

Appendix 3: Sustainability Lexicons

In this Appendix, I present how Baier, Berninger and Kiesel develop their ESG word list (2019). I include their full ESG word list in Table 7. Also, my own material sustainability lexicons are presented in Table 8.

In their 2019 paper, “Environmental, Social and Governance Reporting in Annual Reports: A Textual Analysis”, Baier, Berninger and Kiesel develop an ESG word list. They argue that there does not exist a predefined ESG list and aim to fill that gap in the literature (Baier, Berninger & Kiesel, 2019). To construct their ESG word list, they begin with an existing word list called “Lexis Nexis”, which contains 6,070 terms consisting of 3,186 unique words (Baier, Berninger & Kiesel, 2019). From the Lexis Nexis word list, they assign all relevant terms to their ESG word list. Instead of stemming the words, they keep all variations of each word (Baier, Berninger & Kiesel, 2019). They reduce word chains, often called n-grams, to single-word terms (Baier, Berninger & Kiesel, 2019). A weakness of only analyzing single words, often called unigrams, is that the context is lost (Loughran & McDonald, 2016). However, they argue that their method of reducing word chains to unigrams, which includes a thorough context check, is sufficient to ensure the validity and disambiguation of their ESG word list (Baier, Berninger & Kiesel, 2019).

On their list of ESG words extracted from the Lexis Nexis, they remove all terms that either do not appear in any of the From 10-Ks in their sample, or that appear in less than 5 % of the sample reports (Baier, Berninger & Kiesel, 2019). To further validate their ESG word list, they only keep the words that are used in an ESG context in the majority of their appearances (Baier, Berninger & Kiesel, 2019). Their final ESG word list, which is provided in Table 7, consists of 482 words. The words are categorized into three levels: Topic-, category- and subcategory level.

Table 7. ESG Word List. From “Environmental, Social and Governance Reporting in Annual Reports: A Textual Analysis”, by Baier, P., Berninger, M. & Kiesel, F., 2019, *Financial Markets, Institutions & Instruments*, Forthcoming, 28(3), 263-290.

Topic	Category	Subcategory
Governance: align, aligned, aligning, alignment, aligns, bylaw, bylaws, charter, charters, culture, death, duly, parents, independent	Corporate Governance: compliance, conduct, conformity, governance, misconduct, parachute, parachutes, perquisites, plane, planes, poison, retirement	Audit and control: approval, approvals, approve, approved, approves, approving, assess, assessed, assesses, assessing, assessment, assessments, audit, audited, auditing, auditor, auditors, audits, control, controls, coso, detect, detected, detecting, detection, evaluate, evaluated, evaluates, evaluating, evaluation, evaluations, examination, examinations, examine, examined, examines, examining, irs, oversee, overseeing, oversees, oversight, review, reviewed, reviewing, reviews, rotation, test, tested, testing, tests, treadmill Board Structure: backgrounds, independence, leadership, nomination, nominations, nominee, nominees, perspectives, qualifications, refreshment, skill, skills, succession, tenure, vacancies, vacancy Remuneration: appreciation, award, awarded, awarding, awards, bonus, bonuses, cd, compensate, compensated, compensates, compensating, compensation, eip, iso, isos, payout, payouts, pension, prsu, prsus, recoupment, remuneration, reward, rewarding, rewards, rsu, rsus, salaries, salary, severance, vest, vested, vesting, vests Shareholder rights: ballot, ballots, cast, consent, elect, elected, electing, election, elections, elects, nominate, nominated, plurality, proponent, proponents, proposal, proposals, proxies, quorum, vote, voted, votes, voting Transparency: brother, clicking, conflict, conflicts, family, grandchildren, grandparent, grandparents, inform, insider, insiders, inspector, inspectors, interlocks, nephews, nieces, posting, relatives, siblings, sister, son, spousal, spouse, spouses, stepchildren, stepparents, transparency, transparent, visit, visiting, visits, webpage, website Talent: attract, attracting, attracts, incentive, incentives, interview, interviews, motivate, motivated, motivates, motivating, motivation, recruit, recruiting, recruitment, retain, retainer, retainers, retaining, retention, talent, talented, talents
	Business Ethics: cobc, ethic, ethical, ethically, ethics, honesty	Bribery and corruption: bribery, corrupt, corruption, crimes, embezzlement Political influence: grassroots, influence, influences, influencing, lobbied, lobbies, lobby, lobbying, lobbyist, lobbyists Responsible marketing: - Whistle-blowing system: whistleblower
	Sustainability Management and Reporting: announce, announced, announcement, announcements, announces, announcing, communicate, communicated, communicates, communicating, erm, fairly, integrity, liaison, presentation, presentations, sustainable	Disclosure and reporting: asc, disclose, disclosed, discloses, disclosing, disclosure, disclosures, fasb, gaap, objectivity, press, sarbanes Governance of sustainability issues: - Stakeholder engagement: engagement, engagements, feedback, hotline, investor, invite, invited, mail, mailed, mailing, mailings, notice, relations, stakeholder, stakeholders UNGC compliance: compact, ungc
Environmental: clean, environmental, epa, sustainability	Climate Change: Climate, warming	Biofuels: biofuels, biofuel Climate change strategy: green, renewable, solar, stewardship, wind Emissions management and reporting: emission, emissions, ghg, ghgs, greenhouse, atmosphere, emit
	Ecosystem Service: agriculture, deforestation, pesticide, pesticides, wetlands	Access to land: zoning Biodiversity management: biodiversity, species, wilderness, wildlife Water: freshwater, groundwater, water
	Environmental Management: cleaner, cleanup, coal, contamination, fossil, resource	Environmental standards: - Pollution control: air, carbon, nitrogen, pollution, superfund Product opportunities: - Supply chain environmental standards: - Waste and recycling: biphenyls, hazardous, householding, pollutants, printing, recycling, toxic, waste, wastes, weee, recycle
Social: citizen, citizens, csr, disabilities, disability, disabled, human, nations, social, un, veteran, veterans, vulnerable	Public Health: children, epidemic, health, healthy, ill, illness, pandemic	Access to medicine: childbirth, drug, medicaid, medicare, medicine, medicines HIV and AIDS: hiv Nutrition: alcohol, drinking Product safety: bugs, conformance, defects, fda, inspection, inspections, minerals, standardization, warranty
	Human Rights: dignity, discriminate, discriminated, discriminating, discrimination, equality, freedom, humanity, nondiscrimination, sexual	Community relations: communities, community Privacy and free expression: expression, marriage, privacy Security: peace Weak governance zones: -
	Labor Standards: bargaining, eeo, fairness, fla, harassment, injury, labor, overtime, ruggie, sick, wage, wages, workplace	Diversity: bisexual, diversity, ethnic, ethnically, ethnicities, ethnicity, female, females, gay, gays, gender, genders, homosexual, immigration, lesbian, lesbians, lgbt, minorities, minority, ms, race, racial, religion, religious, sex, transgender, woman, women Health and safety: occupational, safe, safety, safety ILO core conventions: ilo, labour Supply chain labor standards: eicc
Society: endowment, endowments, people, philanthropic, philanthropy, socially, societal, society, welfare	Charity: charitable, charities, charity, donate, donated, donates, donating, donation, donations, donors, foundation, foundations, gift, gifts, non-profit, poverty Education: courses, educate, educated, educates, educating, education, educational, learning, mentoring, scholarships, teach, teacher, teachers, teaching, training Employment: employ, employment, headcount, hire, hired, hires, hiring, staffing, unemployment	

Table 8. Sustainability Lexicons

Dimension	General Issue Category	Terms
Environment	GHG Emissions	emission, emissions, ghg, ghgs, greenhouse, atmosphere, emit, carbon, nitrogen, methane, hydrofluorocarbon, hydrofluorocarbons, perfluorocarbon, perfluorocarbons, sulfur, co2, ch4, n2o, hfc, pfc, sf6, nf3, warming, coal, fossil
	Air Quality	nitrogen, nox, sulfur, sox, voc, Chlorofluorocarbon, chlorofluorocarbons, pollution, superfund, air, pollution, oxides, airborne, pollutant, pollutants, pollute
	Energy Management	biofuel, biofuels, gree, renewable, solar, stewardship, wind, grid
	Water & Wastewater Management	water, freshwater, groundwater, wastewater, aquifer
	Waste & Hazardous Materials Management	biphenyls, hazardous, householding, pollutants, printing, recycling, toxic, waste, wastes, weee, recycle, non-hazardous, contamination
	Ecological Impacts	zoning, biodiversity, species, wilderness, wildlife, agriculture, deforestation, pesticide, pesticides, wetlands, ecosystem, ecosystems, habitat
Social Capital	Human Rights & Community Relations	dignity, discriminate, discriminated, discriminating, discrimination, equality, freedom, humanity, nondiscrimination, sexual, communities, community, socio-economic, justice
	Customer Privacy	expression, marriage, privacy, peace, opt-in
	Data Security	pii, cyber, cybersecurity, collection, retention, sensitive, confidential, data, it, peace
	Access & Affordability	childbirth, drug, medicaid, medicare, medicine,

		medicines, access, affordability, afford
	Product Quality & Safety	bugs, conformance, defects, fda, inspection, inspections, minerals, standardization, warranty, withdrawal
	Customer Welfare	alcohol, drinking, occupational, safe, safely, safety, health, nutrition, healthy, children, epidemic, ill, illness, pandemic, hiv, antibiotic, welfare
	Selling Practices & Product Labeling	transparency, transparent, marketing, accuracy, advertising, labelling, selling, sell, sells, label, labels, labelled, advertise, advertises, advertisement
Human Capital	Labor Practices	bargaining, eeo, fariness, fla, labor, overtime, ruggie, wage, wages, workplace, labour, ilo, remuneration, appreciation, award, awarded, awards, awarding, bonus, bonuses, cd, compensate, compensated, compensates, compensating, compensation, eip, iso, isos, payout, payouts, pension, prsu, prsus, recoupment, reward, rewarding, rewards, rsu, rsus, salaries, salary, severance, vest, vested, vesting, vests
	Employee Health & Safety	occupational, safe, safely, safety, injury, sick
	Employee Engagement, Diversity & Inclusion	bisexual, diversity, ethnic, ethnically, ethnicities, ethnicity, female, females, gay, gays, gender, genders, homosexual, homosexuals, immigration, lesbian, lesbians, lgbt, minorities, minority, ms, race, racial, religion, religious, sex, transgender, woman, women, discrimination, discriminatory, harassment, talent, attract, attracting, attracts, incentive, incentives, interview, interviews, motivate, motivated, motivates, motivating, motivation, recruit, recruiting, recruitment, retain,

		retainer, retainers, retaining, retention, talent, talented, talents, employ, employment, headcount, hire, hired, hires, hiring, staffing, unemployment
Business Model & Innovation	Product Design & Lifecycle Management	lifecycle, packaging, package, distribute, distribution, distributing, use-phase
	Business Model Resilience	long-term, planning, growth
	Supply Chain Management	esg, externalities, ethics, corruption
	Materials Sourcing & Efficiency	sourcing, efficiency, end-of-life, dematerialization, r&d, material, materials, renewable, recycle, recycled, recycling
	Physical Impacts of Climate Change	climate, environmental, socio-economic, weather
Leadership & Governance	Business Ethics	ethic, ethical, ethically, ethics, honesty, bribery, corrupt, corruption, crimes, embezzlement, grassroots, influence, influences, influencing, lobbied, lobby, lobbies, lobbying, lobbyist, lobbyists, whistleblower, fraud, fiduciary
	Competitive Behavior	monopoly, monopolies, collusion, monopolistic, anti-competitive, manipulation, ip, patent, patented, patents
	Management of the Legal & Regulatory Environment	approval, approvals, approve, approved, approves, approving, assess, assessed, assesses, assessing, assessment, assessments, audit, audited, auditing, auditor, auditors, audits, control, controls, coso, detect, detected, detecting, detection, evaluate, evaluated, evaluates, evaluating, evaluation, evaluations, examination, examinations, examine, examined, examines, examining, irs, oversee, overseeing, oversees, oversights, review, reviewed,

		reviewing, reviews, rotation, test, tested, testing, tests, treadway, policy, regulate, regulatory, monetary, policy, legal, illegal, compliance
	Critical Incident Risk Management	accident, accidents, emergency, emergencies, safe, safety, safely
	Systemic Risk Managements	systemic, large-scale, collapse, weakening, system, systems, safeguards, safeguard, failure, failures