

Tracking Green Brand Reputation in Real Time: A Theory-Driven Social Media Approach

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Abstract

Brands with an environmentally friendly reputation gain a competitive advantage among increasingly eco-conscious consumers. However, most brand reputation measures rely on periodic surveys and do not capture the environmental dimension of reputation in real time. Building on green brand equity theory, we develop a green brand reputation tracker that leverages social media to monitor how people perceive brands' environmental commitments in real time. The tracker measures stakeholder opinion at the three levels drawn from the theory: green brand image, green satisfaction, and green trust. We construct driver-specific dictionaries through expert review and apply them to longitudinal monthly X data for companies in the Clean200 report by Corporate Knights and As You Sow, which ranks publicly traded companies on their contribution to the clean energy economy. A preliminary analysis of 53 brands in 2021, covering 636 brand-month observations, shows that the tracker captures brand engagement, sentiment toward each green driver, and reputation dynamics over time. Notably, our reputation-based ranking differs considerably from the Clean200 ranking. Some companies with high sustainable revenue, such as Apple and Tesla, are not perceived as green by stakeholders. We discuss how the tracker can help firms monitor and manage their green brand reputation and outline the next steps of the research, including linking green brand reputation to firm clean revenue.

Keywords: Green brand reputation, green brand equity, social media analytics, brand tracker, sustainability, X

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1. INTRODUCTION

Environmental and sustainability concerns are now at the center of public attention, and companies are expected to respond with specific green commitments (Flores-Hernández et al., 2020). Firms can be environmentally friendly by various actions, including reducing their carbon footprint and harmful emissions, using renewable energy, and adopting other eco-friendly practices. These practices can strengthen a company's reputation among consumers and employees, and specifically what we call its green brand reputation. Firms of all sizes have implemented numerous earth-friendly initiatives, and people are increasingly aware of these efforts and concerned about the environmental footprint of the brands they support. Nowadays, people are more conscious of the effect of their everyday decisions on the earth and might prefer to buy coffee from a cafe committed to reducing waste and using recyclable products, or to buy clothes from brands that prioritize recycled materials.

Social media has become the main place where people share their impressions of everything, including brands. As a result, it is now easier for people to engage with brands' sustainable initiatives and share their personal opinions about them. To build and protect a green reputation, brands need to monitor how people perceive their environmental actions on social media (Singh et al., 2020).

A rich literature exists on measuring and understanding brand reputation, but comparatively little work has examined green brand reputation (Argenti & Druckenmiller, 2004; Keller & Lehmann, 2006; Shams, 2015; Zhao et al., 2021). In this study, we develop a theory-driven, real-time green brand reputation tracker based on user-generated social media content. The tracker builds on green brand equity theory from the marketing literature, which captures people's opinions toward brands at three levels: green brand image, green satisfaction, and green trust (Chen, 2010). By analyzing the internal relationships among these three drivers, we can also determine which driver most strongly affects green brand reputation. In its design, the tracker follows the social media brand reputation tracking approach introduced by Rust et al. (2021) and extends it to the environmental domain. Companies can use the tracker to monitor the real-time effects of their actions, improve or sustain their eco-friendly image, and compare themselves with competitors.

The tracker uses longitudinal monthly X data for the top 200 green companies. The companies come from the Clean200 report by Corporate Knights and As You Sow, which ranks publicly traded companies by their contribution to the clean energy economy based on revenue from clean sources and overall carbon footprint. Once the tracker produces green brand reputation measures for the selected brands, we plan to analyze the relationship between green brand reputation and the firm's clean revenue. We also rank the brands by our green brand reputation measure and compare the result with the Clean200 ranking.

Our current analysis covers 53 of the 200 brands in 2021. Interestingly, our final ranking and the Clean200 ranking do not align. Some brands are not perceived as green as their sustainable revenue suggests, and people may be unaware of their environmental activities. For example, Apple and Tesla generate high sustainable revenue but score among the weakest green brands from the stakeholder perspective. This finding has practical implications for companies working to improve their green brand reputation.

The study makes several contributions. First, to the best of our knowledge, it develops the first theory-driven green brand reputation tracker based on social media. It contributes to both the marketing and information systems literature. Second, it advances the green brand equity literature by applying and testing a known green brand equity model in a social media setting with a large volume of posts, whereas prior work relied mainly on surveys. Third, it is the first paper that conceptualizes the relationship

between green brand reputation and green brand equity. The work also adds to the sustainability literature, and the resulting longitudinal dataset will be publicly available for future research.

2. LITERATURE REVIEW

2.1 Brand Equity

Brand equity is one of a firm's most valuable assets and a fundamental topic in the marketing literature (Chen, 2010; Rojas-Lamoren et al., 2022). Keller (1993) describes brand equity as a set of associations that develop between a brand's attributes and the benefits its customers perceive. Mohd et al. (2007) similarly treat brand equity as an intangible property of the brand, the intrinsic value concealed in the brand name. The concept refers to the added value that a given brand lends to a firm's products. Brands with high equity present better profit margins, communicate more effectively, and play a significant role in consumer preferences and purchase intention (Rojas-Lamoren et al., 2022).

Two brand equity models are widely accepted, along with combinations of the two. Aaker identified five dimensions of brand equity: brand loyalty, brand awareness, perceived quality, brand associations, and other proprietary brand assets (Aaker, 1996). Keller (1993) chose brand knowledge, brand awareness, and brand image as the dimensions of brand equity. The literature includes many models built on these two. Rojas-Lamoren et al. (2022) review thirty years of brand equity research and report 25 different models and measures between 1991 and 2019. One is the green brand equity model proposed by Chen (2010), one of the field's most cited articles.

Scholars mainly focused on green brand equity between 2010 and 2021 (Górska-Warsewicz et al., 2021). Based on the systematic literature review by Górska-Warsewicz et al. (2021), 11 determinants of green brand equity have been identified, with image, trust, value, satisfaction, and loyalty as the most studied drivers, compared with quality, awareness, attributes, specific promotional activities, and purchase behavior. Chen (2010) argued that green marketing increases a firm's intangible brand equity because it helps the firm comply with environmental pressures, gain a competitive advantage, improve its brand image, seek new market opportunities, and boost product value.

2.2 Green Brand Equity

Building on the models of Aaker and Keller, Chen (2010) defines green brand equity as a set of brand assets and liabilities about green commitments and environmental concerns that are linked to a brand, its name, and its symbol, and that add to or subtract from the value provided by a product or service. He proposes and validates three main constructs that drive green brand equity: green brand image, green satisfaction, and green trust. Later studies affirm this model and extend it with additional dimensions (Ng et al., 2014).

We refer to these three constructs, the antecedents of green brand equity and therefore green brand reputation, as the green drivers. Following Chen (2010), green brand image is the set of perceptions of a brand in a consumer's mind that is linked to environmental commitments and concerns. Green satisfaction is a pleasurable level of consumption-related fulfillment that satisfies a customer's environmental desires, sustainable expectations, and green needs. Green trust is a willingness to depend on a product, service, or brand based on beliefs or expectations about its credibility, benevolence, and ability regarding its environmental performance.

2.3 Brand Reputation and Green Brand Reputation

We adopt the customer-centric definition of brand reputation from Keller and Lehmann (2006), who define it as the overall perception or evaluation of a brand in the minds of customers and other stakeholders. This definition is broad because it includes everyone who can interact with the brand and express an opinion in a post, from non-customers to employees and investors.

Social media is the main ground where people freely express their impressions of brands, including their feelings, thoughts, and experiences. What stakeholders say about a brand on social media therefore offers a running summary of the overall impression the brand leaves (Hewett et al., 2016; Rust et al.,

2021). Brand reputation is also a dynamic construct that evolves due to internal and external factors, such as changes in the competitive environment and marketplace, changes in consumer preferences, and the firm's own actions and decisions (Rust et al., 2021). Because reputation changes over time, it is manageable, and a tracker that captures these changes in real time becomes valuable.

Brand equity and brand reputation are closely related. Wang et al. (2021) find a positive effect of brand equity on brand reputation, so brand equity can be considered an antecedent of brand reputation. Sözer et al. (2017) also report positive relationships within the consumer-based brand equity dimensions and a strong relationship between brand loyalty and brand reputation. Rust et al. (2021) draw a related connection between brand reputation and customer equity, since the same equity drivers shape both constructs and link them to the firm's financial performance.

Researchers have measured brand reputation mainly through stakeholder surveys (Argenti & Druckenmiller, 2004), with a few recent attempts to measure the concept by analyzing user-generated content on social media (Rust et al., 2021). To the best of our knowledge, no study has measured green brand reputation through social media. In this study, we define green brand reputation as the overall perceived evaluation of a brand's activities and commitments toward environmental sustainability in the minds of customers and stakeholders.

2.4 Brand Reputation and Financial Performance

Marketing performance can be measured with financial and non-financial measures (Clark, 1999; Gao, 2010). Brand equity, customer loyalty, and satisfaction are non-financial measures that serve as a company's intangible assets. Stewart (2009) categorizes the returns on marketing activities into short-term effects, long-term effects, and real options, and places brand equity under the persistent, long-term category. Measuring brand equity is a major research stream in marketing performance measurement (Gao, 2010).

Accounting measures alone cannot fully explain firm value because they do not capture all the hidden benefits of intangible assets such as brand equity (Mizik & Jacobson, 2008; Srivastava et al., 1998). The most common approach to firm value relies on financial performance, which can be analyzed through revenue, profit, and stock return (Krasnikov et al., 2009). We choose brand reputation as the marketing performance measure of interest and clean revenue as the financial measure, given the availability of clean revenue data for our sample. In the next stage of this research, we will study the relationship between green brand reputation and the firm's clean revenue.

3. BUILDING THE GREEN BRAND REPUTATION TRACKER

We aim to build a theory-driven, social media-based green brand reputation tracker that produces real-time measures. To this end, we use green brand equity as the tracker's underlying theory and X as the social media platform. We build the tracker in four steps.

3.1 Establishing a Three-Driver Tracker

Our green tracker is founded on the green brand equity framework (Chen, 2010), the only brand equity model that addresses green and environmental concerns through three green drivers. These drivers capture the value customers perceive from choosing green brands through the green brand image, which in turn affects their level of satisfaction and trust.

We chose this framework for three reasons. First, environmental threats and consumer awareness of green branding continue to grow (Górska-Warsewicz et al., 2021). The focus of green marketing has shifted from the positive and negative effects of marketing activities on pollution and energy in the 1970s to a tool for sustainable development and for building a strong green brand image (Górska-Warsewicz et al., 2021). Second, many studies have validated and empirically tested the framework using surveys and experiments across industries and countries. Third, the drivers are linked to return on green marketing, connecting green brand equity to financial performance measures such as firm clean revenue.

3.2 Developing the Driver Dictionaries

Appendix A summarizes the green drivers, their definitions, and the proposed dictionaries. For the preliminary analysis, we used expert review to identify the specific keywords people use when posting about a brand while considering its green behavior. Our expert subjects were 25 Ph.D. students and faculty members with familiarity with the topic.

We first gave the experts a definition of green brands. We then asked them to imagine a scenario in which they had recently interacted with a brand they consider green, meaning that they view its activities as helpful to the environment and as demonstrating sustainability commitments, and to list at least five keywords they would use to describe such a brand. We then used every keyword repeated more than twice as an initial keyword for filtering posts on green concepts.

Next, we built positive and negative dictionaries for each green driver. We defined each driver for the participants, asked them to list positive keywords related to a positive interaction with a green brand for that driver, and then asked them to imagine a negative interaction with a brand and list the related negative keywords. Based on the responses, each driver's dictionary includes keywords listed by at least two participants. Where our drivers overlap conceptually with those of Rust et al. (2021), such as trust, we also drew on their validated dictionaries. We adapted the relevant keywords to the green context, so that the final dictionaries combine expert input with terms whose validity has been established in prior work.

3.3 Choosing the Social Media Platform

People express their impressions of brands and events on several platforms, including Instagram, Facebook, and X. For this study, X has three advantages. First, most brands are active on the platform, making brand conversations convenient and real-time. Second, most user accounts are public, making it easier to access stakeholders' opinions and reflecting a broader impact on public perception of brands. Third, at the time of data collection, the platform offered an API for downloading posts with academic access.

3.4 Choosing the Brands to Monitor

We use the Clean200 global company list. Since 2016, Corporate Knights and As You Sow have reported a global list of 200 publicly traded companies that are prominent leaders for a clean energy future. We use the 2023 report, which includes the top 200 public companies with more than 10 percent sustainable revenue in 2021. The list covers ten sectors, including information technology (34 brands), industrials, materials, utilities, healthcare, financials, communication services, and real estate.

3.5 Collecting Posts

With the company list in hand, we identified each company's X username by searching for and monitoring its primary handle. Using the academic access to historical data available at the time of collection, we ran a streaming API collection of all posts mentioning the handle. We retrieved the posts and stored them in a database that we will make publicly available.

4. PRELIMINARY EMPIRICAL ANALYSIS

4.1 Data

The data for this study come from two sources. The first source is the Clean200 report by Corporate Knights and As You Sow, which lists the top 200 global clean brands, their rankings, and their 2021 clean revenue. The second source is X (Twitter at the time of data collection). We identified 56 Clean200 brands with a single official, primarily English-language X handle, consistent with our English-language dictionaries, and completed the full 2021 collection for these brands. Because monthly driver scores become unreliable at very low volumes, we excluded brands with fewer than 100 green posts over the year; this criterion excluded three brands, which appear only in Appendix C. The remaining 53 brands

form the scored sample reported in Appendix B. The dataset covers each brand monthly from January 2021 to December 2021, resulting in a panel of 636 brand-month observations. For each brand and month, we measure the volume and the sentiment of each green driver. Table 1 reports descriptive statistics for the drivers and overall green brand reputation; Appendix B reports the resulting green brand reputation scores and rankings; and Appendix C reports post volume by brand.

4.2 Brand Engagement

Based on the collected data, we measure the monthly post volume for each brand, which shows how involved stakeholders are with each brand over time. In the preliminary dataset, the average number of posts collected per brand is 284,639 (SD = 170,297; min = 178; max = 992,502), which supports our choice of social media as a source for collecting stakeholder opinions about brands. This measure varies widely across brands. For example, Tesla averages about 83,000 posts per month, while some brands, such as Bristol, average only 17 posts per month. Comparing the average post volume across drivers in Table 1, the green brand image and green satisfaction drivers show higher volume than the green trust driver.

Variable	Net volume (SD)	Positive volume (SD)	Negative volume (SD)	Sentiment ratio (+/-)
Green brand image	1,275 (2,362)	1,708 (3,459)	433 (1,207)	3.95
Green brand satisfaction	1,216 (2,869)	1,390 (3,336)	174 (470)	7.98
Green brand trust	350 (930)	485 (1,201)	135 (314)	3.59
Green brand reputation	947	1,194	247	4.83

Table 1. Post Volume and Sentiment of the Green Drivers

4.3 Brand Sentiment

To get a general idea of stakeholder attitudes toward brands with respect to the green drivers, we calculate the sentiment ratio, the proportion of positive to negative posts, at the overall green brand reputation level and at the driver level. As Table 1 shows, the sentiment ratio is positive for all drivers and highest for green satisfaction.

4.4 Monitoring Brand Dynamics and Competition

The tracker helps monitor several aspects of brands over time, such as brand events, brand fluctuations, and competitive dynamics at different levels. Figure 1 plots the time series of calculated green brand reputation for selected brands, namely the six highest-ranked brands based on their green brand reputation score (IBM, Intel, VMware, SAP, Cisco, and Pfizer) and four brands with scores among the lowest (HP, Tesla, Apple, and Capital One). The figure shows real-time fluctuations in green brand reputation, enables trend comparisons across brands, and highlights the events behind those trends. Figure 2 compares Intel and Tesla directly, and Appendix D presents additional pairwise comparisons between brands. Appendix B reports each brand's average monthly score over 2021, which makes the cross-brand comparison in Figure 1 precise.

The pronounced movements in Figure 1 correspond to identifiable brand events. Apple's sharp March 2021 peak coincides with its March 31 announcement that more than 110 suppliers had committed to 100 percent renewable energy. This event sensitivity supports the tracker's accountability, since the measure moves when stakeholders discuss concrete environmental actions. A systematic event study of these dynamics is part of the next stage of this research.

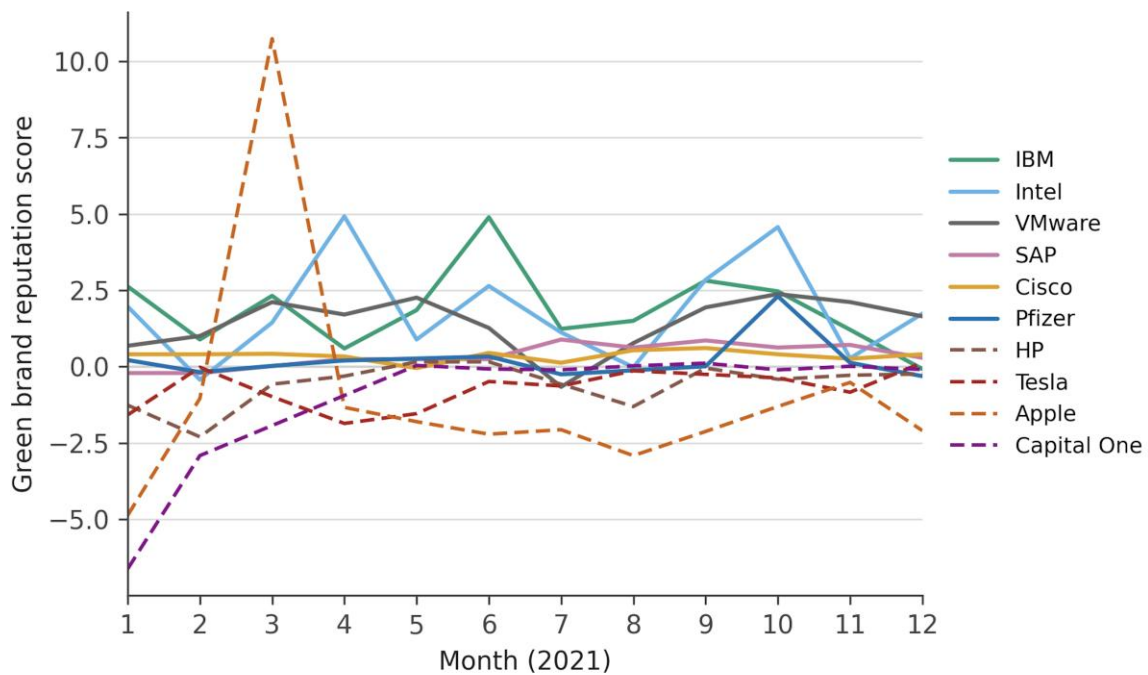


Figure 1. Time Series of Green Brand Reputation for Selected Brands

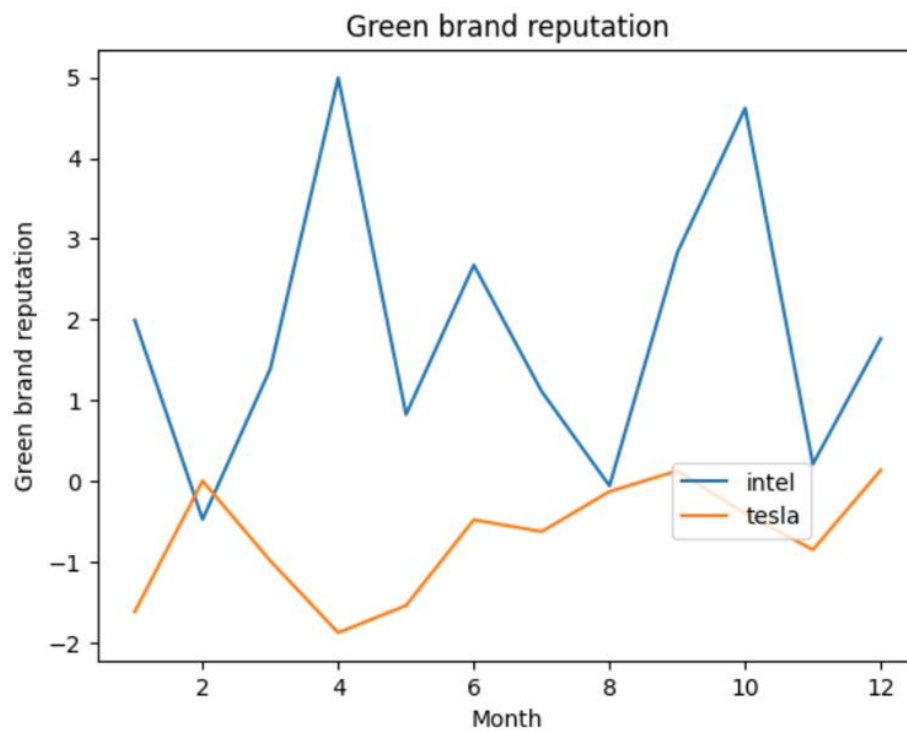


Figure 2. Green Brand Reputation of Intel and Tesla over 2021

4.5 Green Brand Reputation Scores

Appendix B reports the green brand reputation scores and rankings for the 53 brands next to their Clean200 rankings. Our ranking, which reflects stakeholder views, differs considerably from the Clean200 ranking, which reflects sustainable revenue. Several insights follow from this comparison. How green people perceive a brand to be is not necessarily related to the brand's actual practices toward its green commitments. Some companies with high sustainable revenue, such as Apple and Tesla, are perceived as weak green brands from the consumer perspective.

This discrepancy matters for interpreting green performance. Rankings built on clean revenue capture what firms do, while our measure captures what stakeholders believe firms do, and the two are conceptually distinct. A brand that ranks high on revenue but low on perception, such as Apple or Tesla, either is not communicating its environmental record effectively or sees that record discounted because unrelated controversies spill over into green perceptions. The reverse pattern, a brand perceived as greener than its practices warrant, is the classic greenwashing profile. The gap therefore serves as a diagnostic: it tells managers whether the problem is substance or communication, and it raises research questions, including whether the gap predicts future clean revenue and whether it narrows after sustainability communication campaigns. Once we complete data collection for all 200 companies, we will estimate the relationship between green brand reputation scores and firm clean revenue.

5. CONTRIBUTIONS AND IMPLICATIONS

We conceptualize green brand reputation and propose a measurement of this construct based on the well-defined green brand equity theory. This work adds to the green brand equity literature by applying and testing a known green brand equity model in a social media setting with a large volume of posts, whereas previous literature relied mainly on surveys. It is also the first paper to conceptualize the relationship between green brand reputation and green brand equity, and it contributes to the sustainability literature.

In practice, the divergence between perceived and actual greenness sends a clear message. Firms whose environmental activities are not visible to stakeholders can use the tracker to detect the gap and respond, for example, by communicating their initiatives more clearly and by watching how the reputation measure reacts to their actions in real time.

The longitudinal brand dataset, including all measurements, will be publicly available for researchers to conduct future studies. The dataset opens several directions for future research, including a question suggested by Rust et al. (2021): what are the within-brand and between-brand temporal volatilities and dynamics of reputation over time?

6. LIMITATIONS AND FUTURE RESEARCH

The tracker still needs to be validated by confirming its accountability, that is, whether the measures capture and represent firm-related events and whether they connect to financial outcomes. We should also address the tracker's generalizability using data from other social media platforms, such as Facebook. In addition, our data are limited to English posts, and we developed our dictionaries through expert review. In future work, we plan to update and validate the dictionaries more broadly by crowdsourcing keywords through MTurk workers, and to complete data collection for the full set of 200 companies so we can estimate the relationship between green brand reputation and clean revenue.

7. CONCLUSION

We build a theory-based green brand reputation tracker using longitudinal X data to capture how people perceive a brand as green. The tracker measures what people discuss about brands' green activities, drawn from the Clean200 report by Corporate Knights and As You Sow. It offers several benefits, such as monitoring green brand reputation over time, supporting timely managerial action, and evaluating green brand competition at the level of each driver. In our preliminary sample, the reputation-based ranking diverges from the revenue-based Clean200 ranking, suggesting that stakeholders do not always

perceive brands as green as their revenue indicates. The tracker helps companies see that gap and respond quickly to market changes.

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APPENDIX A

Green Brand Reputation Drivers, Descriptions, and Dictionaries

Initial filter with general green keywords: Sustainable, CO2, carbon footprint, environment, environmental impact, environmental commitments, Low impact, environmentally conscious, Green, climate-friendly, earth-friendly, eco-friendly, helping environment, environmental concerns, carbon-neutral, renewable, durable, energy-efficient, efficient, fewer emissions, reduce waste, recyclable, reusable, Cruelty-free, non-GMO, natural ingredients, zero waste, green initiative, biodiversity, conservation, green packaging, social responsibility, organic, responsible, proactive, footprint, circular, waste reduction, carbon dioxide savings, water saving, saving, low-pollution, pollution, helping, caring, ecological, natural materials, conscious, Positive impact, eco-initiatives, clear

Green Driver	Description	Positive Dictionary	Negative Dictionary
Green Brand Image	Are the perceptions of a brand in your mind linked to environmental commitments and environmental concerns?	Successful, professional, performance, well established, Ethical, high quality, effective, impactful, Credible, Authentic, innovative, awesome, cool, modern, inspiring, stimulative, live, interest, New, smart, invent, advance, cutting, futurist, intelligent, progress, technology, creative, novel, cutting-edge, Benevolent, giving, beneficial, reputable, responsible, leadership, customer focused, high- quality, long term value, driven, informed, strong, knowledgeable, smart, committed, concise, inspiring, cruelty-free	Greenwashing, Hypocritical, false, guilty, Poor quality, Inconsistent, unethical, Outdated, Inaccessible, Ordinary, lame, ancient, average, Boring, dull, uninspiring, tiring, bland, Old, old-fashion, traditional, uninteresting, outdated, Greedy, uncaring, irresponsible, evil, profit, silent, expensive, low quality, liar, hypocritical, misleading, inconsistent, unreliable, inefficient, polluting, cheap design, deceptive, Exploitative, profit-driven, careless, short-sighted, overpriced, Shallow commitment, Reactive, Negligent, Failure Damaged reputation, Inauthentic, Irresponsible, opportunistic, costly, monopoly
Green Satisfaction	Do you experience a pleasurable level of consumption-related fulfillment that satisfy your environmental desires, sustainable expectations, and green needs?	Aligned desires, aligned values, aligned, educating, promoting, engagement, rewarding, Delighted, Satisfied, Happy, Pleased, Impressed Grateful, Ecstatic Content, Thrilled, Excited, Impacted, Fulfilled, Motivated, Proud, delighted, involved, community, social, together, harmony, connect, thrill, Nice, friendly, pleasant, kind, warm, welcome, open, accommodate, glad, right choice, empowered, grateful, confident, Exceeding expectations, Positive	Disappointed, Frustrated, Skeptical, wrong, unhappy, Frustrated, Unsatisfied, Displeased, Angered, Cold, sad, selfish, Mean, unpleasant, unhelp, unfriendly, aloof, nasty, arrogant, distant, impersonal, disconnected, regrettable purchase, dissatisfied, betrayed, unmet expectations, superficial, inadequate communication, ineffective,

Green Driver	Description	Positive Dictionary	Negative Dictionary
		customer experience, Compromising quality, compromising user experience	
Green Trust	Are you willing to depend on a product, service, or brand based on the belief or expectation resulting from its credibility, benevolence, and ability about its environmental performance?	Honest, reliable, good, depend, trust, transparent, safe, honesty, principle, honor, trustworthy, credibility, genuine, authentic, capable, competent, benevolent, integrity, fair trade, charitable, demonstrable results, proven record, record, consistent, sincere	Dishonest, unreliable, cheat, shady, untrustworthy, deceit, inconsistent, exaggerated, false, vague, questionable, inadequate, incapable, incompetent, unmerciful, insincere commitment, short term, limited expertise, failure, erosion of confidence, inauthentic, irresponsible, distrust,

Table A1. Green Brand Reputation Drivers, Descriptions, and Dictionaries

APPENDIX B

Green Brand Reputation Scores and Rankings Compared with the Clean200 Rankings

Brand	Green brand reputation score	Green reputation rank	Clean200 rank	Sustainable revenue (USD, 2021)
ibm	1.847386	1	85	7,094,000,000
intel	1.821949	2	13	28,132,000,000
vmware	1.437556	3	61	9,638,250,000
sap	0.597861	4	58	10,047,601,744
cisco	0.374350	5	12	29,026,233,829
pfizer	0.185247	6	34	14,049,580,000
hpe	0.169494	7	35	13,900,000,000
signifycompany	0.131015	8	98	6,082,267,442
ericsson	0.126004	9	66	9,015,658,797
verizon	0.119164	10	4	80,721,606,616
schneiderelec	0.106324	11	11	29,829,941,860
workday	0.105110	12	181	2,569,260,000
telus	0.092215	13	68	8,644,507,074
autodesk	0.087437	14	137	4,088,900,000
keringgroup	0.084930	15	57	10,093,984,842
firstsolar	0.060356	16	163	2,923,377,000
henkel	0.059151	17	99	5,784,883,721
csx	0.050655	18	107	5,366,000,000
panasonicna	0.038204	19	77	7,780,580,153
alstom	0.035417	20	48	11,627,906,977
sanofi	0.033245	21	49	11,442,481,007
nokia	0.028819	22	82	7,441,860,465
carrier	0.028270	23	50	11,390,000,000
lenovosupport	0.024537	24	78	7,717,393,428
nucorcorp	0.023774	25	14	27,888,797,035
twsemicon	0.023643	26	7	46,121,940,929
xerox	0.021628	27	108	5,304,000,000
siemensgamesa	-0.000285	28	30	14,822,409,884
abbgroupnews	-0.001875	29	28	15,567,030,000
viatrisinc	-0.003780	30	198	2,214,730,000
orsted	-0.003787	31	80	7,689,288,390
vestas	-0.006255	32	20	22,655,523,256
equinix	-0.008575	33	155	3,151,880,075
nioglobal	-0.011289	34	71	8,344,851,186
mccormickcorp	-0.013306	35	156	3,118,873,971
acuitybrands	-0.020177	36	157	3,094,850,000
nscorp	-0.021587	37	112	4,916,000,000

Brand	Green brand reputation score	Green reputation rank	Clean200 rank	Sustainable revenue (USD, 2021)
swisscom	-0.024547	38	79	7,708,869,485
adidasus	-0.038233	39	22	21,555,779,070
rogers	-0.056219	40	109	5,292,588,969
siemens	-0.084800	41	15	27,761,627,907
SoftBank_Group	-0.112966	42	17	23,106,127,226
ecolab	-0.197369	43	67	9,011,929,461
unilever	-0.301814	44	18	22,931,816,860
bt_uk	-0.321566	45	27	17,292,790,826
asus	-0.460112	46	93	6,300,655,968
gileadsciences	-0.461117	47	45	12,030,480,000
hp	-0.602485	48	9	38,844,710,000
tesla	-0.688920	49	5	53,823,000,000
apple	-0.840070	50	1	259,025,000,000
capitalone	-0.892367	51	70	8,493,614,613
unionpacific	-1.237130	52	59	10,012,000,000
applied4tech	-1.293217	53	73	8,143,000,000

Table B1. Green Brand Reputation Scores and Rankings Compared with the Clean200 Rankings

Note: Scores are the tracker's green brand reputation measure averaged over 2021. Clean200 rank and sustainable revenue are from the Clean200 report by Corporate Knights and As You Sow.

APPENDIX C

Total and Green Post Volume by Brand

Brand	Total posts	Green posts	Green posts (%)
tesla	992,502	95,726	9.64
Verizon	367,295	47,456	12.92
Apple	733,611	45,958	6.26
pfizer	338,832	44,156	13.03
HP	70,064	11,481	16.38
Cisco	62,175	8,762	14.09
IBM	81,218	8,494	10.45
bt	87,213	8,209	9.41
Intel	99,252	7,422	7.48
Siemens	21,593	5,873	27.19
SAP	35,841	5,860	16.34
Unilever	31,566	5,846	18.51
CapitalOne	106,120	5,156	4.86
HPE	33,077	4,630	13.99
VMWare	41,224	4,365	10.58
SchneiderElec	7,824	3,186	40.72
TELUS	25,674	2,698	10.50
ASUS	31,624	2,418	7.65
ericsson	17,452	2,411	13.81
Rogers	39,098	2,365	6.05
Orsted	4,000	1,906	47.65
nokia	24,028	1,866	7.77
autodesk	11,731	1,512	12.88
SiemensGamesa	2,874	1,285	44.71
NIOGlobal	30,802	1,243	4.04
Workday	8,523	1,123	13.17
sanofi	9,013	1,074	11.91
LenovoSupport	5,568	1,055	18.94
Vestas	2,823	1,012	35.84
adidasUS	20,725	999	4.82
GileadSciences	7,224	842	11.65
ABBgroupnews	2,882	732	25.39
Ecolab	3,341	666	19.93
Xerox	3,870	615	15.89
UnionPacific	4,748	600	12.63
Henkel	2,547	595	23.36
FirstSolar	1,739	567	32.60
CSX	3,244	558	17.20
KeringGroup	2,919	504	17.26

Brand	Total posts	Green posts	Green posts (%)
Alstom	3,457	502	14.52
PanasonicNA	2,318	468	20.18
Equinix	3,279	446	13.60
carrier	1,969	432	21.94
SignifyCompany	1,537	431	28.04
nscorp	1,879	350	18.62
McCormickCorp	2,380	280	11.76
SoftBank	4,848	280	5.78
Applied4Tech	967	217	22.44
Nucorcorp	732	191	26.09
AcuityBrands	904	139	15.37
ViatisInc	1,006	136	13.51
Swisscom	1,639	110	6.71
TWSemicon	956	103	10.77
AIS	3,032	84	2.77
LGChemESS	178	37	20.78
Bristol	204	17	8.33

Table C1. Total and Green Post Volume by Brand

Note: Post counts cover January to December 2021. Green posts match the initial green keyword filter. AIS, LGChemESS, and Bristol fell below the 100 green post threshold for scoring and are not included in Appendix B.

APPENDIX D

Additional Pairwise Comparisons of Green Brand Reputation

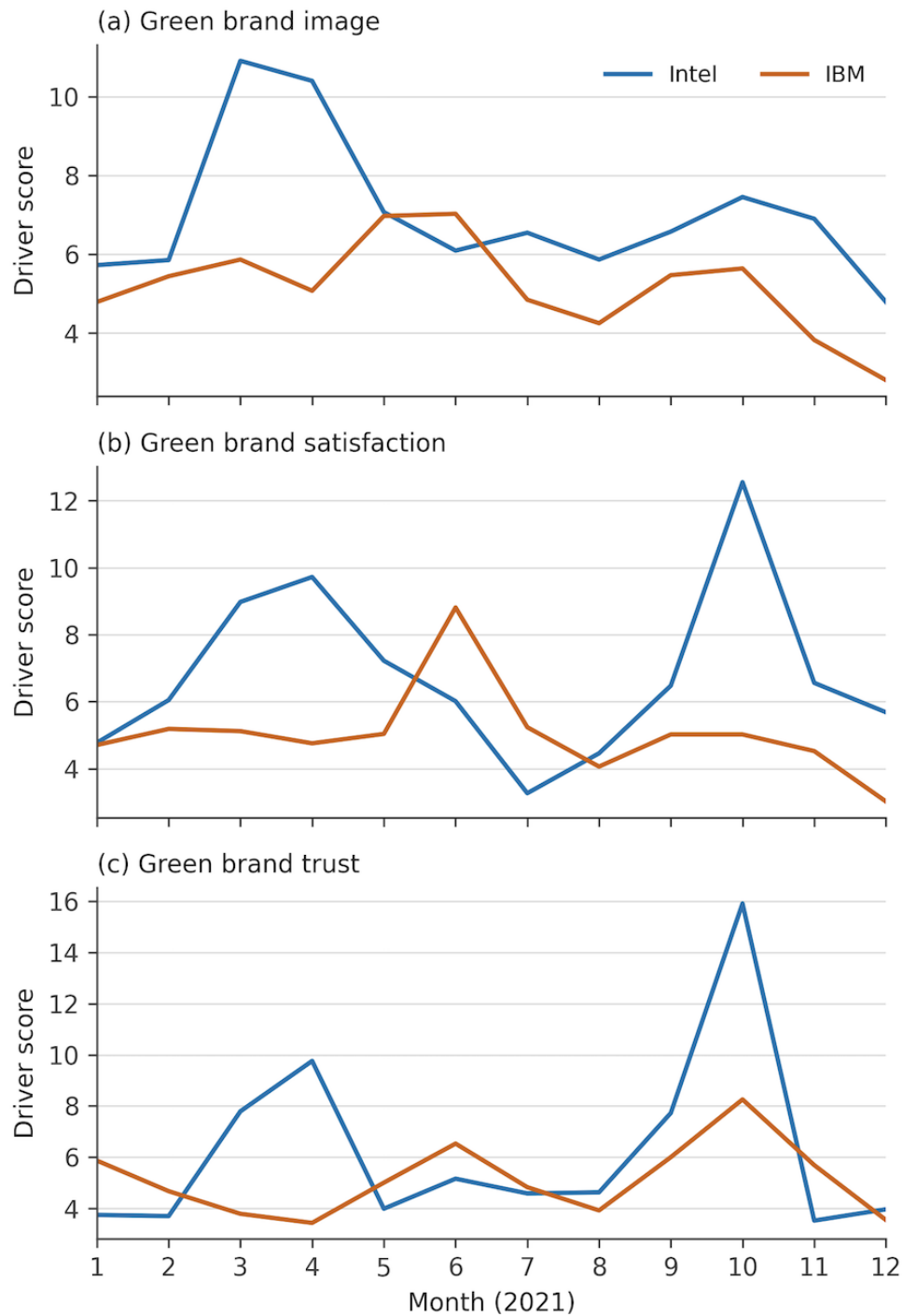


Figure D1. Pairwise Comparison of Intel and IBM by Green Driver