp. where escape and denial is taking place. More specifically, with regard to the BTS model described here, there are three milestones of particular relevance:

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5   Detailed information on the specific sources used is available upon request.

1. *Perceived negative consequences*: Has public awareness of an issue risen enough to make individuals and/or corporations aware of the negative consequences of their own actions?
2. *Perceived goal feasibility*: Have social innovations in the form of alternative behavior solutions been communicated sufficiently to make the goal appear manageable to an individual and/or a corporation?
3. *Perceived behavioral control over alternative behavioral change strategies*: Are the necessary institutional and infrastructure prerequisites readily available for behavioral alternatives, so that these behaviors can actually be put into practice?

The qualitative analysis of events described above can give insight into the status of each of these milestones, which are prerequisites for a successful behavioral transition towards sustainability. Identification of the most likely points of escape and denial in the behavioral stage model allows actors pushing towards a sustainability transition to tailor their actions more clearly to the stage where behavioral change is most likely to break down and thus increases their chances of success.

A total of nine interviews were conducted for this case study with experts from the following organizations:

- WEED – Weltwirtschaft, Ökologie & Entwicklung e. V.
- Students and Scholars Against Corporate Misconduct
- PowerShift für eine ökologisch-solidarische Energie- und Weltwirtschaft e. V.
- Germanwatch e. V.
- Verbraucherzentrale Nordrhein-Westfalen e. V.
- c't – Magazin für Computertechnik
- Bundesanstalt für Geowissenschaften und Rohstoffe (BGR)
- Two brand name smartphone manufacturers (under the condition of anonymity)

The experts were selected in such a way as to include perspectives from all parts of the value chain being considered in this research.

3   Quantitative Analysis of Public and Industry Attention

Having described our methodology in detail, we now present our findings with regard to a possible transition towards greater social sustainability in the smartphone sector. In this chapter, we begin with the quantitative analysis of media coverage of SSIs in the smartphone industry.

3.1   Media Coverage and Public Awareness

The amount of media coverage for SSIs related to individual brands is used as a proxy for public awareness.

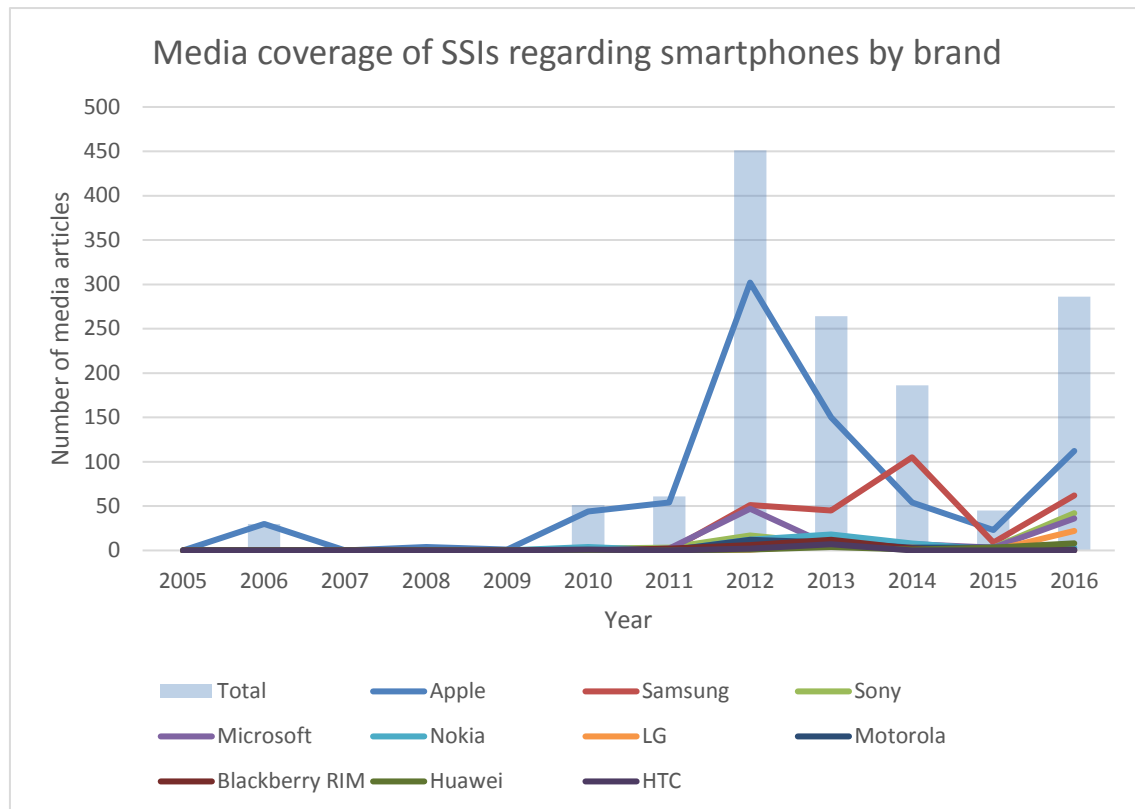Figure 3:   Media coverage of SSIs among smartphone brands (Data Source: LexisNexis)

Figure 3 shows the amount of media coverage of SSIs among smartphone brands from the regime. Since there were no relevant articles published prior to 2006, we only show data as of 2005. Apple's iPods were included in the search as the direct precursor to smartphones and are the subject of a 2006 article in

the British Mail on Sunday (2006), which published a first exposé on the work-ing conditions of Apple's Chinese production lines.

Thereafter, the media returned to silence concerning SSIs in the smartphone sector until 2010, when the number of articles reached 50 for the first time in large part due to the wave of suicides at Chinese Foxconn (Hon Hai Precision Industry Company, Ltd.) plants. In 2012, probably in part as a result of a nine-part, Pulitzer Prize winning New York Times series on the "iEconomy" (Duhigg et al. 2012), 450 media pieces were published and more than half of them fo-cused on Apple. The reporting in 2014 focused overwhelmingly on Samsung and its handling of a cancer cluster among its employees manufacturing semi-conductors. Following a noticeable slump in 2015, reporting again increased drastically at the beginning of 2016, due to a significant extent to Amnesty In-ternational's revelations regarding the use of child labor in the Democratic Re-public of the Congo for the extraction of cobalt used in electronics supply chains, including smartphones (2016).
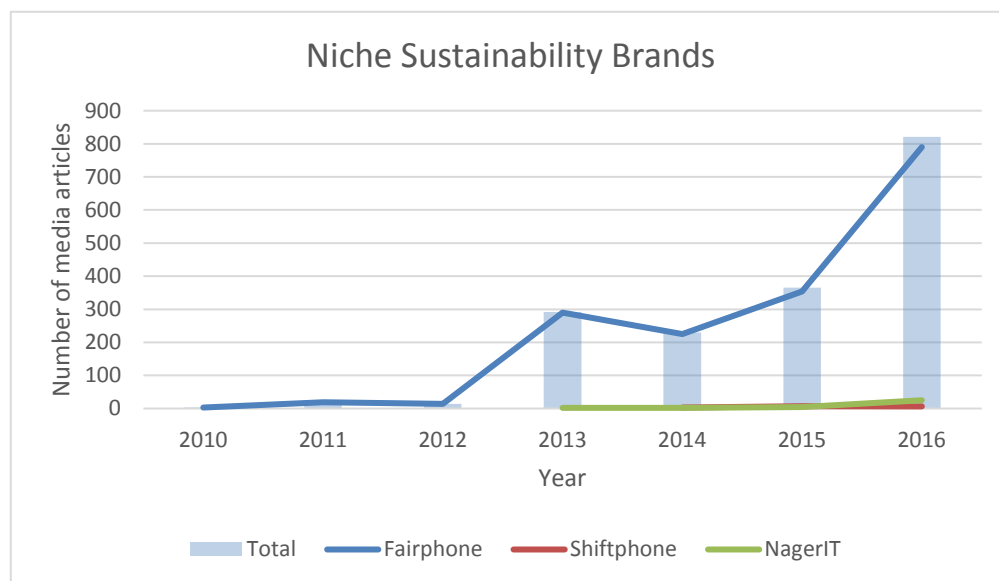
Figure 4:   Media coverage of SSIs among niche sustainability brands
                  (Data source: LexisNexis)

Beginning in 2013, the media also began to be interested in niche brands with a specific focus on social sustainability – especially the company Fairphone (Figure 4). Counting articles in all languages, Fairphone calculated that it was mentioned over 6000 times in 2016 alone (van Abel 2016). Our search, con-ducted only in German and English, yielded approximately 800 search results.
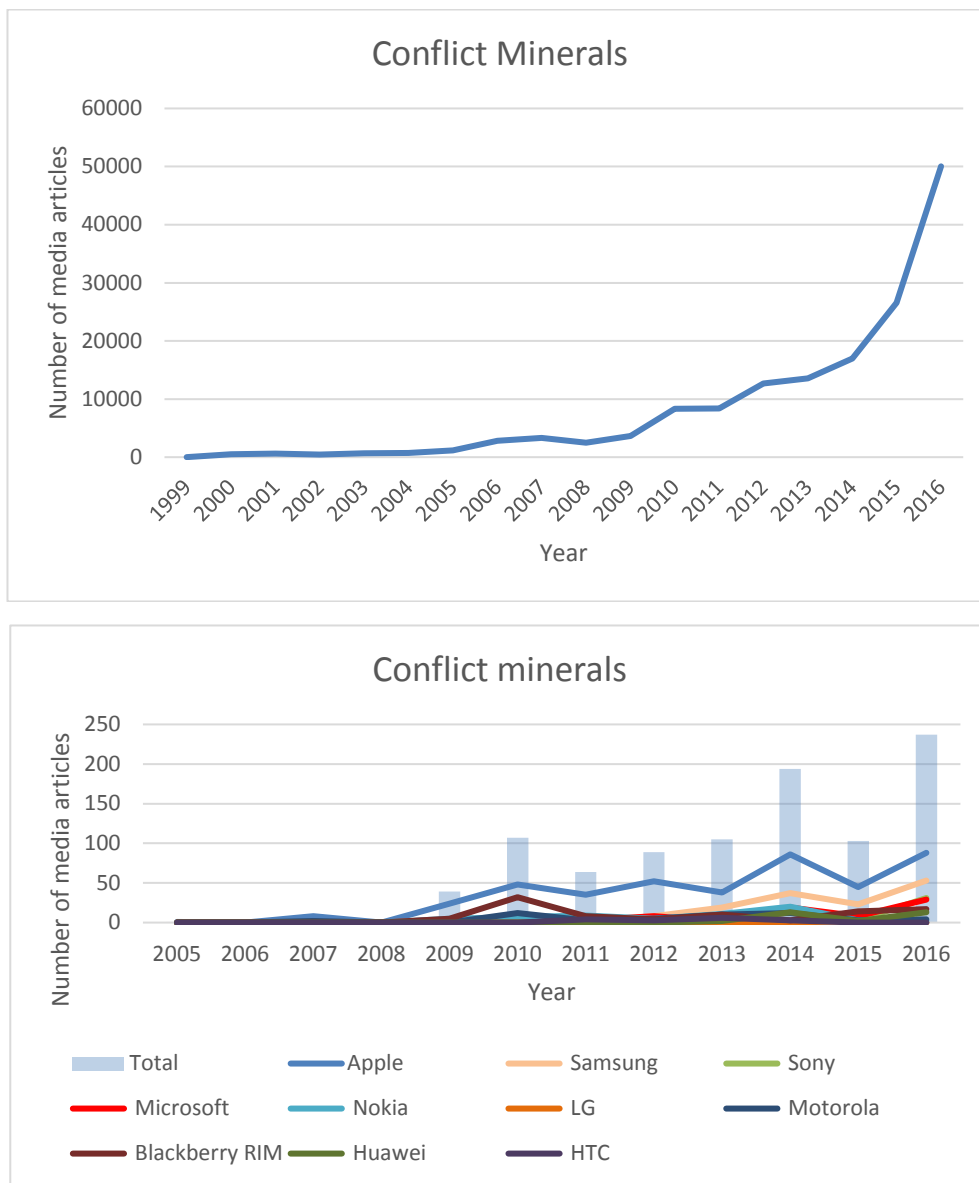
Figure 5:   (a) Media coverage of the issue of conflict minerals; (b) media coverage of conflict minerals and smartphone brands (Data source: LexisNexis)

While the SSIs examined above focus mainly on working conditions in factory settings and their impact on individual workers, social sustainability issues can also be of a larger, more political nature. This is the case for the issue of conflict minerals, which impact individual miners, but also an entire region in Africa covering several countries. Since conflict minerals have been treated as a separate issue from other SSIs both in the public discourse and political discussion, we have chosen to also cover them separately in our analysis. Figure 5 shows both

coverage of conflict minerals in general and with specific reference to smartphone brands.

As early as the year 2000, almost 500 articles were published on the subject of conflict minerals. In 2006, 2010 and 2012, there were significant increases in coverage leading to about 12,000 articles in 2012, followed by a dramatic spike in 2015 and 2016, with over 50,000 articles being published in 2016 (Figure 5a). This certainly makes conflict minerals a "celebrity issue" in the public discourse. However, there was fairly limited media coverage specifically tying the issue of conflict minerals to the production of smartphones by specific brands (Figure 5b). Once again, Apple and Samsung received the most individual coverage on this topic.

3.2   Industry Attention

In addition to examining media coverage of SSIs in sources aimed at the general public, we also analyzed coverage of SSIs and smartphones in relevant trade journals for the industry. As can be seen in Figure 6, the US trade journal *Consumer Electronics Daily* includes only a handful of articles in total over the entire time period examined. *Communications Daily* only published a single article on the subject in 2011. Industry coverage looks quite different for Germany, where the various publications of the Heise group included first articles on SSIs as early as 2003 and published more than 40 separate articles in 2013.
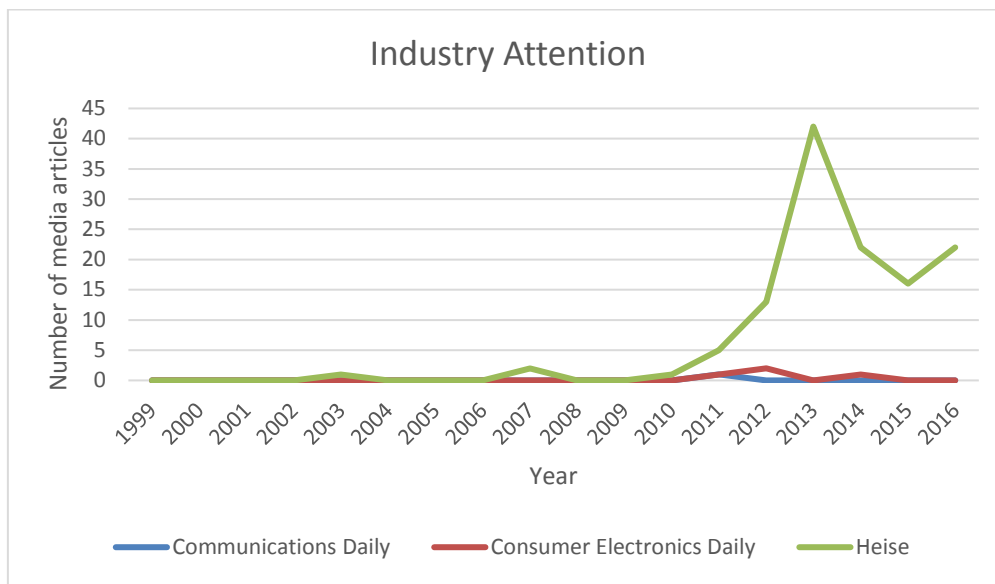
Figure 6:   Coverage of SSIs in representative German and US trade
                   journals for the smartphone sector (Data source: LexisNexis)

4   Systematic Process Analysis of Historical Events

We now turn to an in-depth qualitative analysis of relevant events that impact the transition towards greater social sustainability in the smartphone sector. While the focus of this case study is on smartphones, the transition we are looking at concerns the entire electronics sector and started well before smartphones were commonplace. Therefore, we begin our historical analysis prior to the sale of the first smartphone.

4.1   Phase 1 (1994 - 2005)

As a significant amount of electronics manufacturing moved to Asian countries with cheaper labor costs, phase 1 began with activists identifying defining, and articulating the problem of poor working conditions in Asian (particularly Chinese) factories and their connection to global trade regimes. Several NGOs were founded to address these poor labor conditions: the China Labor Bulletin (CLB), whose primary focus is on increasing the ability of workers to effectively engage in collective bargaining, was founded in 1994 in Hong Kong. China Labor Watch (CLW) followed in 2000 in the US and Students and Scholars Against Corporate Misbehavior (SACOM) was founded in 2005, also in Hong Kong. These NGOs have regularly published investigative reports since 2003, focusing primarily on factory working conditions (Friedman 2003).

While "the electronics-manufacturing sector started to appear on the radar of labour rights activists, NGOs and investigative journalists" as of the early 2000s, there was almost no reporting on the issue in mainstream media (Clarke, Boersma 2015, p. 5). Given the absence of newspaper reporting, the majority of the public likely had little awareness of SSIs associated with the electronics industry, as is to be expected in phase 1.

The lack of public concern also made it easy for individual companies to ignore NGO accusations and simply refrain from commenting on their reports. It is difficult to know to what degree electronics brands were aware of specific reports internally during this time, but the industry as a whole had certainly become aware of the general relevance of SSIs by 2001, when the Global e-Sustainability Initiative (GeSI) was launched. This was soon followed by the Electronics Industry Citizenship Coalition (EICC), which was founded in 2004 by eight electronics brands and Tier 1 suppliers, "seeking to create a [sic.] industry-wide standard on social, environmental and ethical issues in the electronics industry supply chain." (EICC 2017b). To this day, the EICC Code of Conduct is

employed by many electronics manufacturers as the primary standard-setting document for suppliers with regard to working conditions. In 2004, GeSI also launched a Supply Chain Working Group and as of 2005, the EICC and GeSI began working together. The closed industry front (with regard to (social) sustainability issues) that was forged through this cooperation is one of the key factors that moved the transition into Phase 2.

4.2   Phase 2 (2006 - 2009)

A second key factor in moving into phase 2 of the transition is a first increase in media and public attention to SSIs in the electronics, and later the smartphone industry. Three reports are particularly important: first, in May 2006, a 25-year old software engineer at Huawei in China died from exhaustion as a result of excessive working hours. This triggered an intense media outcry in China (Metz 2007). Second, in the summer of 2006, the British *Mail on Sunday* reported on the working conditions at Foxconn's Longhua iPod factory and connected these problems directly to Apple (Mail on Sunday 2006). Finally, in 2009, the British *Global Post* published a five-part series entitled "Silicon Sweatshops" that reported in detail on labor issues in those factories producing for the electronics industry (McLaughlin, Adams 2009).

In 2007, Apple published its first Final Assembly Supplier Audit Report as a response to the allegations of poor working conditions by the *Mail on Sunday* in 2006. The company states that third-party auditors first focused only on the factory mentioned in the press, but then "expanded our compliance activities and completed audits of all Mac and iPod final assembly manufacturers in 2006" (Apple 2007, p. 1). The audits consisted of records reviews, interviews with over 500 employees and physical inspections of 11 facilities. The auditors also conducted follow-up inspections after corrective action plans had been issued. This appears to be the first time an electronics brand ordered third-party audits of its facilities and published (a summary of) the results, which can be seen as a first allocation of funds towards incremental innovation in Apple's GPN to address SSIs and fits to industry response activities for phase 2.

Beginning in 2006, the early efforts by individual activists also increased and began including successful resource mobilization, issue framing in public discussions and public protest activities. The resulting emergence of a social movement is the third key factor moving the transition to phase 2. In terms of resource mobilization, the EU funded the international awareness raising campaign 'makeITfair' from 2007 to 2014 "to inform young people […] about labour

abuse […] in the electronics industry and activate them to improve the situation" (González 2014). It published over 40 reports and reached over 70 million consumers. In 2007, the EU also funded GoodElectronics, an international network on human rights and sustainability in electronics. By 2016, its members included more than 90 different public and civil society organizations worldwide (GoodElectronics).

Meanwhile, the industry's closed-front organizations invested some resources into the creation of programs addressing SSIs. For example, one report concludes: "[t]here is growing recognition of a connection between CSR and a company's ability to attract and retain international customers. In particular, companies within the […] ICT sector are increasingly requiring that their suppliers […] improve social and environmental standards" (FIAS 2007, p. 7). As a result, FIAS, the multi-donor service of the World Bank, launched a project to "develop a capability-building strategy for the ICT sector in Shenzhen to help it meet international social and environmental requirements and improve the soft competitiveness of the industry" (FIAS 2007, p. 7).

The industry used such projects in phase 2 to counter-frame the social movement's messages and to suggest that it was actively involved in improving the situation and no further action – especially of a regulatory nature – would be necessary. Many civil society actors, however, argue that most industry-driven solutions do not set the bar high enough and are not sufficiently transparent. In the FIAS project, for example, it is unclear which "international social and environmental requirements" will be met and how compliance will be verified.

Therefore, while publicly-funded activities focused on network-building and awareness-raising, individual NGOs began addressing companies directly and demanding public responses, again seeking to influence the framing of SSIs in the public discourse. In 2006, SACOM launched the "Clean up your Computer" campaign, which addressed working conditions at factories supplying seven brand name companies, including Samsung and Motorola (SACOM 2006). In 2007, Brot für Alle, the Swiss Catholic Lenten Fund and SACOM launched the campaign "High Tech – No Rights?", demanding responses from 32 brands and GeSI/EICC. By 2008, GeSI had submitted a response - deemed unsatisfactory by the NGOs – and Dell had promised to undertake a study on three surveyed facilities within 90 days, likely an example of symbolic action in phase 2. No other companies – including smartphone producers Apple, Ericsson, Flextronics, Foxconn, LG, Microsoft, Motorola, Nokia, and Samsung – responded

(GoodElectronics 2008), so that most regime actors stuck to their closed industry front.

Motorola, meanwhile, distinguished itself as an early forerunner by hiring an independent third-party audit firm to follow up on results published by makeIT-fair in 2008 (Chan et al. 2008). Similarly, when SACOM's investigations raised concerns of n-hexane poisoning among workers at a Motorola supplier factory in 2006, Motorola withdrew more than 50% of its orders from this supplier. This was likely a response to the negative media attention it had received as a result of worker rights violations (SACOM 2007). While it is commendable that Motorola acted on SACOM's report rather than ignoring it, their actions led to the supplier firing half of its employees. A more sustainable - but also more radical - course of action would have been to support the supplier in improving its working conditions. Motorola's response can therefore be seen as exploring incremental innovation with regard to its responses to SSIs, which is not uncommon in single regime actors in phase 2.

As NGOs put pressure on corporations, their employees (i.e. those affected by the issues) likewise began raising their voices and in doing so, became part of the larger social movement. After developing cancer, former employees of Samsung's semiconductor factories in South Korea demanded compensation through the Korea Workers' Compensation & Welfare Service (KComWel) in 2007, but lost in May 2009 (Jekutsch 2012). In the same context, the organization Supporters for the Health and Rights of People in the Semiconductor industry (SHARPS) was created in South Korea, which includes human rights and occupational safety and health (OSH) groups, progressive political parties, and workers' organizations. SHARPS is at the forefront of the fight for worker compensation and will play a significant role in phase 3.

In China, meanwhile, 7000 workers went on strike in April 2009 at the Wintek subsidiary Dongguan Masstop in Donguan (SACOM 2009a), which produced parts for Apple, Nokia, HTC and Huawei (SACOM 2009b). The workers protested because overtime pay was lower than the legal minimum and subsidies were being held back. Management eventually agreed to pay the legal mimimum in overtime pay, but other issues remain unresolved. Following this strike, Huawei reduced its Wintek orders by 35%: "Due to the Winteck's [sic] bad behavior regarding to social responsibilities and the adverse effect caused by the CSR Event to Huawei's brand of social responsibilities, Huawei has determined to reduce the orders placed for Winteck products, exerting pressure to Winteck and urging Winteck on the CSR improvement" (Huawei 2009, p. 1).

While at first glance this seems like a very progressive response by Huawei, the NGO SACOM expressed serious doubts as to whether Huawei's motivation really stemmed from the social responsibility component of the strike:

> "Huawei claims their policy is to give suppliers three to six months to improve conditions before Huawei will reduce orders […]. However, it has not been three months since the 7,000-worker strike at Wintek's Dongguan Masstop in mid-April 2009, but Huawei have already cut their orders.
>
> It sounds as if Huawei were already planning to reduce the orders anyway and are taking advantage of the coincidence by pretending to have cut the orders as an act of CSR. It seems to us that Huawei reduced the orders because they thought their supply chain would be disrupted by further worker actions" (SACOM 2009b).

If SACOM's assessment is correct, Huawei's actions were more likely symbolic action meant to improve its public image, rather than a radically innovative response to SSIs.

Finally, during phase 2, the issue of conflict minerals began being widely discussed in the press, although only a few articles connected it specifically to the smartphone supply chains of individual electronics brands (see earlier discussion in Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**). Politically, the issue became increasingly significant, as Republican Senator Brownback of Kansas attempted to introduce conflict minerals legislation in the US Congress both in 2008 and 2009. The Conflict Coltan and Cassiterite Act of 2008 died in Congress, while the Congo Conflict Minerals Act of 2009 was vetoed in Committee (Govtrack 2008, 2009). Although ultimately unsuccessful, these two pieces of legislation are more an early attempt at radical change by an activist policymaker (phase 3) than symbolic action (phase 2) and they were likely important steps towards the US conflict minerals legislation that was successfully passed in 2010 (in phase 3).

While the smartphone production of individual brands was not a significant target of media coverage, the electronics industry as a whole was certainly strongly impacted by the conflict minerals discussion. EICC/GeSI therefore also began taking action on the issue of conflict minerals in phase 2. In June 2008, the organization published a joint report on raw materials used in the electronics industry, including associated conditions along the supply chain. The study concludes that "there are opportunities for the EICC and GeSI members to influence social and environmental performance in mining and metals production" and recommends that the electronics industry engage with existing initiatives and stakeholders (GeSI/EICC 2008, vi). Shortly thereafter, EICC/GeSI created the Conflict-free Sourcing Initiative, which also runs the Conflict-Free Smelter

Program (EICC 2017a) and continues to remain one of the key certifying organizations with regard to conflict minerals.

4.3   Phase 3 (2010 - present)

Three major trigger events, two of them in 2010, moved the transition into Phase 3: 1) the suicide wave at Foxconn that began in 2010; 2) passing of the Conflict Minerals Rule as part of the U.S. Dodd-Frank Act in 2010; and 3) the emergence of the niche company Fairphone in 2013. Moreover, the discussion that was triggered by these events has been kept alive by a series of smaller occurrences that were reported on by civil society and the media and have forced brand name companies to change their strategy in dealing with these issues. A subset of these events will be discussed below.

In 2010, Foxconn received significant global attention, both from the media (Guo et al. 2012) and academics (Chan, Pun 2010; Cheng et al. 2011; Guo et al. 2012; Litzinger 2013; Ngai et al. 2014; Xu, Li 2013) when 13 Foxconn workers committed suicide and 5 more attempted to commit suicide. While media attention to the issue waned over the following years as the frequency of suicides decreased, these events continued to occur for at least another 4 years, with a minimum of 42 Foxconn employees attempting suicide between 2009 and 2014. At least 31 of these attempts resulted in completed suicides.

The most critical time for Foxconn was between March and the end of May 2010, when 12 of the suicides happened, sometimes on a daily basis. Based on articles in the Chinese press, Xu and Li conducted a detailed analysis of Foxconn's crisis management during this time, which they largely describe as a failure (2013, p. 371). Interestingly, Foxconn's communication with regard to the suicide wave follows the expected industry responses of the DILC model. The company made no public statement until after the third death and continued not to comment on the suicides until after the fifth case, simply confirming until then that the suicides or attempts had taken place and largely ignoring the issue, i.e. phase 1 behavior. However, "the lack of response from Foxconn's senior management left the dissatisfied voices of the employees and the public unanswered [and …] led to a more negative perception of its reputation" (Xu, Li 2013, p. 376).

Starting after the fifth case, the company began to publicly blame the suicides on employees' personal problems, thus defending itself by denying its own responsibility and the presence of more systemic problems (phase 2). Spokes-

person Liu Kun "explained that all the workers who committed suicide had been born in the 1980s and 1990s and suggested that they were psychologically weak by comparing them with the elder generation of workers who 'worked well in a much tougher environment' (Chen et al. 2010, April 10)" (Xu, Li 2013, p. 377). Foxconn thus offered two possible explanations for the suicide spade, either personal weakness among the affected employees or societal causes, but certainly not the company's military management style or poor working conditions.

In fact, at one point, Foxconn argued that there was no problem at all since the number of suicides among its workforce were below the national average in China, implying that the situation was perfectly natural (Guo et al. 2012). However, a number of details make this interpretation rather unlikely. First, one of the employees who committed suicide in 2014 was an internationally published poet (Yang et al. 2015) whose poems refer clearly to the burdens of overwork, poor working conditions, withheld wages and health concerns (Nao 2014) and paint the suicides at Foxconn as an instrument used by workers "to testify that we were ever alive at all, / and that while we lived, we had only despair" (Chan, Pun 2010).

Second, already prior to the Foxconn suicides, psychiatric scholars had analyzed demographic trends among those who commit suicide in China and the results do not match up with the spade of suicides at Foxconn: 93% of Chinese suicides happen in rural China, not in urban factory settings (Law, Liu 2008, p. 82). Only 3-7% of Chinese suicides are committed by jumping from a high place (Law, Liu 2008, p. 82) – which is how all but between one and three[6] of the 42 suicides/attempts at Foxconn took place. Additionally, jumping from the roof of factory buildings to areas that are constantly frequented by other workers is a particularly public form of suicide that could well be interpreted as making a final statement – an interpretation that is in line with the quoted poem above. Suicides are also much more common among women then among men in China: "in those younger than age 60 years, female rates exceed male rates by an average of 26%, with rural female rates exceeding rural male rates by 66%" (Law, Liu 2008, p. 82); of the Foxconn suicides and attempts, at least 26 of the 42 employees were male, with information on the gender missing in four cases.

Law and Liu also provide insight on common reasons for suicide in China:

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6 For two of the cases, information on the manner of committing suicide could not be obtained.

> "well-known suicide risk factors and triggering events [include] previous suicide at-tempt, acute stress, interpersonal conflict within days before suicide, low quality of life, high chronic stress, family history of suicide, and having known another person with suicide behavior […]. Suicide risk increase[s] with exposure to multiple risk factors in a "dose-dependent" fashion […]" (Law, Liu 2008, p. 83). Moreover, in China, "[t]hese individuals typically are found not to be clinically depressed, but so-cially powerless and marginalized" (Law, Liu 2008, p. 84).

In discussing Foxconn management's belief that workers „had hidden and trou-bled psychological problems, which supposedly predated their arrival on the factory floor," Litzinger comments: "It was as if suicide in a factory setting could not have anything to do with the conditions under which these young workers toiled—the long hours, the repetitive tasks on the factory floor, the lack of over-time pay, the crowded dormitory spaces, the alienation from home, and the empty modernity promised through a life of urban factory living" (2013, pp. 172–173). This description seems to fit Law and Liu's risk factors rather well.

Following the ninth suicide, Foxconn hired the PR firm Burson-Marstaller to handle its interactions with the media, a clear indicator that it was struggling to regain control over the framing of the suicide issue in the public discourse (phase 3). Burson-Marstaller's strategy included another phase 3 strategy - the willingness to make small concessions - by granting unprecedented factory ac-cess to journalists as well as an in-depth interview with Foxconn CEO Terry Guo. In the interview, however, Guo described the firm's philosophy with quotes such as: "'work itself is a type of joy,' 'a harsh environment is a good thing,' [and] 'hungry people have especially clear minds'" (Elmer-DeWitt 2010), thus not helping his cause too much.

Publicly, Guo did not become involved until after the tenth suicide. On May 24, 2010, four months after the first suicide, Guo "stated that Foxconn is definitely not a sweatshop and that he was confident the situation would be under control within a short period of time (China News Net 2010, May 24)" (Xu, Li 2013, p. 377). Following the 11th suicide, Guo sent a letter to employees entitled "A Letter to Foxconn Colleagues" in which workers were asked to sign a "no sui-cide pledge", including the following passage:

> "2. […]I will not harm myself or others; I agree that, in order for the company to pro-tect me and others, it can send me to a hospital should I exhibit abnormal physical or mental problems.
>
> 3. In the event of non-accidental injuries (including suicide, self mutilation, etc.), I agree that the company has acted properly in accordance with relevant laws and regulations, and will not sue the company, bring excessive demands, take drastic actions that would damage the company's reputation or cause trouble that would hurt normal operations" (Chow 2010).

The next morning, Guo opened up Foxconn's Shenzhen complex, also known as the „Forbidden City", to 200 national and international journalists to show off the factory's modern infrastructure (Xu, Li 2013, p. 377) and announce that nets would be put up around buildings to prevent future suicide attempts from being successful (Spiegel Online 2010a). Hours later, the 12th suicide took place (Xu, Li 2013, p. 378).

In June 2010, Foxconn increased its wages by 30%, arguing that this would allow employees to enjoy more free time, which would surely be good for their health (Spiegel Online 2010b). The NGO SACOM, however, was quick to point out that the legal minimum wage in China was about to increase by similar amounts and the company simply increased wages slightly ahead of schedule (SACOM 2010), making this more of a symbolic gesture than a substantive and radical change.

In the immediate aftermath, Apple responded to the Foxconn suicides by publicly defending its supplier, with then-CEO Steve Jobs stating in June 2010 that he finds the suicides "troubling", but reiterating Guo's statement that Foxconn "is not a sweatshop" (Oreskovic 2010). Behind the scenes, the company convinced Gou to drop a libel lawsuit against two Chinese journalists who had reported on poor working conditions at Foxconn's factories (Elmer-DeWitt 2010). Apple was hedging, trying to simultaneously voice some concern and downplay the issue, which places its response somewhere between phases 2 and 3.

Similar to Huawei's response to Wintek Dongguan's issues in phase 2, Apple began moving some of its production to Foxconn-rival Pegatron, another China-based supplier, in 2011. While Apple never commented on this decision publicly, the 'official' explanation for this move was the diversification of and risk reduction in its supply chain after Foxconn delivered several iPhone 5s with scratches (Campbell 2013). Unofficially, however, rumors abounded that Foxconn's wages had risen too much as a result of the suicide wave and its subsequent attempts to improve working conditions, and that Apple was looking for a cheaper alternative (Osborne 2013). These conjectures found some support when CLW released its first critical report of Pegatron two months later, arguing that the working conditions at Pegatron were even worse than at Foxconn (China Labor Watch 2013; Neate 2013). Regardless of the motivations behind the move, Chan et al. point out that "[t]his diversification demonstrates the power asymmetries between Apple and its manufacturers as Foxconn and others seek to retain market position as producers of the iPhone and iPad" (Chan et al. 2013, p. 106).

While this is certainly true, Apple was in turn also increasingly under pressure from the media. In addition to the Foxconn suicides, the Pulitzer-Prize-winning "iEconomy" series published in 2012 in *The New York Times* raised a lot of public attention to issues of social sustainability in the electronics sector (including smartphones), with particular regard to Apple (Duhigg et al. 2012). However, the media is quick to focus on a few individual companies while ignoring the rest:

> "When a Foxconn plant producing Apple products is accused of mistreating its workers, it triggers a media firestorm. Apple is then forced to address the issue to try to contain the fallout.
>
> But when the same Chinese company is accused of abusing workers on behalf of any other major technology company, the reports are greeted with a relative yawn by Western media" (Tsukayama 2013).

This trend could already be observed in **Fehler! Verweisquelle konnte nicht gefunden werden.**, which showed that Apple and Samsung have received by far the most attention of any smartphone brands with regard to SSIs.[7]

Throughout phase 3, NGOs have also continued publishing critical investigative reports on the electronics and smartphone industry, which with time also increasingly felt forced to respond. In one example, CLW and Samsung engaged in a prolonged exchange over child labor that lasted several months: On August 8, 2012, CLW published an investigative report on HEG Electronics, one of Samsung's supplier factories, indicating that roughly 80% of the workforce is made up of student laborers, as well as 50 to 100 children, "working under same [sic.] harsh conditions as adult workers, but [being] paid only 70% of the wages […]. Moreover, these child workers were often required to carry-out dangerous tasks that resulted in injury" (China Labor Watch 2012a, p. 3).

The next day, Samsung responded with a press release, stating that

> "in March and May of 2012, Samsung Electronics conducted two separate on-site inspections of working conditions at HEG Electronics [,…which] did not reveal the allegations mentioned in the China Labor Watch report. Following the recent allegations, Samsung immediately dispatched a team of in-house inspectors […] to the HEG facility in Huizhou. […] Companies that largely outsource their production for cost-cutting purposes may face a far higher risk of encountering problems with labor rights, working conditions, and worker safety. In contrast, companies like Samsung, which rely almost entirely on in-house manufacturing, are far less likely to expose itself [sic.] to such risks" (Samsung Electronics 2012a).

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[7] This should not be taken as proof that these two companies have definitively done the most – either in the positive or negative sense. It does mean that our analysis is heavily focused on these two brands, simply because the most information is available for them.

In particular the last two sentences are a clear attempt by Samsung to improve its public reputation by differentiating itself from its competitors, indicating some tension in the closed industry front (phase 3). One month later, Samsung published the official audit results, stating that no instances of child labor had been found, but a number of other issues, such as excessive overtime, "potentially unsafe practices" and "failure to provide access to a medical clinic" had been discovered (Samsung Electronics 2012b). The strategy of making some smaller admissions to less incendiary issues while denying the more dramatic ones, such as child labor, is a common industry response in phase 3.

This exchange of reports and press statements continued as CLW published three more investigative reports on Samsung's supplier factories (China Labor Watch 2012b, 2012c, 2012d), one of which was also reported on by Germany's weekly magazine Der Spiegel (Schmundt 2012), while Samsung announced the results of its in-house audits of 105 Chinese suppliers. It again found no evidence of child labor, but a series of other problems requiring attention. However, in spite of officially not finding underage workers, Samsung announced the implementation of new corrective measures for its suppliers, including a „New Hiring Process to Avoid Child Labor" (Samsung Electronics 2012c), thus taking some action on this front as well.

In December, Samsung and CLW seemed initially to come to an agreement:

> "We told Samsung that we discovered child labor [at another factory] and that if they agreed to support the study and living expenses of these children until 18 years of age, CLW would give Samsung these workers' names. Samsung responded that they would agree to such terms as long as they confirmed that the workers were in fact underage" (China Labor Watch 2012f).

A meeting between CLW, Samsung and the three underage workers was scheduled, but two of the girls were asked to leave the factory on the morning of the meeting and did not attend. The third employee came to the meeting, but CLW claimed that her ID card was faked and that the photo on the card clearly did not match the employee (China Labor Watch 2012f). Moreover, since this factory had also been audited by Samsung two months earlier, CLW argued that their discovery of child labor proved the "ineffectiveness of Samsung's audit system" (China Labor Watch 2012e). Samsung denied these claims (Samsung Electronics 2012d).

With that, this particular cat-and-mouse-game ended. While there is no clear winner and the issue was not resolved by either side, the exchange shows that by phase 3, even huge industrial conglomerates such as Samsung Electronics

can no longer afford simply to ignore or deny allegations by NGOs. Instead, they begin hedging and offering compromises – in the form of admitting to some more minor infringements while continuing to deny the more serious allegations, such as child labor – and engaging in lengthy struggles over the framing of an issue in public discussions.

Apple has likewise had to deal with the issue of child labor in its supplier factories. In contrast to Samsung, which continuously denied problems with underage laborers (Section **Fehler! Verweisquelle konnte nicht gefunden werden.**), Apple reported more openly on its findings and thus favored a more innovative approach. Since 2009, the company has regularly admitted in its Supplier Responsibility Reports that it has found active or historical cases of underage labor. In the 2013 Report, Apple began distinguishing between its final assembly suppliers and the rest of the supply chain, stating that in 2012, "we found no cases of underage labor at any of our final assembly suppliers. […] Many suppliers tell us that we are the only company performing these audits, so when we do find and correct problems, the impact goes far beyond our own suppliers" (Apple 2013). Often, underage labor stems from third-party labor agents who intentionally hire minors, so that Apple's follow-up actions to such discoveries include not only ending business relationships with certain suppliers but also alerting local governments to these practices (Apple 2013).

While it is undoubtedly problematic that, year after year, Apple continues to discover child laborers somewhere in its supply chain, their willingness to provide a higher level of transparency about both their discoveries and follow-up actions in their Sustainability Reports than many of their competitors does earn the company commendations amidst all of the criticism and can be seen as a radical innovation in its supply chain practices.

This is especially true when Apple is once again placed in direct comparison to prime competitor Samsung. An alternative to trying more progressive and innovative approaches and increasing transparency in phase 3 is to purposely without relevant information in the attempt to control public framing of an issue (Geels, Penna 2015). In Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**, we had already noted that several of Samsung's employees in semiconductor factories had developed cancer and that KComWel, Korea's workers' compensation service, had denied their claims. In response, the labor organization SHARPS sued KComWel in early 2010 on behalf of affected employees for its decision to deny them compensation (Jekutsch 2012). In May 2010, Samsung publicly denied the possibility that their employees had been

exposed to harmful chemicals that could have caused cancer (The Hankyoreh 2010). Nevertheless, in July 2010, a Korean newspaper reported that a number of families had come forward stating that Samsung had offered them lucrative settlements in exchange for their agreement to drop their lawsuits against the company in this matter (Jae-hyeon 2010), which was of course not stated publicly by the company.

Not all families dropped their lawsuits and in June 2011, the Seoul Administrative Court overturned KComWel's decisions in two of the six cases, ruling that their leukemia must be recognized as an industrial accident and that the affected employees had a right to compensation (Chun-hwa 2011). In response, Samsung released a press statement indicating that the company was not ready to accept the court's verdict: "Given that the ruling has not yet been confirmed, we will work so that apprehensions are alleviated through the ascertaining of the objective truth about the semiconductor working environment" (Chun-hwa 2011). To this end, Samsung commissioned Environ International Corp., a consulting firm focusing on environmental and social issues, to conduct a study on health and safety inside its semiconductor facilities, which "concluded that the scientific evidence does not support a link between workplace exposure and the diagnosed cancers in six cases that underwent specific review" (Ramboll Environ 2011). In the media, however, the study was discussed as very narrow and criticism was raised over the fact that neither the underlying data nor the study itself were ever released, although the study was presented at two academic conferences (Ramstad 2011; Samsung 2016). Moreover, in 2012, KComWel recognized two further cancer cases as occupational disease from Samsung's semiconductor factories (SHARPS 2012a, 2012b).

While these decisions represent an important milestone, to date only 10 cancer cases from Samsung's Korean plants have been designated as occupational diseases by KComWel; 23 remain under review (Malone 2016). In contrast, by 2014, almost 200 suspected occupational disease cases at Samsung had been reported to SHARPS (Kyle 2014).

In 2012, benzene and formaldehyde, both known human carcinogens, were detected in Samsung's semiconductor factories. Only at this point did the company officially begin monitoring levels of these chemicals (Lee 2015; Malone 2016). But even thereafter, Samsung continued to be very tight-lipped in informing its employees about their workplace exposure to potentially harmful chemicals. As was exposed in 2016, the company cited protection of trade secrets as its reason for withholding this information in several court cases. While it is ille-

gal in South Korea to withhold "corporate information needed ,to protect the lives, physical safety, and health' of individuals on the grounds of trade secrets, […] there are no penalties for violations" and government officials of the Korea Occupational Safety and Health Agency openly admit that "corporate interests take priority, that evaluating trade-secrets claims is difficult, and that they fear being sued for sharing data against a company's will" (Malone 2016).

By May 2014, pressure on the company had risen significantly both due to the cancer cases and repeated demonstrations pertaining to employees' rights to form independent unions (Koo 2014). Samsung publicly apologized to the affected workers and families for not supporting them financially in their time of need, but emphasized that their apology was not an admission that the cancers had been caused by work-related exposure to chemicals (Lee 2014). Following its loss in appellate court pertaining to the 2011 occupational disease recognition (Yonhap News Agency 8/21/2014), Samsung agreed to the creation of "an independent arbitration body to investigate all parties' concerns [and] to make recommendations for settlement", referred to as a Mediation Committee (SHARPS 2015a), thus initially appearing to make more substantive concessions. However, after this Committee announced its recommendations in 2015, Samsung suddenly walked out of negotiations and returned to dealing directly with a subset of families who had split off from SHARPS. While it agreed to provide some financial compensation, making a small concession (phase 3), other aspects of the mediation, in particular measures to prevent the occurrence of occupational diseases in the future, were neither addressed nor commented on by the company (SHARPS 2015a). Moreover, the roughly thirty families who accepted compensation also had to sign a confidentiality agreement, which forbade them from discussing the amount of compensation they had received and from pursuing further legal actions against the company (SHARPS 2015b).

This strategy backfired, exposing Samsung to significant criticism from the international media. For example, the Financial Times wrote: "The long-running controversy has threatened the brand power of the world's biggest electronics company by sales and fueled criticism that South Korea's dominant chaebol conglomerates have shirked their social responsibilities at home while expanding rapidly abroad," (Mundy 2015). Shortly thereafter, another long article was published by the Associated Press, asserting that "Samsung aid for sick workers comes with conditions, secrecy" and criticizing the company's refusal to agree to an independent body "to oversee compensation and monitor safety and preventive measures at its factories", which had been called for by the independent mediator (Lee 2015). This prompted the company to publish a press

release the next day, denying many of the accusations as false and providing its own justifications for others. With regard to the independent organization, Samsung essentially argues that the more radical solution demanded by civil society is too costly (phase 3) by stating:

> "We are not funding an independent body as recommended by the Mediation Committee because the incorporation of such an association and its operational costs and other expenses would consume up to 30% of the fund, a sum of KRW 30 billion ($25.2million). Samsung Electronics believes the greatest percentage of the fund possible should be directed toward providing financial aid. For this reason, we believe that it is in the best interest of families and patients to direct more funds to meeting their needs, which cannot be achieved through an independent fund" (Samsung Electronics 12/12/2015)

There is no mention of the proposed organization's role to oversee safety conditions and preventive measures in the statement. Nor did Samsung provide an explanation as to why its workers' compensation payments are attached to such strict confidentiality agreements (Samsung Electronics 12/12/2015).

In the end, only one month after this press release, Samsung bowed to public pressure and reached an agreement with SHARPS through the official mediation committee that includes an independent monitoring body ("Ombudsman Committee) for inspections of Samsung's facilities and the company's promise to "faithfully implement proposed improvements from the Ombudsman Committee and remain[...] fully committed to providing a safe and healthy working environment for our valued employees" (Samsung Electronics 1/12/2016).

While the conglomerate of employees, civil society actors and the media put increasing pressure on smartphone brands, so did policymakers during phase 3. Several SSIs from the smartphone industry were regulated using due diligence legislation between 2010 and 2016. Due diligence regulations require affected firms to report on the steps they are taking to prevent certain abuses from taking place in their supply chains (Bayer 2016). This means that corporations are not so much obligated to prevent SSIs as they are obligated to disclose them if they are taking place anywhere in their supply chain. While this is a significant reputational risk for brand-name companies marketing to end users, it should nevertheless be considered an incremental, rather than radical, policy change, as is to be expected in phase 3. Due diligence on modern slavery is regulated by the California Transparency in Supply Chains Act (2010) and the UK Modern Slavery Act (2015) (Bayer 2016).

The other big issue that began being regulated through due diligence is that of conflict minerals, which is regulated through the Conflict Minerals Rule, or Sec-

tion 1502 of the US Dodd-Frank Act (2010); the Chinese Due Diligence Guidelines for Responsible Mineral Supply Chains (2015) (Bayer 2016); and the EU conflict minerals legislation, which passed trilogue negotiations in November 2015 and will come into force starting in 2021 (Thomas 2016).

Even though we consider these regulations to be incremental rather than radical, their significance nevertheless becomes obvious by the industry's response to the passage of the Conflict Minerals Rule in the US. Shortly after it became effective in November 2012, the US Chamber of Commerce, along with the Business Roundtable and National Association of Manufacturers, challenged the Rule before a US court (Thomas 2013). While most of the original Rule was upheld, the court found the requirement for companies to publicly "state on their websites that any of their products have "not been found to be 'DRC conflict free'"" (Thomas 2014) to be in violation of the US First Amendment, so that this requirement was stricken.

The attempt to prevent the Conflict Minerals Rule from going into effect is a classic industry reaction of phase 4: "Because the new policies affect 'primary involvement arenas' (e.g. requiring firms to meet new standards), […] industry actors use political strategies to oppose policies and hinder implementation" (Geels, Penna 2015, p. 71). However, as this is the only indicator for Phase 4, we view these actions as outliers in a time period that otherwise conforms to the characteristics of phase 3.

Apple has seized the issue of conflict minerals as an opportunity to distinguish itself as an early forerunner and even most NGOs agree that Apple is doing well in this area. The company initially joined the Conflict-Free Smelter Initiative in 2010 and began compiling a list of smelters and refiners involved in its supply chain in 2013. After partnering with a large number of organizations working on the conflict minerals issue, including the Indonesian Tin Working Group, the Enough Project, ITRI's Tin Supply Chain Initiative and Solutions for Hope, Apple announced a milestone accomplishment in early 2016:

> "As of December 31, 2015, after five years of devoted effort, 100% of the identified smelters and refiners in Apple's supply chain for current products were participating in an independent third party conflict minerals audit ("Third Party Audit") program. […]

> While this is an important milestone, and may be viewed by some companies as grounds to declare themselves "conflict free," Apple does not believe that Third Party Audit program participation alone is sufficient to label products "conflict free." Apple believes it has more work to do. In 2016, Apple is turning its attention to two key areas: enhancing due diligence in the gold supply chain and helping improve local incident reporting and issue resolution" (Apple 2016).

The decision not to declare its products 'conflict-free' earned Apple high praise from the leading conflict minerals NGO Global Witness: "This decision is a big deal. It highlights the very significant distinction between attaching a "conflict free" declaration on products and the need for an ongoing process of supply chain checks, known as due diligence. It is a welcome progression from words to action" (Oboth 2016).

As is expected in phase 3, Apple's responses both to the issues of child labor and conflict minerals and general willingness to increase the transparency of some of its operations may be seen as an example of an early-mover regime actor beginning to invest in somewhat more radical alternatives during phase 3 and causing some tension inside the closed industry front.

Finally, as is predicted by the DILC model, phase 3 has also seen the emergence of a small niche market with radical alternatives that cater to the demands of moral consumers. The first niche actor was NagerIT e.V., founded in 2009. Following its mission statement, "Encouraging humane working conditions in the factories of the electronics industries", the non-profit organization manufactures computer mice and uncovers the many different actors and firms in its small supply chain. This is a lengthy and ongoing process, as can be seen on its website (Nager IT 2016b).

Nager IT has been an important pioneer, but to date it has stayed relatively small, both in terms of its sales (roughly 10,000 mice by the end of 2016 (Nager IT 2016a)) and the amount of public attention it receives.

Undoubtedly the most successful niche actor in the fair IT sector so far has been the Dutch social enterprise Fairphone, with its smartphone of the same name. The rather unlikely story of its success has been described in detail in many other sources (Akemu et al. 2016; Best 2014; Hartmann 2014; Joshi, Cerratto-Pargman 2015; Vinter 2015; Wernink, Strahl 2015), so that only a few key points will be repeated here.

What started out as a simple awareness raising project for conflict minerals in 2010 (Wernink, Strahl 2015) turned almost accidentally into a company manufacturing smartphones, as a series of actors from the Dutch business community heard of the (purely hypothetical) idea of a conflict-mineral free phone. "Within the month [of March 2011], [a mobile network operator] agreed to buy 1,000 non-existent fair smartphones" (Akemu et al. 2016, p. 855) and a large bank gave the campaign money to begin work on their new product. Suddenly, "the Fairphone team with no smartphone prototype, no intention to start a business

and no expertise in the smartphone industry, had gained significant support" for a project they had not even really decided to do yet (Akemu et al. 2016, p. 855).

After a year of significant ups and downs (2016), Fairphone began a crowdfunding campaign in May 2013 and announced that it would go into production if it managed to sell at least 5,000 phones in four weeks (Wernink 2013). Instead, they "sold 10,000 handsets in three weeks of a phone that didn't yet exist, from a company that had existed only a month, with no track record" (Vinter 2015). In the end, the company sold 60,000 units of its first smartphone model (Fairphone 1/1U) (Vinter 2015), which shipped to customers with a postcard reading "Failphone" to point a little ironically to its own continuing shortcomings (Hartmann 2014).

But as far from truly fair as the Fairphone 1 was (Leonhardt 2014), it did achieve a number of important accomplishments: "we sourced tin and tantalum from conflict-free mines in the DRC, started a worker-controlled Welfare Fund at our manufacturer in China, contributed to an e-waste collection scheme in Ghana, [and] set up a phone Recycling Program" (Wernink 2014). Both Nager IT and Fairphone believe that it is important to continue sourcing from conflict areas and manufacturing in countries with poor labor rights situations. Rather than boycotting these regions, they want to work on improving the circumstances onsite in order to provide local workers with a source of income that comes, increasingly, with dignified working conditions and respect for their rights. Having to make do with small-step improvements is thus an inevitable part of the process.

Fairphone accomplished a few further steps with its second model, the Fairphone 2, delivered to customers as of late 2015. Perhaps most notably, the Fairphone 2 was the first modular and easily repairable smartphone on the market, a feat that brought it significant industry attention, especially as market giant Google struggled with – and soon thereafter gave up on – its modular Project Ara (Amadeo 2016).

While Fairphone has struggled throughout 2016 with delayed deliveries and its customer support has at times been completely overwhelmed (Lempers 2015; Mier 2015; Stoop 2016), these problems are primarily an indicator of the company's success to date. Customers are willing to pay a significant amount of money to get what is technically at best a mid-range smartphone, in exchange for knowing that their purchase is making the smartphone industry more fair, one step at a time. As a result, the Fairphone 2, originally only sold online on

the company's own website, is now available for purchase through mobile service providers in at least five European countries.

Both the company and its founder received recognition on a larger stage in 2016: van Abel was awarded the prestigious German Environmental Award (DBU 2016) and the Fairphone 2 was the first smartphone to be certified with the Blue Angel environmental label (Der Blaue Engel 2016).

5 Behavioral Analysis: Results from Expert Interviews

Both the quantitative and qualitative analysis in Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.** have shown that a slow but steady transition toward greater social sustainability in the smartphone sector is in progress. However, in spite of the presence of trigger events, increased media reporting and public awareness, neither most incumbent regime corporations nor their consumers have thus far fully embraced the need to ensure better working conditions and more socially sustainable production environments in global smartphone production networks.

Against the backdrop of this analysis, this chapter now seeks to describe the underlying drivers and barriers that have so far prevented the transition process from progressing past phase 3. These insights are based on the expert interviews, in which we focused more explicitly on corporate and consumer behavior through the lenses of the C-CADM (corporate behavior, Figure 7) and SSBC model (consumer behavior, Figure 8).
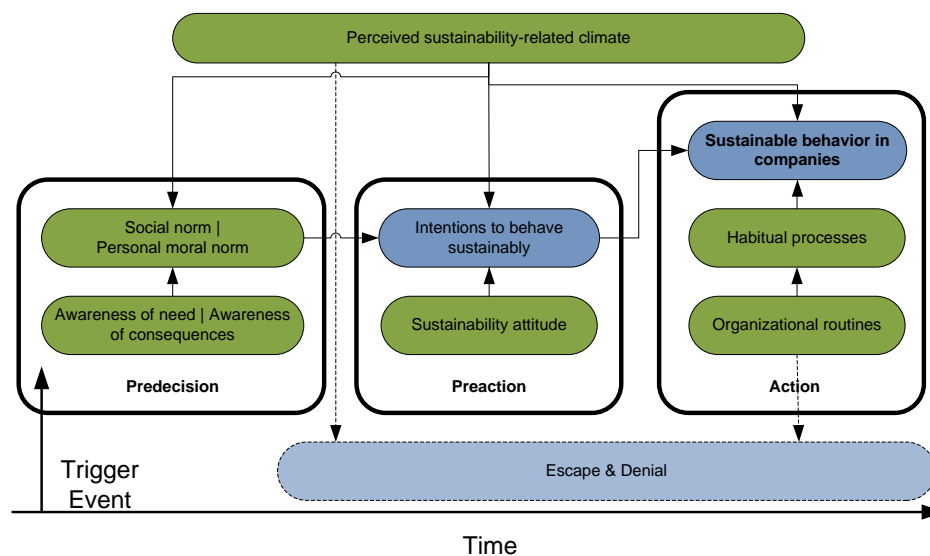

Figure 7: C-CADM model (Bodenheimer 2016a; adapted from Lülfs, Hahn 2014)

Our goal was to answer the overarching question: "Why are issues of social sustainability in the smartphone industry not being addressed more actively by corporations and consumers?" We broke this query down further into a series of

guiding questions aimed at identifying 'sticking points' in the SSBC/C-CADM models:

1. In your opinion, are brand-name manufacturers already aware of these issues?
2. Do you think brand-name manufacturers are already addressing some of these issues?
3. In your opinion, are customers already aware of these?
4. Do you think that customers are taking their awareness of these issues into account when making smartphone purchasing decisions?
5. How would you assess the market prospects of smaller (niche) firms in the short-, medium-, and long-term? Why?
6. In your opinion, what prerequisites or conditions are necessary to further advance issues of social sustainability in the smartphone sector?
7. In your opinion, what obstacles are currently preventing greater social sustainability in the smartphone sector?

The results will be presented and analyzed below. We will first focus on corporations and then discuss consumers. For each group, we divide our analysis into awareness, which includes trigger events, the predecision stage and the perceived sustainability-related climate (corporations only), and behavior, where we discuss the preaction and action phases as well as escape & denial.
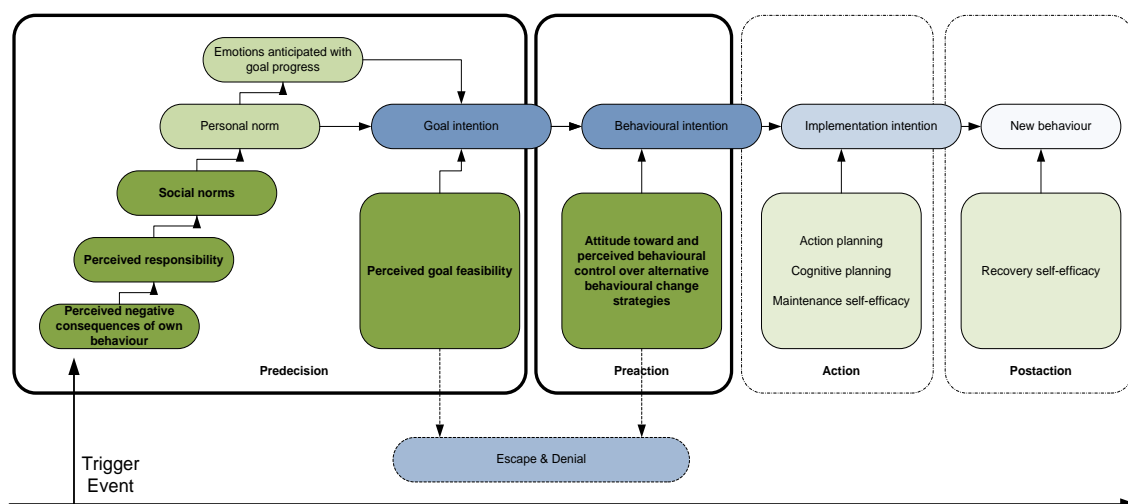

Figure 8:   Adapted SSBC model (adapted from Bamberg 2013; Bodenheimer 2016a)

5.1 Corporations

5.1.1 Corporate Awareness

All experts agree that, given the significant amount of media and NGO attention paid to these issues over the last two decades, all brand-name smartphone manufacturers are *generally* aware of SSIs by now. Various events, especially the Foxconn suicides and accusations of child labor, have made the topic strongly scandal-driven. Corporations whose monetary value is deeply rooted in their brand recognition have a significant intrinsic interest in protecting their reputations from the negative consequences of such scandals and therefore can no longer afford not to be aware. This supports the assertion that the transition is currently in phase 3, where public attention has risen significantly and firms are strongly engaged in how an issue is publicly framed.

Nevertheless, the experts identified some areas in the supply chain that may still be blind spots as well as structural problems with where awareness exists inside a company's hierarchy. First, awareness of working conditions decreases as one moves upstream in the supply chain. Brand-name companies are certainly aware of issues with their direct suppliers, but less so with component manufacturers, for example. And while most companies address the issue of conflict minerals, working conditions (i.e. health, safety, wages), especially in artisanal mining, are hardly discussed. However, the creation of the Indonesia Tin Working Group and the newly formed Responsible Cobalt Initiative may indicate that this is beginning to change.

Second, the greatest awareness of SSIs tends to exist among those working in the Corporate Social Responsibility (CSR) department, which is often part of the Public Relations or marketing department and not present during strategic decision-making processes regarding procurement and supplier management. CSR managers may have extensive knowledge of SSIs, but lack the necessary clout to make substantive changes in company policy. Moreover, because their departments are generally charged with generating a positive company image, CSR reports are often overly superficial. Few companies, with the notable exception of Apple, dare to openly acknowledge significant CSR problems in their supply chain.

In general, experts agree that there have been enough trigger events for companies to have the ***awareness of need and consequences*** necessary for the ***predecision*** stage of the C-CADM model (Figure 7). Their PR efforts and con-

cern for their reputations also shows that they are aware of **social norms** that condemn poor working conditions and other SSIs in smartphone supply chains.

5.1.2   Corporate Behavior

Because of where awareness is located within corporate hierarchies, many experts argue that an assessment of corporate actions needs to distinguish between communication about versus actual implementation of sustainability-oriented policies. Most brand-name manufacturers publish sustainability reports, but these formats are oriented towards an expert audience and not obviously advertised on corporate websites.

In their regular marketing materials, brands hardly mention sustainability issues. From this, one expert deduces that there cannot be a demand from customers for this information, since brands would otherwise have an economic interest in including it. While customers can access brands' sustainability reports, this requires both additional effort and a specific, preexisting interest in questions of sustainability.

A second issue some experts criticize is the superficiality of sustainability reports as well as certain contradictions found therein. Reports often include long lists of sustainability initiative memberships, but fail to address the complex issues involved in the implementation of solutions. For example, a report might state that a certain percentage of workers are members of a union and thus imply that their right to freedom of association is being safeguarded. However, there have been many reports of unions that are either steered entirely by company management or by the government, such as the controversial All-China Federation of Trade-Unions, and that any attempts at creating 'real' employee-organized unions are quickly suppressed (see e.g. Cardinal 2016). Furthermore, assertions in sustainability reports are often contradicted by corporate lobbying: companies whose sustainability reports state that they want to combat the use of conflict minerals are at the same time fighting binding EU conflict minerals regulation or the implementation of the US Conflict Minerals Rule.

Regarding the actual implementation of standards, many experts criticized that brand-name companies often only interact with first-tier suppliers and expect these to pass sustainability and labor rights standards up the supply chain in turn. However, most mid-tier suppliers lack the resources (both financial and human) to implement these standards while simultaneously meeting the deadlines and competitive price expectations set directly or indirectly by brand-name

companies. Many brand-name corporations also argue that they cannot enforce standards throughout the supply chain, because they do not know who the suppliers beyond the first-tier are. Nevertheless, they manage to dictate specific components and technical standards for their products throughout the supply chain. Moreover, small enterprises like Nager IT and Fairphone, whose resources are negligible in comparison to those of large brand-name companies, have managed to go deep into their supply chains and uncover quite a few of their suppliers.

With regard to the **preaction** stage of the C-CADM, therefore, it seems that at the moment many corporations are more interested in *appearing* to behave sustainably than actually intending to do so. This implies that they perceive the **sustainability-related climate** to be growing somewhat stronger, but their own **sustainability attitude** is still significantly lower on their list of priorities than other factors, such as price/profits and production speed. This status is not precisely the same as the C-CADM's **escape and denial** and leads us to think that brand-name companies in the smartphone industry are currently 'stuck' in the **preaction** stage – too aware of sustainability issues to choose escape and denial, but not willing enough to commit themselves to **sustainable behavior** to truly move on to the **action** stage, with a few minor exceptions.

5.2   Consumers

5.2.1   Consumer Awareness

Asked what percentage of smartphone users they think is aware of SSIs in the industry, the experts' answers varied extremely, from 20% to virtually everyone. Experts familiar with organizational procurement have noticed an increase in awareness over the last years by large institutional customers like universities and governments. This increase is particularly attributed to the work of the NGOs GoodElectronics and Electronics Watch.

Focusing in on those consumers who do have some awareness that there are social problems associated with the production of their smartphones, the experts agreed that poor working conditions in factories and the issue of conflict minerals are the most well-known. The latter, however, is a complex topic and while general awareness is increasing, many non-experts do not fully understand what it involves. For example, many people believe that 'conflict-free minerals' are also produced under fair working conditions, which is often not the case. Nevertheless, one clear benefit of the media attention on conflict minerals

has been that it has made most consumers more strongly aware of the fact that their electronic devices are made up of many different natural resources and that their exploitation is not without problems.

As to how customers' awareness comes about, experts pointed to media coverage of trigger events, like the Foxconn suicide wave, as well as coverage of the Dodd-Frank Act and EU conflict minerals regulation. Also helpful have been an increase in films and documentaries, both on factory working conditions and resource exploitation, several museum exhibitions and the inclusion of these topics in school curricula.

Finally, one expert pointed out that many consumers are not as concerned with working conditions – in general, not just regarding smartphones – because they do not have any direct impact on their lives. This makes it more difficult to motivate customers to care in comparison with other sustainability issues, like the use of potentially noxious chemicals in the production of clothing.

Ultimately, three different consumer groups can be distinguished: those who are not aware of SSIs in the smartphone sector; those who are aware of these issues but do not see them as a high personal priority; and those that we refer to as "moral consumers", who are not only aware of the issues but are also willing to prioritize them above other potentially relevant factors. The first of these groups has not begun the process of self-regulated behavioral change described by the SSBC model (Figure 8). The second group has registered some or all of the *trigger events* described in Chapter 4 and thus enters the *predecision* stage*,* where they perceive the *negative consequences of their own behavior*. To what extent this group *perceives responsibility* for these consequences or whether their awareness activates any *social or personal norms* cannot be determined without further research. The group of moral consumers *perceives responsibility* and their *personal norms* are definitely activated, so that they are next confronted with an evaluation of the (perceived) goal feasibility.

5.2.2   Consumer Behavior

There are several different strategies that consumers can employ to reduce the negative consequences of their mobile phone use, including continuing to use old, but still functional non-smartphones (often referred to as 'dumb phones'); purchasing used smart- or dumb phones; or purchasing a phone from a niche

actor seeking to actively improve the conditions in the supply chain, where Fairphone is currently the most prominent.

In discussing what is preventing consumers from changing their behavior through one of these alternatives, the experts cited a series of different plausible explanations. First, some people do not want to add another product category to the list of consumption areas where they take sustainability into consideration. Because problems of social sustainability in the supply chain are also very far away for most consumers, it is often easier and more comfortable to return to ignoring these problems as soon as the latest trigger event has disappeared from the daily news (***escape & denial***). Mobile phone service providers add to this temptation by offering attractive financing deals for a new smartphone every year or two. For many people, in particular young consumers, smartphones are also important status symbols and there is significant social pressure to always keep up with the latest trends. In this case, ***social norms*** do not motivate individuals to change their behavior towards something more sustainable, but rather to do quite the opposite.

Even for those consumers who are generally open towards making their behavior more sustainable, there are a series of obstacles. First, it takes time and effort to do the research necessary for comparing brands on social sustainability criteria, since most companies do not provide these facts in such user-friendly formats as are available for the technical specifications of a smartphone. Then there are simply very few alternatives available: Fairphone is the only smartphone manufacturer whose claims to greater sustainability are uncontested. However, considering the technical standards of the Fairphone, it is quite expensive and likely does not meet every consumer's technical requirements. Finally, for a long time Fairphones were only available either through lengthy crowdfunding campaigns, where the price had to be paid many months in advance of receiving a new phone, or through various e-commerce options, where touching and testing the phone in real life was not possible prior to purchase. This last point is becoming less relevant as Fairphone has begun cooperating with mobile phone service providers in various different European countries that carry the phones in-store.

With regard to the SSBC model, only two of the consumer groups discussed above are left to analyze here: moral consumers and those that are aware of negative consequences but not willing to act upon this awareness. Moral consumers are aware of the alternative strategies described above and thus ***perceive the goal*** of more sustainable mobile phone consumption to be ***feasible.***

They form a ***goal intention*** and move onto the ***preaction*** stage. Here they evaluate the various ***alternatives*** and choose one that they consider to be within their control or, if multiple alternatives fall into this category, the one that they most prefer. This leads to the formation of a ***behavioral intention*** and leads into the ***action*** stage, where the behavior is implemented.

For the second group, those that are aware of negative consequences of their consumption behavior but do not make behavioral changes, any of the factors described above might lead to ***escape & denial*** for these consumers, who are likely quite heterogeneous.

6   Conclusion

Based on findings from both the quantitative and qualitative process analysis, the following issue lifecycle phases can be identified:

- Phase 1 (1994 – 2005): problem identification and definition;
- Phase 2 (2006 – 2009): social movement formation and defensive industry response;
- Phase 3 (2010 – present): public discussion and framing, formation of a market for moral consumption and industry hedging.

The progression through the first three phases of the Dialectic Issue Lifecycle Model indicates changes are taking place that could eventually lead to a transition. Trigger events such as the suicide wave at Foxconn or the Conflict Minerals Rule of the U.S. Dodd-Frank Act increased public awareness of social sustainability issues in the current smartphone regime significantly and have led to the creation of a niche market for moral consumers in the form of social enterprises like Fairphone. Incumbent regime actors like Apple and Samsung appear to be feeling greater pressure on SSIs, but are employing differing strategies in response. While Samsung continues to react defensively to accusations from NGOs, Apple may be trying to gain an early-mover advantage on select issues such as conflict minerals by publicizing efforts to go beyond minimum requirements.

Nevertheless, the transition to greater social sustainability in the smartphone sector is far from complete. Our examination of behavioral drivers and obstacles shows that early niche suppliers and 'moral consumers' play an important role by proving the existence of and demand for more sustainable alternatives, even in a high-tech sector with rapid innovation cycles like the smartphone industry. Nevertheless, experts agree that consumers cannot bear the ultimate responsibility for moving the transition forward, because both GPNs and associated problems are too complex to enter into the average consumer's decision-making process. Instead, incumbent regime actors must take social sustainability issues into serious consideration when making strategic management decisions and enforce compliance throughout their entire GPN. Most experts agree that this requires binding due diligence regulations that creates a level playing field for all and both *forces* and *allows* incumbent regime actors to change their behavior.

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