Supplementary Information for

Emotion and Engagement in Reddit Climate Talk

S1 Reddit data and terms

Data Fields Used in Analysis

Post-related fields	
`selftext`:	Text body of a self (text) post
`created_utc`:	Unix timestamp of post creation
`num_comments`:	Number of comments on the post
`score`:	Net upvotes (upvotes minus downvotes)
`id`:	Unique ID of the post
`subreddit_subscribers`:	Number of subscribers to the subreddit (at time of post)
Comment-related fields	
`body`:	Text content of a comment
`created_utc`:	Unix timestamp of comment creation
`score`:	Net upvotes on the comment
`parent_id`:	ID of the parent (post or comment)
`link_id`:	ID of the root post to which the comment belongs

S2 Topics statistics from BerTopic

Name	Count	Representation
trees_tree_planting_forests	5642	trees, tree, planting, forests, wood, forest, planted, plant, deforestation, reforestation
nuclear_reactors_reactor_uranium	4850	nuclear, reactors, reactor, uranium, waste, chernobyl, fukushima, thorium, radioactive, power
methane_hydrates_leaks_release	2861	methane, hydrates, leaks, release, ch4, clathrate, hydrate, leak, potent, clathrates
sea_rise_level_tide	2154	sea, rise, level, tide, acceleration, mm, gauge, sealevel, gauges, meters
evs_ev_electric_cars	2078	evs, ev, electric, cars, car, vehicles, charging, vehicle, hybrid, charge
science_scientific_consensus_scientist	1842	science, scientific, consensus, scientist, scientists, settled, antiscience, politics, opinion, listen
she_her_shes_girl	1731	she, her, shes, girl, herself, listen, shell, woman, school, young
plastic_plastics_recycling_bags	1522	plastic, plastics, recycling, bags, bottles, recycle, glass, recycled, trash, singleuse
fuels_fossil_fuel_burning	1467	fuels, fossil, fuel, burning, industry, ground, fossilfuel, burn, transition, fossils
oil_peak_companies_reserves	1344	oil, peak, companies, reserves, big, prices, execs, profits, opec, petroleum
vegan_veganism_vegans_diet	1296	vegan, veganism, vegans, diet, vegetarian, meat, animal, eat, diets, eating
ipcc_reports_report_summary	1269	ipcc, reports, report, summary, conservative, policymakers, ipccs, summaries, makers, ar6
panels_solar_pv_rooftop	1176	panels, solar, pv, rooftop, roof, wind, panel, storage, grid, installation
arctic_ice_extent_icefree	1151	arctic, ice, extent, icefree, sea, lowest, summer, volume, september, free
russia_ukraine_putin_russian	1114	russia, ukraine, putin, russian, russias, putins, war, sanctions, invasion, russians
australia_australian_australias_australians	1103	australia, australian, australias, australians, abbott, aussie, morrison, turnbull, prime, minister
exxon_exxons_mobil_exxonmobil	1081	exxon, exxons, mobil, exxonmobil, knew, exxonmobils, 1982, investigation, probe, hoffert
greta_thunberg_her_gretas	1001	greta, thunberg, her, gretas, thunbergs, activist, she, speech, blah, teen
extinction_extinct_species_extinctions	979	extinction, extinct, species, extinctions, sixth, mass, 6th, event, nearterm, humans
models_model_accurate_predictions	963	models, model, accurate, predictions, predict, modelling, modeling, predicted, prediction, nnn

Name	Count	Representation
geoengineering_geo_srm_engineering	958	geoengineering, geo, srm, engineering, geoengineer, risks, unintended, aerosol, geoengineered, sulfur
crop_wheat_yields_crops	955	crop, wheat, yields, crops, farmers, yield, maize, corn, agricultural, rice
sun_maunder_minimum_irradiance	954	sun, maunder, minimum, irradiance, solar, tsi, activity, sunspot, sunspots, grand
manchin_manchins_joe_sinema	950	manchin, manchins, joe, sinema, senator, democrats, virginia, senate, senators, bill
drought_droughts_california_californias	950	drought, droughts, california, californias, swna, megadrought, precipitation, severe, 20002018, 19year
wind_turbines_offshore_turbine	936	wind, turbines, offshore, turbine, windmills, blades, farms, farm, birds, onshore
coral_reef_reefs_bleaching	911	coral, reef, reefs, bleaching, barrier, corals, bleached, gbr, great, marine
hurricanes_hurricane_cyclones_tropical	911	hurricanes, hurricane, cyclones, tropical, cyclone, atlantic, category, intensity, storms, frequency
warmest_hottest_record_month	897	warmest, hottest, record, month, july, consecutive, 2014, 2015, september, june
software_engineering_career_engineer	827	software, engineering, career, engineer, jobs, job, engineers, skills, masters, degree
trump_trumps_donald_administration	806	trump, trumps, donald, administration, president, humancaused, presidency, adviser, white, administrations
fight_combat_fix_solutions	802	fight, combat, fix, solutions, solution, fixing, change, ways, priority, solve
planet_save_saving_earth	788	planet, save, saving, earth, fine, heal, destroying, dying, planets, mother
germany_france_german_nuclear	775	germany, france, german, nuclear, germanys, twh, reactors, coal, plants, phaseout
deleted_user_by_	761	deleted, user, by
him_he_hes_his	736	him, he, hes, his, scientist, thinks, shellenberger, believes, guy, conspiracy
heatwave_deaths_wave_waves	731	heatwave, deaths, wave, waves, heatwaves, heat, heatrelated, deadly, cold, europes
meat_eating_eat_beef	730	meat, eating, eat, beef, meats, steak, chicken, cultured, diet, plantbased
years_ten_centuries_decade	728	years, ten, centuries, decade, ago, late, twenty, timeline, 20, 30
hydrogen_electrolysis_h2_ammonia	715	hydrogen, electrolysis, h2, ammonia, green, cell, storage, fortescue, electrolyser, produced

S3 Topic volumes as a function of time

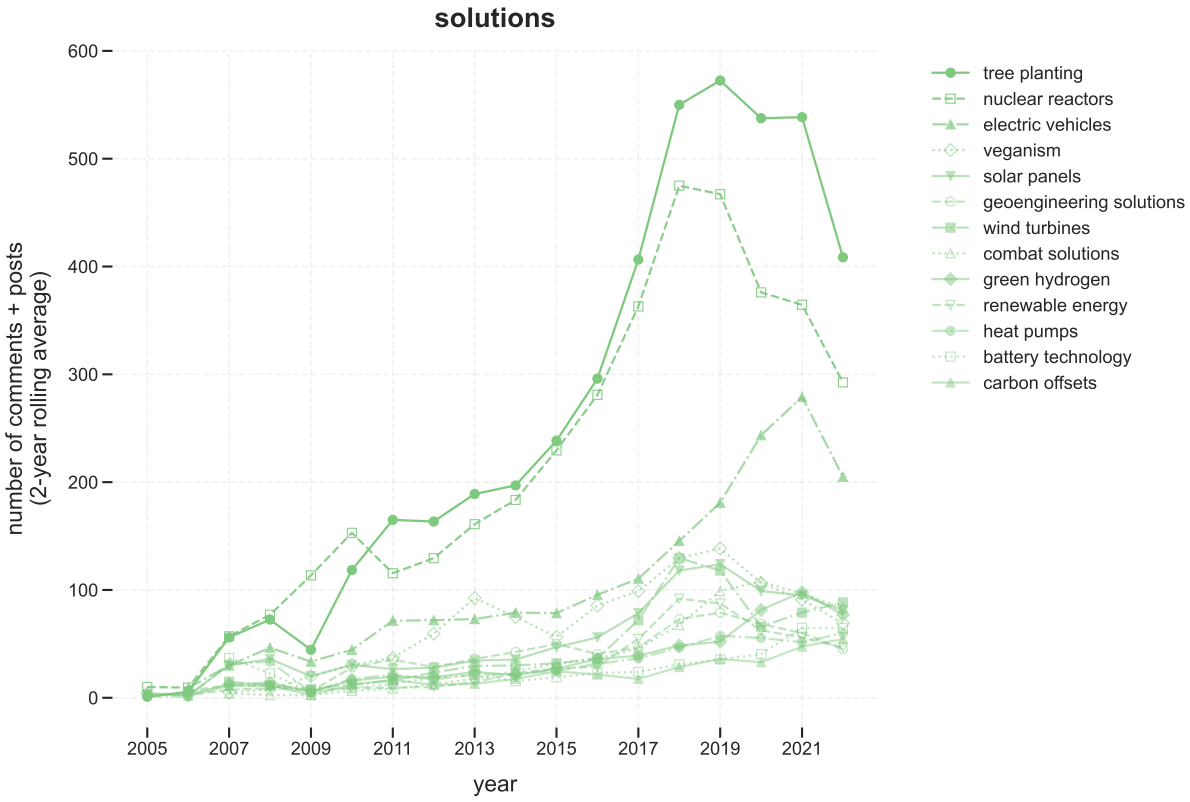

Figure S1. Temporal patterns of volume across topics in theme: Solutions on climate Reddit.

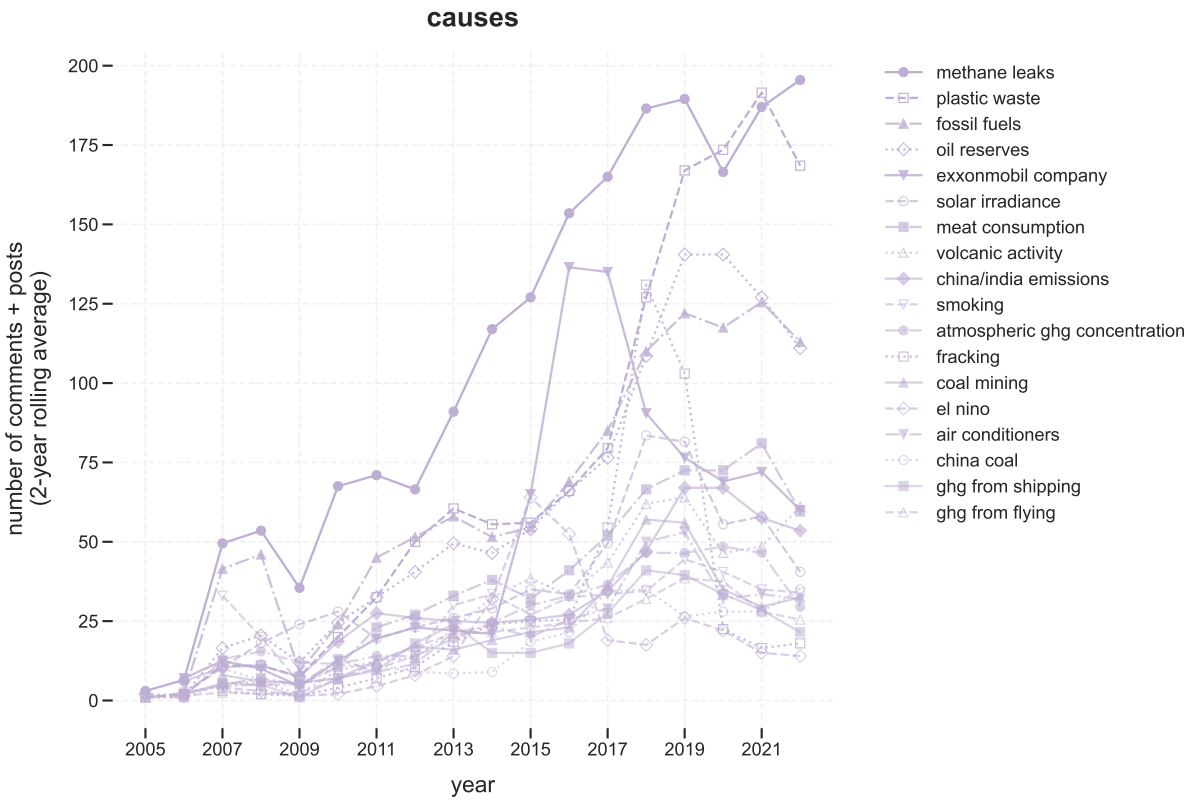

Figure S2. Temporal patterns of volume across topics in theme: Causes on climate Reddit.

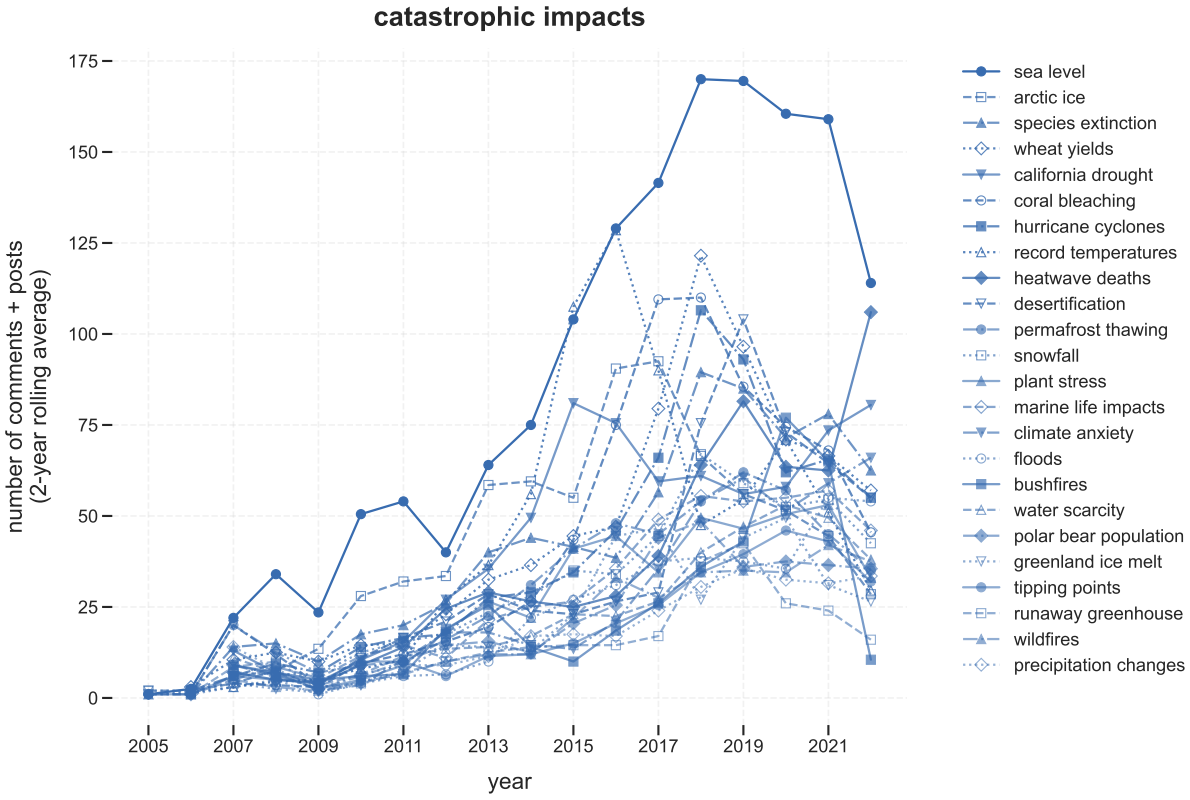

Figure S3. Temporal patterns of volume across topics in theme: Catastrophic impacts on climate Reddit.

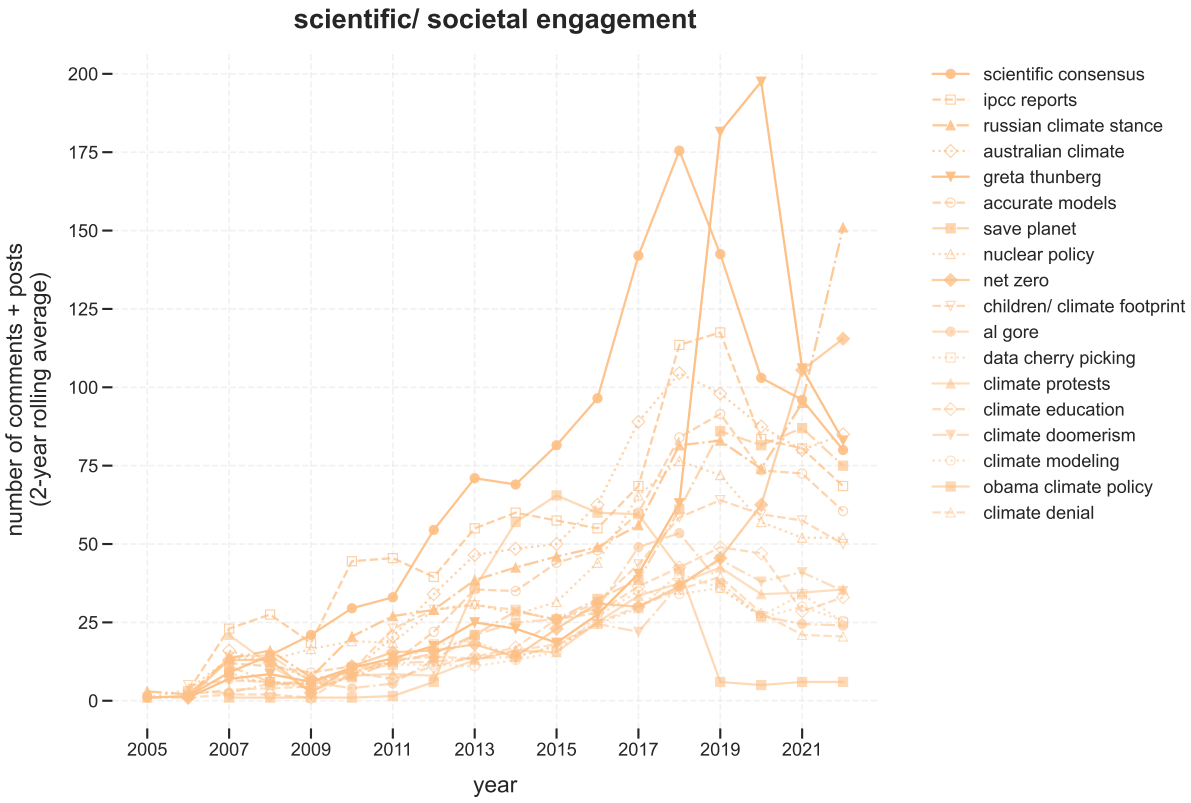

Figure S4. Temporal patterns of volume across topics in theme: Scientific and societal engagement on climate Reddit.

S4 Total volume does not entirely predict the core-ness of a topic.

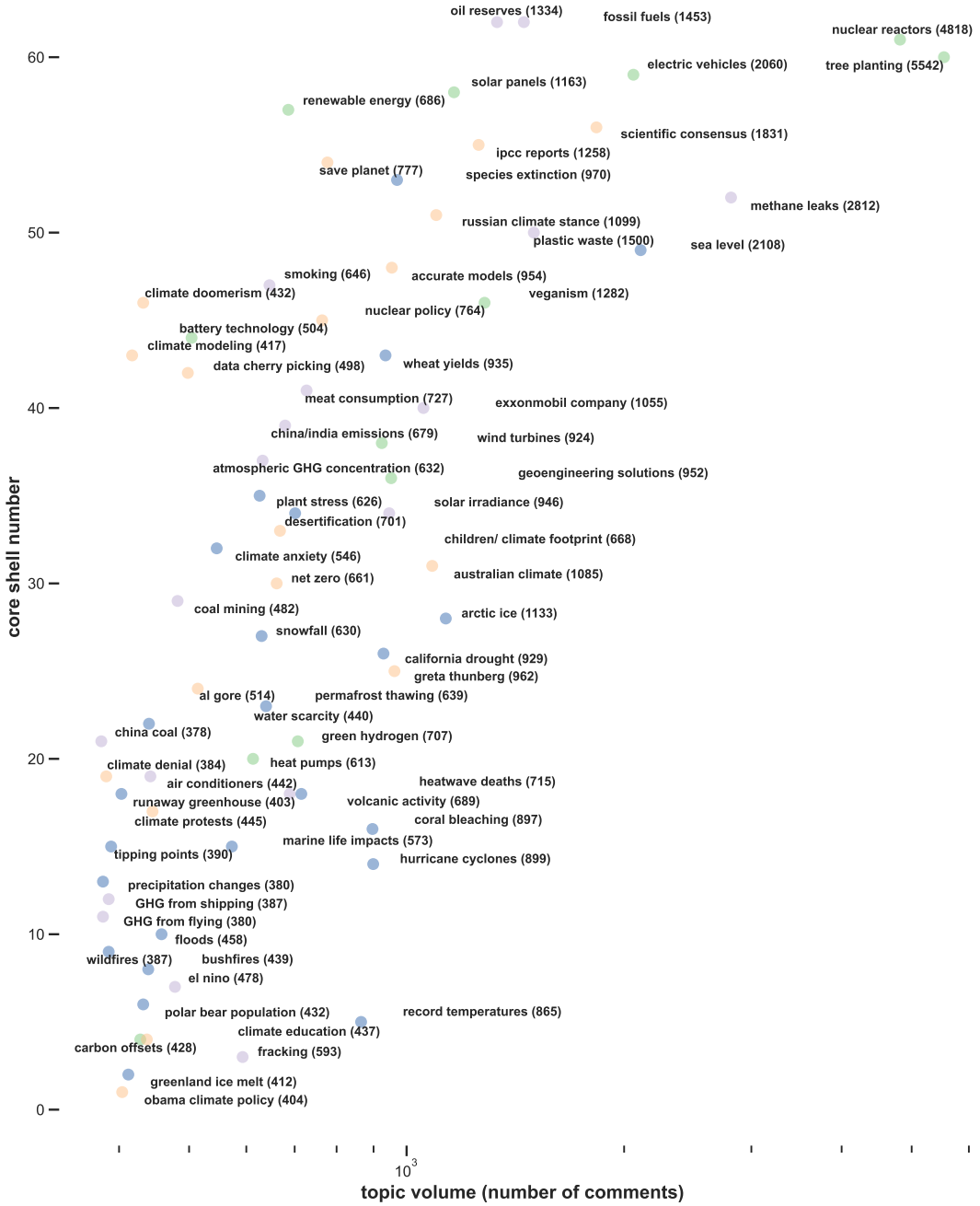

Figure S5. Core shell number vs total volume of the topic. Topic with similar total volume on Reddit can vary widely in their core shell number, indicating that while there is a correlation, core shell number captures structural features of the topic co-occurrence network and not simply the volume.

S5 Quotes from Reddit Users

Disapproval of EVs

Systemic Critique:

"If all we do is replace ICE cars with electric cars, we're still screwed. Car-centric development inherently makes alternative modes difficult."
"Electric cars won't save us. Making public transport free and fully electric will."
"We need to radically reshape the country away from its current automobile, infrastructural paradigm."

Environmental and Ethical Concerns:

"EVs aren't going to save the environment—have you seen the impact of battery production?" "The destruction caused by lithium and nickel mining to make EVs is a disaster waiting to happen."
"Sticking with the 'everyone needs a car' model will doom us, and the way it is will only be a solution for the affluent."

Practical and Infrastructure Limitations:

"The main thing that prevents me from getting an electric car is long-distance travel in winter. I don't want to turn off my heat just to make it to my destination."
"There's not enough charging infrastructure in rural areas to make EVs practical for everyone."
"When I have to drive from Missouri to Kentucky, I'd need to stop twice for charging, delaying me by 1–2 hours."

Affordability and Economic Barriers:

"I'd love to switch to an EV, but I can't afford one right now."
"The gap between gas cars and EVs is too big—most people can't bridge that cost difference."
"Here in Canada, the Ford Lightning is 85k vs 50k for a standard F-150. Many people can't afford to bridge that gap."

Energy Grid Concerns:

"Growth demand for electricity from EVs is going to outpace installation growth of renewable energy under this projection."
"If we push for full electrification without fixing the grid first, we will still be running EVs on coal and natural gas."

Overconsumption and Greenwashing:

"Electric vehicles will not significantly help anything related to the climate. It's just another thing to consume masked as activism."
"We simply don't have the mineral resources to continue growing car ownership at the rate it's been going."
"EVs are not here to save the world. They're here to save the car industry."

Approval of EVs

Environmental and Efficiency Benefits:

"EVs can convert more than 75% of energy from the wall into kinetic energy. Gasoline motors manage about 12–25%."
"Electric cars are so efficient that even on a COAL power grid, they break even on emissions within a couple of years."
"We are bringing on green sources all the time. Electric cars take advantage of that."

Technological Momentum:

"Battery tech needs to get a little bit better, but it's basically there now."
"India and China are pumping out the solar panels, but the world is behind on batteries, one of the biggest bottlenecks."

Policy and Economic Drivers:

"A relatively small nudge from the EPA can make EVs the cheaper and therefore default option."
"They are cheaper to run and do not pollute much at the point of use."

Approval of Tree Planting

Environmental Impact and Climate Mitigation:

"Yes indeed! Planting trees is the most economical way of fighting climate change!" "We're going to solve climate change by sequestering more carbon through trees and forests."
"Adding nearly 1 billion hectares of forest could remove two-thirds of the roughly 300 gigatons of carbon humans have added to the atmosphere since the 1800s."
"Planting trees and massive rewilding is going to be absolutely necessary in addition to rapid decarbonization."

Economic, Social, and Practical Benefits:

"Plant trees, create shelter, shade, and assist in precipitation (rain). It doesn't matter what the tree is—just plant trees!" "Lots of details to be worked out. But planting an oak sequesters X kg of carbon, a conifer sequesters Y kg. We need to map the most beneficial species for each location."

Sustainable Reforestation and Strategy:

"Best thing to do is to plant in a region where forest used to thrive or close to one to expand it. And only plant already existing plants there."
"Reforestation has to be done smartly though. Planting a monoculture forest won't help in the long run unless it's purely for lumber harvesting."

Call to Action:

"The best time to plant a tree was 20 years ago. The second-best time is now."
"I have planted about 75 trees so far this year. The best day to plant a tree is yesterday, so get on it today!"

Disapproval of Tree Planting

Skepticism Toward Impact:

"Planting trees alone is not enough. Switching to EVs alone is not enough. Switching the grid to renewables is not enough. However, all of them combined together might be enough."
"Trees won't solve the problem. Not even close."
"Planting trees doesn't hurt but isn't terribly helpful. A hectare of growing trees will absorb about 7 tons of carbon a year. The carbon footprint of the average Swede is about 10 tons a year."

Scientific and Structural Limitations:

"No, it's actually bad news. This means, this entire time, folks have been overestimating the CO2-reducing ability of each tree."
"The trees we already have are dying fast from climate change. 2,000-year-old Sequoias are dropping lots of needles."

Corruption and Mismanagement:

"It's worth noting that this isn't about the science—it's about corrupt third-world officials making off with money that was supposed to be spent protecting forests."
"Didn't China already plant 2 billion trees to no avail?"

Ecosystem Concerns:

"We generally need to restore ecosystems that include different kinds of trees, shrubs, and ground cover. Just blindly planting trees was never going to cut it."
"It doesn't help that many cities prefer male trees."

Critique of Offsets and Delay Tactics:

"The calculation there is erroneous at best. Those trees aren't going to be sequestering much carbon for many years, and many of them will die before they grow."
"In some cases carbon offset programs have caused increases in emissions, not reductions, simply because they give corporations a 'get out of jail free' card to burn as much as they want."

Admiration for Coral Reefs

Resilience and Discovery:

"Coral cover on the Great Barrier Reef is at the highest levels since records began."
"Scientists discovered a pristine, three-kilometer-long reef of rose-shaped corals in waters deep enough to protect it from bleaching."

Ecological Importance:

"Corals are an excellent canary, good job on pointing them out."
"The Great Barrier Reef is magnificent; I suggest you visit the reef."

Conservation and Hope:

"Chasing Coral captures panoramic footage of struggling reefs worldwide and highlights that it is not too late to save them."

Disapproval of Nuclear Energy

Economic and Practical Constraints:

"Nuclear Power isn't economically viable. In order for it to actually be safe, it's prohibitively expensive in the current energy market."
"A nuclear power plant takes 5–7 years to build, billions of dollars, and isn't safe from disasters like Chernobyl and Fukushima."
"With the same amount of money, you could make more energy from wind and solar power (and get it sooner)."
"You can't even start and finish a nuclear plant in the next critical decade for climate change."
"You can't easily scale that up 70 times; it takes time to educate people and to massively increase production of very specialized equipment."

Safety and Historical Incidents:

"Nuclear is NOT 'green.' No one wants to live in radioactive capitalist Chernobyl."
"No. Nuclear power is not clean or safe. How do we know? Answer: Three Mile Island, Hanford Nuclear Reservation, Chernobyl, Fukushima, etc."

Waste and Long-Term Risks:

"Our current method of disposing of nuclear waste is putting it into barrels that have already shown signs of degradation over the last half century."
"Nuclear waste can last for tens of thousands of years."

Distrust in Institutions and Governance:

"I do NOT support building nuclear plants while the corrupt men in politics and business still have such power."
"Big Nuke are going to lobby hard for deregulation, and become slacker and sloppier at waste disposal."

Impact on Renewables:

"The unfortunate truth is that nuclear displaces renewables, and there are (still) safety issues, as well as long-term storage of low-level radioactive waste."

Approval of Fossil Fuels

Recognition of Dependence and Legacy:

"Like it or not, most of our modern world is powered by fossil fuels."
"Fossil fuels have been utterly incredible for human civilization, and no one wants to give that up."
"Most of the economy is built around fossil fuels still."

Pragmatic Transition Views:

"They are also pretty much ingrained into society, and switching from fossil fuels is going to take more than a month."
"I don't have a problem with burning limited amounts to get us off them entirely. That's what a sensible transition would look like."
"If we stopped burning fossil fuels for energy and transportation, that would be the most important thing."

Caution Against Economic Disruption:

"If we aggressively implemented renewables and energy conservation, it's not hard to see us getting by on 10% of the fossil fuel use we have now."
"Banning fossil fuel extraction before we build the necessary renewable capacity and transmission infrastructure is also dumb."

Disapproval of Fossil Fuels

Urgency and Moral Imperative:

"We need to stop burning fossil fuels as soon as humanly possible and that's not going to happen through voting for conservatives."
"People don't want to drop the comforts of fossil fuel life."

Industry Critique and Misinformation:

"The fossil fuel industry has funded deception and denial, destroyed the reputations of climate scientists with lies, and pushed the western world into military occupation of the Middle East."
"Congress is paid by the fossil fuel industry to prevent things like this."

Systemic Barriers and Global Dependence:

"The amount of global energy that is fossil fuel-based is over 85%."
"There are many structural and policy reasons why we will continue to be mostly dependent on fossil fuels for decades."

Disapproval of Scientific Consensus

Skepticism of Institutional Integrity:

"When your funding is dependent on generating particular results, you are going to make the data fit."
"Science has been contaminated for decades by right-wing politics, and it has caused enormous problems for science."
"The scientific method is fallible because humans."

Rejection of Consensus as Authority:

"I 100% reject their consensus."
"Absolutely no. The scientific community's opinion has been overthrown time and time again in history."

Critique of Public Misuse of Science:

"The problem is either people only look at the science that proves their point and ignore the thousands of other scientific papers that disprove their point. Or just don't listen to science at all."

S6 Emotional occurance for other topics

S7 Emotions with low-occurrence in our Reddit post data

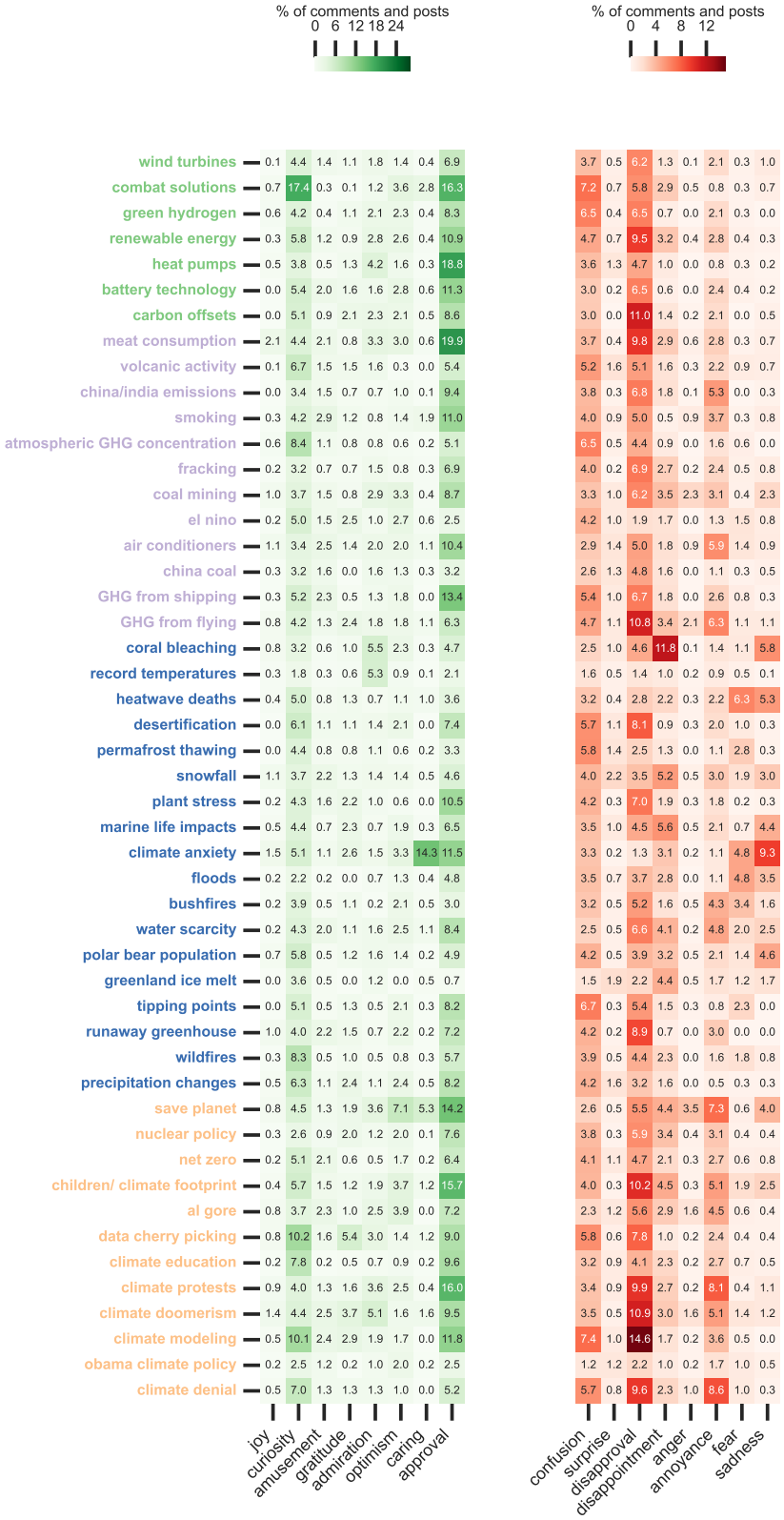

Figure S6. Emotions for topics not shown in main text. Percentage occurrence of emotions by RoBerta Go emotions. Topics are colored by themes they belong to, solutions are in blue, causes are in yellow, scientific and societal engagement are in red, and catastrophic impacts are in green.

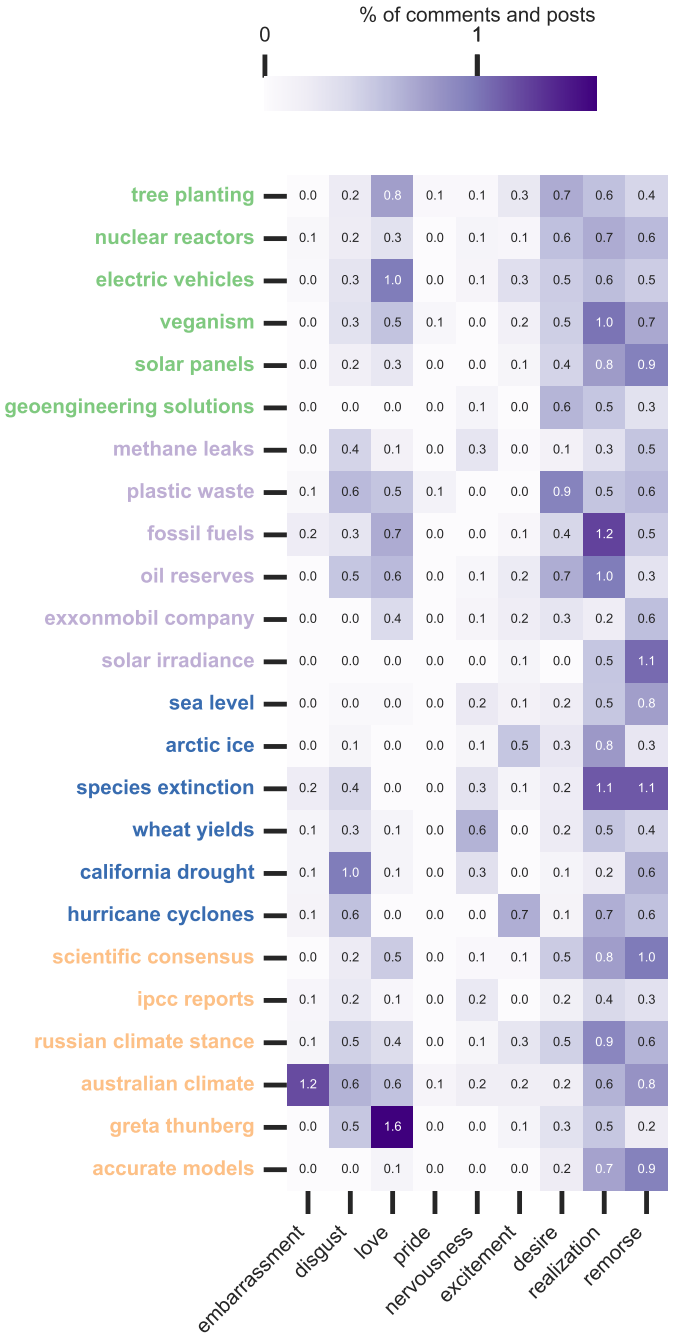

Figure S7. Emotions with low occurrence for all topics. Percentage occurrence of less frequent emotions by RoBerta Go emotions. Topics are colored by themes they belong to, solutions are in blue, causes are in yellow, scientific and societal engagement are in red, and catastrophic impacts are in green.