A handbook for sustainability science communication

Planetary Communications



Stockholm Resilience Centre | Stockholm University

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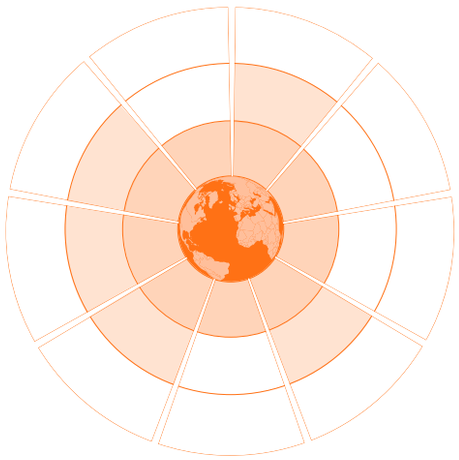
Written by Fredrik Moberg, Marcus Lundstedt, Marika Haeggman, and Vaida Razaityte from Stockholm Resilience Centre (SRC). **With support from** the whole communication team at SRC and with **contributions from workshop participants**: Astrid Auraldsson, Jonas Bane, Frida Berry Eklund, Owen Gaffney, Diego Galafassi, Daniel Goldberg, Jutta Haider, Martin Hultman, Jerker Lokrantz, Isabelle McAllister, Andrew Merrie, Frank Radosevich, Johan Rockström, Maya Rebermark, Malte Rödl, Adam Springfeldt, Kaj Török, Jakob Trollbäck, Maria Wolrath Söderberg. **Also thanks to many** others who have given feedback and/or participated in seminars where we have road-tested the model and handbook: other SRC colleagues and students, staff at the science centre Universeum, students at Berghs School of Communication, participants at a workshop co-hosted with CommToAct, and several others. **Layout and graphics:** Azote for SRC. **AI support:** Parts of this handbook were co-developed with AI as editorial support to improve the language, clarity, and readability. All edits were verified by the authors to ensure accuracy, and no unverified text remains in the final document. **Final note:** While we are grateful for all contributions and feedback, the final content and any remaining errors remain the responsibility of the authors.



FOREWORD BY JOHAN ROCKSTRÖM

How we communicate can determine the fate of our planet



In 2009, 28 researchers came together with a bold ambition: to define the boundaries within which humanity can thrive on a stable and resilient planet. The resulting Planetary Boundaries framework reveals nine critical Earth system processes, and how close we are to crossing the boundaries that keep our planet safe. More than fifteen years later, the alarm is louder than ever. Seven of nine planetary boundaries have now been breached. We are putting our biosphere – the very foundation of human life, nature, societies and economies – at risk. This grim reality calls for urgent actions, powered by solid science and people collaborating for change.

Inspired by the planetary boundaries work, a new group of researchers, communicators, and creatives has come together and contributed to a science-based communications handbook: Planetary Communications. The hope is to support and connect people worldwide who want to communicate sustainability science as effectively as possible – helping secure life within planetary boundaries.

Scientific knowledge alone does not drive transformation. The urgency of our planetary crisis is deepening, something that is painfully obvious when we look around the world. Record-breaking temperatures, raging wildfires, and catastrophic flooding are becoming the new normal. This escalating crisis demands not just cutting-edge science, but also the ability to communicate it in impactful ways. Science communication must bridge the gap between knowledge and societal action, ensuring that the insights we generate are not confined to academic circles but reach decision-makers and communities worldwide. This is where the Planetary Communications model comes in.

This handbook is more than a guide – it is a call to action. If we are to secure a liveable future, we must transform how we engage the world with sustainability science. This means crafting narratives that resonate across cultures, designing visuals that make complexity accessible, and developing communication strategies that inspire collective action. The Planetary

Photo: Jadranko Marjanovic

Communications model offers precisely this: a practical, scientifically grounded, and forward-thinking approach to communicating sustainability in ways that mobilise change at scale.

I invite you to explore this handbook not just as a resource for sustainability science communication, but as an essential tool for connecting people across the globe in shaping a safe and just future – for life within planetary boundaries. Science alone cannot save us – how we communicate and act upon it will determine the fate of our planet.

–Johan Rockström

Director, Potsdam Institute for Climate Impact Research (PIK)

Co-founder and professor at the Stockholm Resilience Centre, Stockholm University

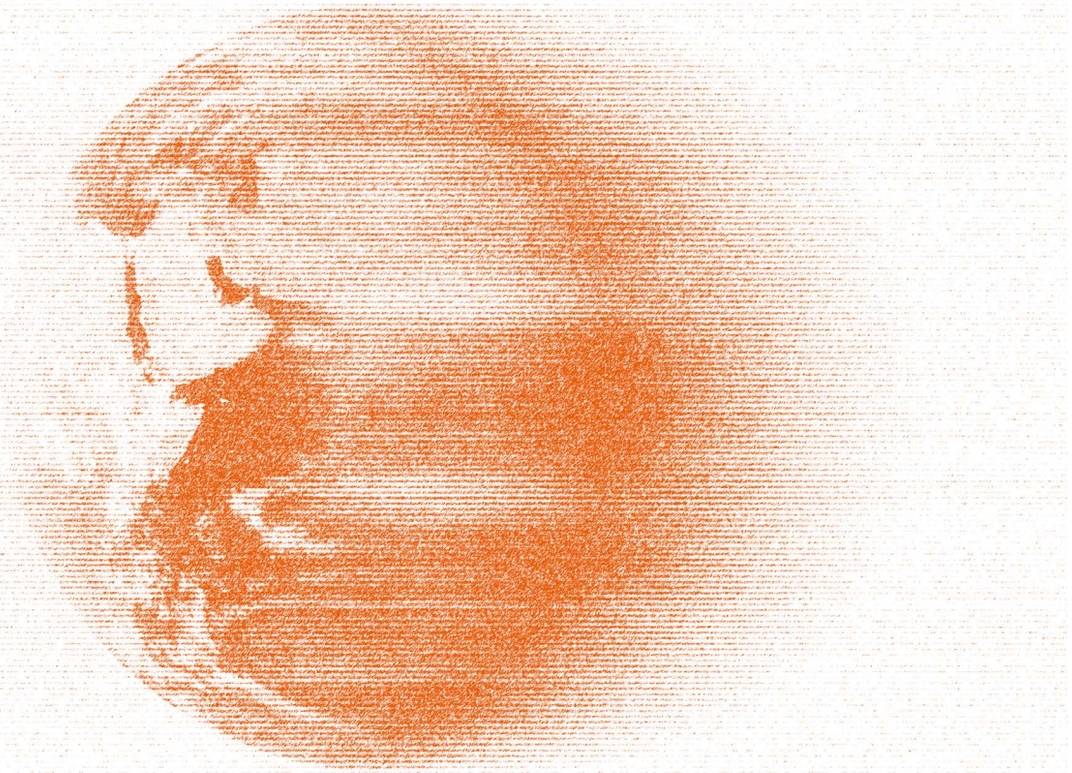


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Photo: iStock

Why we need to talk about how we talk about the planet

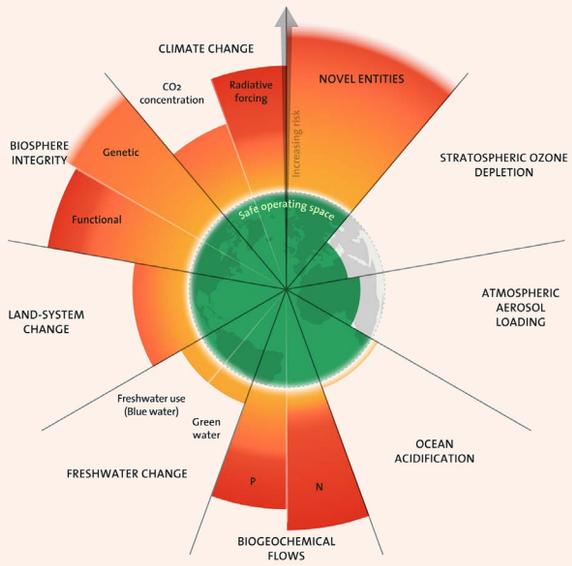
It took one day of workshopping with Johan Rockström on the island of Lidingö outside Stockholm, where the planetary boundaries framework was first developed, before we had a first draft of what we call Planetary Communications. The reactions in the room were mixed. Several participants, from advertising, arts, PR, journalism, and academia, were unconvinced: “What is actually new here?” It’s a fair question. Being evidence-based, visualising, simplifying, choosing the right moment, and considering emotions are hardly revolutionary insights. But as the model was tested with group after group in various contexts, it kept proving its worth: it gave people a shared language. And sometimes, that is exactly what is missing.

Communicating climate and sustainability science has never been simple. But in today’s media landscape, which is polarised, fragmented, and partly resistant

BOX 1

Planetary Boundaries – a communicative framework

First proposed in 2009, the Planetary Boundaries framework has been very successful in communicating the urgency of the climate and nature crises, influencing science, policy, business and parts of the general public. It identifies safe boundaries for nine Earth system processes – from climate change to biodiversity loss to freshwater flows – that define a safe operating space for humanity. As of 2026, seven of the nine boundaries have been crossed.



to facts, it has become genuinely hard. Messages compete with wars, economic anxiety, and relentless information flows. Mis- and disinformation spreads faster than corrections. And even well-crafted, evidence-based messages often fail to land, or land without leading to action.

The barriers are well-documented. Misinformation and mistrust in science erode credibility. Political polarisation means environmental issues are read through ideological filters. Climate fatigue and feelings of hopelessness can lead to apathy. Lack of background knowledge makes complex connections hard to grasp.

This handbook is a response to that reality. It draws on input from a number of communications specialists and nearly two decades of experience communicating sustainability science at Stockholm Resilience Centre, combined with research on what actually works. It is written for anyone who wants to communicate science-based sustainability knowledge more effectively – whether you are a communicator, researcher, journalist, teacher, or concerned citizen.

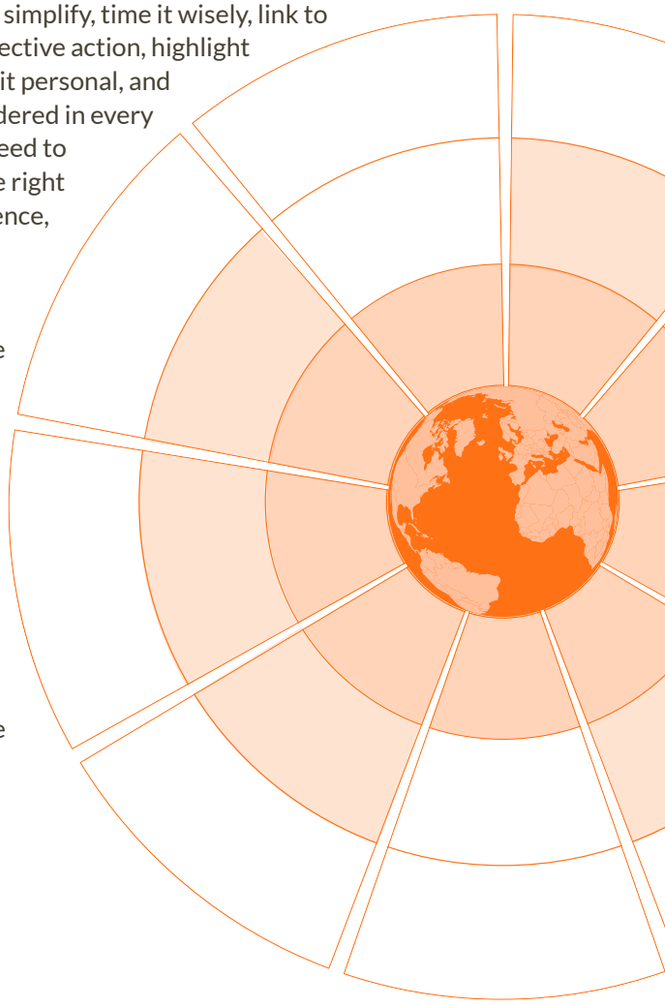
The model offers nine ingredients. No silver bullet, but a shared recipe to mix and adapt to your sender, message, and audience. It can be applied when drafting a press release, crafting a social media post, preparing a lecture, or in any other situation where sustainability science needs to reach the people it matters to.

A longer version of this handbook is available on our website, with more examples, full list of references, and more: https://www.stockholmresilience.org/planetary-communications

The Planetary Communications model

The Planetary Communications model takes its inspiration and its structure from the Planetary Boundaries framework. But it applies a reversed logic. Where the boundaries framework defines thresholds humanity must not exceed, the communications model defines nine essential ingredients where you need to exceed a minimum threshold to achieve impact (see Figure 1).

The nine ingredients are: be factful, simplify, time it wisely, link to other societal concerns, inspire collective action, highlight solutions, navigate emotions, make it personal, and visualise it. All nine should be considered in every communication effort, but not all need to be maximised. The goal is to find the right mix for your specific message, audience, and context. Think of it as an audio equalizer: the sliders are the same every time, but the optimal settings change depending on the music (see Figure 2).



The following pages take you through each ingredient in turn: what it means, why it matters, and what it looks like in practice. Each ingredient is also broken down into four levels, from 0 to 3, with examples illustrating each level.

A step-by-step example of how the model can be used is available in the longer version of this handbook.

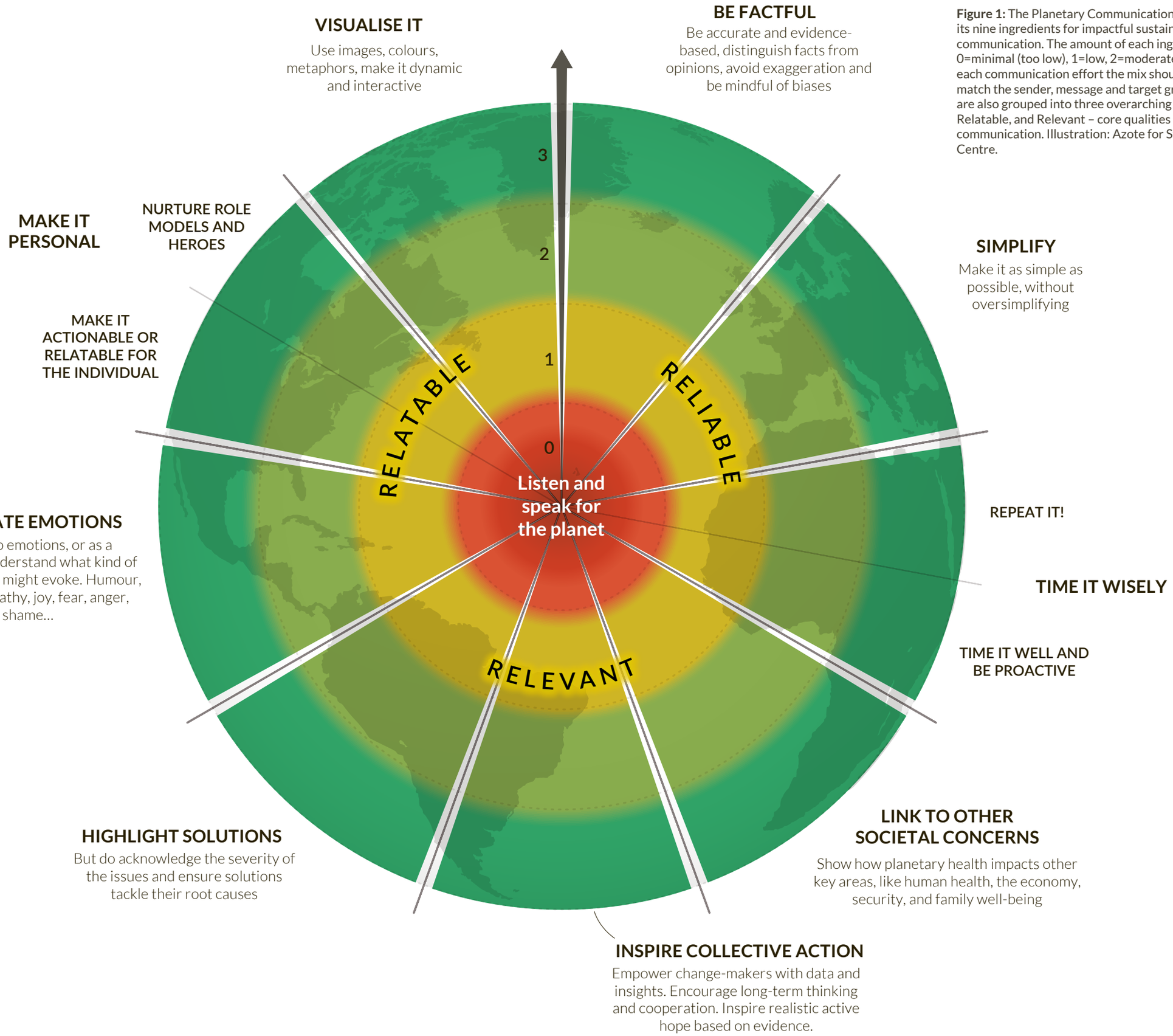


Figure 1: The Planetary Communications framework with its nine ingredients for impactful sustainability science communication. The amount of each ingredient can be either 0=minimal (too low), 1=low, 2=moderate, and 3=high. For each communication effort the mix should be customised to match the sender, message and target group. The ingredients are also grouped into three overarching qualities – Reliable, Relatable, and Relevant – core qualities of effective planetary communication. Illustration: Azote for Stockholm Resilience Centre.

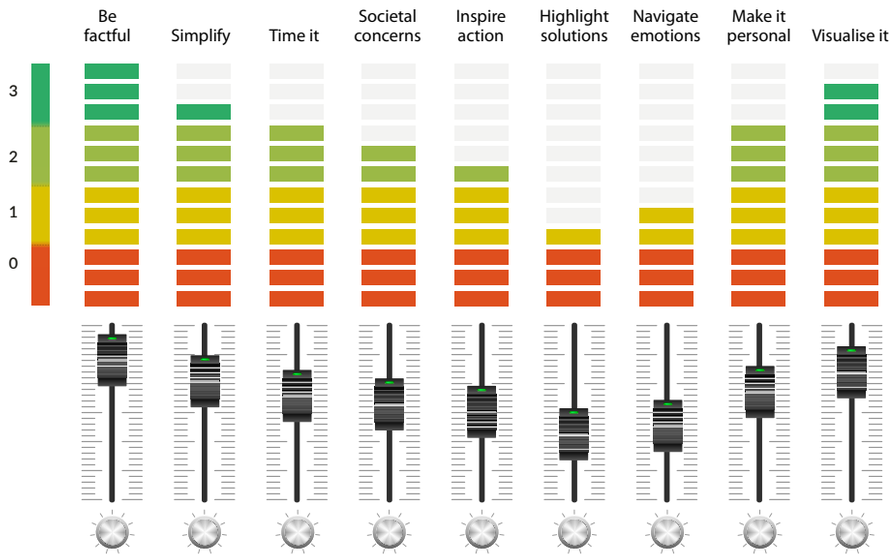


Figure 2: The audio equalizer analogy of the Planetary Communications framework, with its nine ingredients for impactful sustainability science communication. Just as different musical pieces or genres require their own equalizer settings, each communication effort needs its own mix of the ingredients, shaped by message, audience, channel, and context. *Please note: This figure is only an example of one possible combination of the nine ingredients.*

> The Planetary Communications model offers nine ingredients. No silver bullet, but a shared recipe to mix and adapt to your sender, message, and audience.

1. Be factful: Stay accurate and evidence based, avoid exaggeration

Factfulness has always been key in sustainability science communication. In a world awash with mis- and disinformation, this has become more important than ever.

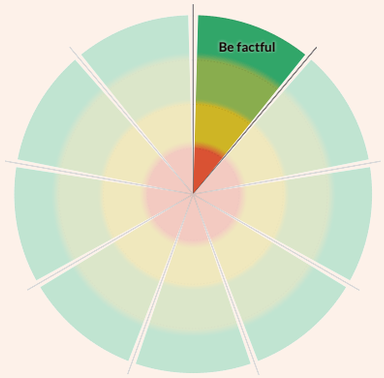
Grounding communication in accurate, credible knowledge while striving to avoid exaggeration and bias is more important than ever. Clear distinctions between facts, interpretations, and opinions are crucial, especially when communicating complex and value-driven issues like climate change, biodiversity loss, justice and sustainable development at large.

Factful communication recognises uncertainty where it exists, avoids cherry-picking data, and steers clear of too alarmist or overly optimistic narratives. *Remember that this doesn't mean being dry or disengaged, it means being reliable and responsible.* Factfulness anchors sustainability storytelling in science and reality, encourages informed decision-making and fosters critical thinking. It ensures that calls to action are not only compelling but also credible.

For those communicating on behalf of commercial entities, note that making environmental claims to consumers can carry legal obligations (increasingly so in the EU in particular) making rigorous, factful communication not just an ethical but also a legal responsibility.

BOX 2: EXAMPLE CASE

The Global Carbon Project – factful, transparent and informative



Audience: General public, policymakers, media, and researchers across sectors

Planetary Comms mix: High on "Be factful"

The Global Carbon Project (GCP) is a research and communication project led by Future Earth. It exemplifies factful communication by transparently presenting an annual Global Carbon Budget (GCB) with clear methodology, rigorously quantified uncertainties, open data, and a balanced but urgent framing that supports informed policy without resorting to exaggeration.

Despite its underlying complexity, the GCP manages to translate rigorous science into a clear, digestible format for policymakers, media, and the public. Charts and visualisations show global emissions trends, per-capita contributions, and carbon sink behaviour, while FAQs and press releases explain uncertainties and scenarios in accessible language. In this way, climate science is communicated reliably and responsibly, giving audiences a solid, evidence-based picture of where humanity stands in the climate challenge.

Impact: The GCB has become the authoritative benchmark for global emissions tracking. Policymakers use it to evaluate climate pledges, companies and investors reference it for sustainability planning, and journalists rely on its clear visuals and data for climate reporting. Its open-data approach ensures transparency, allowing researchers and decision-makers to interrogate the numbers directly.



Be factful

		Example for each level
3	**Master-level factfulness** Delivers thoroughly vetted, evidence-based information that balances accuracy with accessibility, avoids biases, and draws on open, publicly available data.	Lifecycle analysis of electric versus fossil-fuel vehicles, supported by peer-reviewed studies, addressing both benefits and limitations. Also relating the comparison to other sustainable mobility approaches, e.g., public transport.
2	**Accurate and contextual** Presents accurate, well-researched information with context and transparency, while distinguishing between facts and interpretations.	Highlighting that electric cars reduce emissions, but also noting the environmental and social impact of battery production.
1	**Basic accuracy** Information is accurate but lacks nuance, context, or clear distinctions between facts and opinions.	Stating "electric cars are a solution to climate change" without addressing their limitations or broader systemic factors.
0	**Inaccurate or misleading** Relies on unsupported claims, exaggerations, or biased information, eroding credibility.	Claiming that electric cars are much worse for the climate than gasoline cars due to emissions from battery production.

2. Simplify it: Break down complex ideas without oversimplifying

Communicating climate and sustainability science in an impactful way requires simplifying complexity without oversimplifying it.

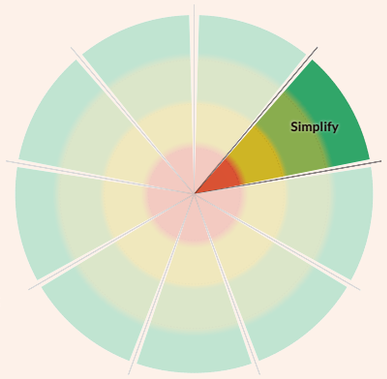
The goal of simplification is to make the science accessible while offering glimpses of its intricacy to inspire understanding and engagement. A key tool for this is plain language, including shorter sentences, everyday words, and active voice to help diverse audiences grasp ideas quickly without feeling talked down to.

For example, frameworks like the Exponential Roadmap Initiative summarises and simplifies many years of climate science into a recommendation, "The Carbon Law" (see box 3), of halving emissions every decade through sector-specific strategies. Similarly, the concept of ecosystem services can be made relatable by linking them to everyday needs like clean air, water, and food provided by the work of nature. Explaining functional biodiversity through analogies, such as a "deep bench" in sports, shows how diverse species strengthen ecosystems, much like having several skilled players on each position ensures a team's resilience under pressure.

Such approaches can spark "aha" moments, revealing the complexity of the issues while keeping the message focused and graspable. By striking this balance, it is possible for the science communicator to stay true to the science while empowering people to engage meaningfully with it and the solutions it offers.

BOX 3: EXAMPLE CASE

The Carbon Law and the Exponential Roadmap Initiative simplify complex climate science into a rule of thumb

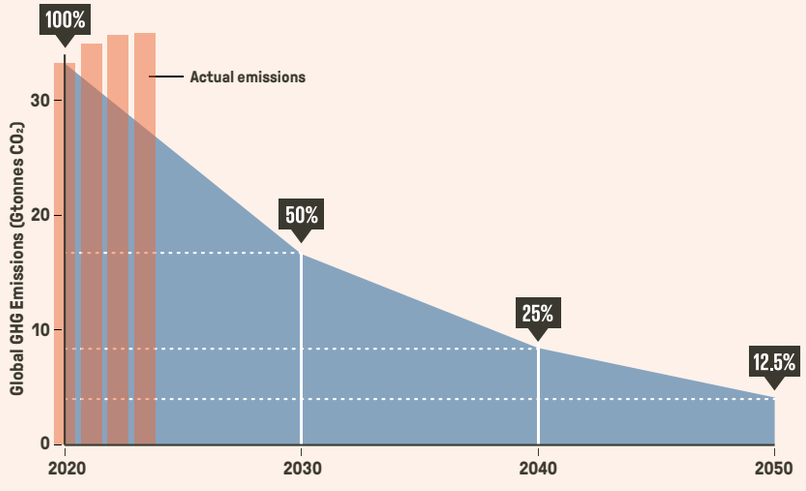


Audience: General public and companies in different sectors

Planetary Comms mix: High on "Simplify it"

The "Carbon Law" by Johan Rockström and colleagues is a rule of thumb stating that global CO_2 emissions must be halved every decade to reach near-zero emissions by mid-century and keep warming well below 2°C. It was introduced in the 2017 Science paper "A roadmap for rapid decarbonization," which drew on carbon budget calculations, Earth system models, and IPCC-based climate science. The underlying research is complex, involving nonlinear dynamics, feedback loops, and uncertainty ranges. However, the authors deliberately translated it into something that could be easily understood outside the scientific community. In this way, rigorous science was turned into a clear, memorable guideline for various business sectors, policymakers and the public.

Impact: Building on the Carbon Law, the Exponential Roadmap Initiative (ERI) was launched to translate the science-based halving-every-decade idea into concrete business action, via its 1.5°C Business Playbook, transition-planning tools, and peer collaboration. In total, the initiative has brought together companies representing more than 2 million employees and over USD 1.2 trillion in annual revenue.



Simplify it

		Example for each level
3	**Simplifying mastery** Easy to understand but subtly introduces the complexity of the issue, encouraging the audience to think deeper without overwhelming them.	"The Earth has organs too: forests that breathe, ice sheets that regulate heat, oceans that circulate nutrients. Push one too far, and like a failing organ in a body, it can collapse the whole system. Tipping points aren't just abrupt changes in one place, they affect Earth's vital functions on a global level."
2	**Simple but adds some depth** Clear and accurate, with a concrete hook that makes the concept memorable.	"Think of Earth as a human body, and the planetary boundaries as blood pressure. Above 120/80 does not indicate a certain heart attack but it does raise the risk, and the doctor suggests lifestyle changes."
1	**Very basic, simple explanation** Accurate and clear, but flat. Delivers the core fact or concept without framing or analogy.	"Halving emissions every decade is a principle that can be applied at any scale, individual, business, region, country." (But see Box 3 for how this same message can be given more depth.)
0	**No simplification** Too complex or jargon-heavy for a general audience, leaving most readers confused or unable to engage with the core message.	"In the next 100 years, the pH level of the oceans will drop from 8.1 to 7.7."

3. Time it wisely: Strategically deliver messages when audiences are most receptive

Even the most compelling message can fall flat if delivered at the wrong moment or heard only once. Timing and repetition are two of the most powerful tools in a sustainability science communicator's arsenal.

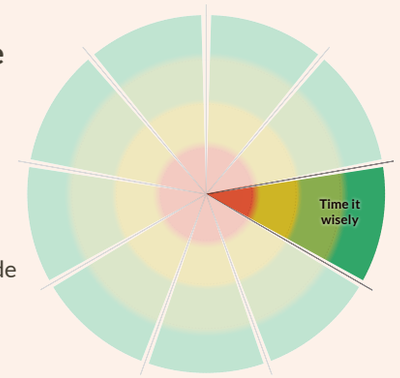
Repetition has long been called the mother of learning. Encountering information more than once helps us understand and retain it. This matters especially in sustainability science, where complex issues often generate complicated findings. Repeating key messages and the insights behind them can make them more understandable, memorable, and familiar. The same effect, however, applies to climate-dismissive messages: repeated exposure can make people rate false claims as more credible. The repetition strategy should however be used deliberately, and with care since overdoing it risks audience fatigue, reduced attention, or outright resistance.

Equally important is *when* you communicate. Linking messages to news cycles, catching the zeitgeist, or anchoring them to something resonant in public life can dramatically increase their reach and impact. A good example is the annual 10 New Insights in Climate Science report, timed to coincide with the COP climate meetings and updated each year with the latest research (see Box 4).

Even with the best intentions, timing can go wrong and you cannot predict all that will happen. For example, a major international study was once ready to launch when the Queen of England died an hour before the press release was scheduled. Launching a climate campaign about melting snow when there's a metre of it on the ground, or issuing a press release about drought impacts during a major flood, are other examples.

BOX 4: EXAMPLE CASE

The 10 New Insights in Climate Science are published every year during climate COP meetings



Audience: Decision makers and the public

Planetary Comms mix: High on "Time it wisely"

The 10 New Insights in Climate Science (NICS) provide concise, science-based takeaways on critical climate topics, translating complex research into actionable guidance. Each year, the latest scientific studies and climate model analyses are distilled into accessible insights for policymakers, business leaders, and the public. By framing complex climate science in clear, memorable terms, the 10 NICS help decision-makers grasp urgent issues and emerging trends in a rapidly changing climate.



Impact: By being published annually at climate COP meetings, the 10 NICS create a regular rhythm of evidence-based updates that inform policy and strategy worldwide. This yearly repetition (with different content) reinforces awareness, helps track progress, and ensures that the latest scientific findings are continuously integrated into climate decision-making and planning processes.

Time it wisely

		Example for each level
3	**Master-level timing** The timing is impeccable and highly strategic, perfectly aligning with the audience's needs, key dates, and contextual trends. The main message is repeated several times in various contexts and wordings.	Example: Launching the "10 New Insights in Climate Science" report during COP meetings on climate. It is repeated every year, but with new additions from the latest research.
2	**Good timing** Connects to a relevant moment, but the opportunity isn't fully exploited.	Releasing a new report on biodiversity loss during the UN biodiversity summit, but without a press strategy, stakeholder outreach, or a summary tailored to non-specialist audiences.
1	**Basic timing awareness** Timing is considered, but it lacks precision.	Sharing findings on Arctic ice melt sometime in spring, loosely timed to Earth Day, but missing the peak media window and disconnected from any current policy debate or news hook.
0	**Poor timing** Timing is not considered at all, at worst the message and the moment end up working against each other.	Publishing a report on rising temperatures during an exceptional cold snap or issuing a press release about water scarcity during a major flood.

4. Link it to other societal concerns: Show intersections with health, economy, equity, etc

Communicating sustainability science becomes more impactful when the connections between environmental challenges and wider societal concerns are clearly communicated.

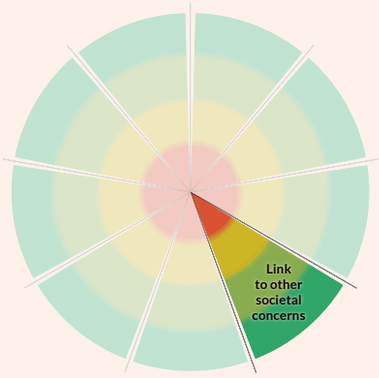
The time of thinking and talking about the state of the planet in isolation from wider societal concerns is over – if it ever really existed. Addressing environmental challenges as separate issues risks missing the broader picture of how they intertwine with social, economic, and political systems. Communicating sustainability science becomes more powerful when these connections are made visible, for example when heat waves are linked to health issues, extinction of insects to pollination of cash crops (see box 5), wildfires to loss of life and property, or climate change to worsening social inequalities.

Framing environmental issues within everyday societal contexts helps audiences see their relevance, urgency, and moral dimensions. For instance, discussing air pollution through its impact on children's health or connecting renewable energy to job creation in marginalised communities can ground abstract science in lived experiences.

Such framing not only broadens the audience but also deepens engagement. It invites people to see environmental solutions not as isolated fixes but as pathways to fairer, healthier, and more resilient societies. This integrated approach can help sustainability science communicators bridge divides, foster empathy, and inspire action rooted in both scientific knowledge and shared values.

BOX 5: EXAMPLE CASE

The economic cost of insect declines: making biodiversity loss tangible



Audience: Decision makers, businesses and the general public

Planetary Comms mix: High on "Link it to other societal concerns"

Globally, both the number and diversity of insects are declining due to habitat loss, disease, pollution, and climate change. To highlight the urgency, IPBES (the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) emphasised the immense societal and economic value of insects. For example, the loss of pollinators alone threatens $235–$577 billion (USD) in global crop output annually. According to the same assessment, pollination services account for 5–8% of total crop market output across different world regions.

Insects also provide essential services beyond pollination, including nutrient cycling, pest control, and soil health. Their decline jeopardises livelihoods, food security, and ecosystem resilience, making the consequences of insect loss economically and socially significant.

Impact: By putting a monetary value on pollination, IPBES made the abstract concept of biodiversity loss tangible for policymakers, businesses, and the public. This approach strengthened the rationale for funding pollinator protection, ecosystem restoration, and broader biodiversity initiatives. The findings were widely reported in outlets such as The Guardian, New York Times, and CNN, demonstrating how linking ecological issues to societal concerns can drive awareness and action.


The Guardian

News Opinion Sport Culture Lifestyle

Environment Climate crisis Wildlife Energy Pollution

Bees

Decline of bees poses potential risks to major crops, says UN

Animal pollination responsible for 5-8% of global agricultural production by volume, says UN biodiversity panel, as it issues warning over their decline

Declines in bees have many possible causes including habitat loss, pesticides, pollution, invasive species, pathogens and climate change. Photograph: Mike Blake/Reuters

Populations of bees, butterflies and other species important for agricultural pollination are declining, posing potential risks to major world crops, a UN body on biodiversity said Friday.

Image: The Guardian

Link it to other societal concerns

		Example for each level
3	**Strong human connection** Describes planetary changes in deeply personal and relatable terms, focusing on how people's lives, health, and finances are directly affected.	"Heatwaves are increasing hospital visits for heatstroke among our elders, pushing up food prices for families, and affecting the safety of our children"
2	**Clear connection** Links climate change to human consequences in a straightforward way, though slightly less emotionally charged. Impacts are still tangible and relevant to people's lives.	"Rising sea levels and more frequent heatwaves due to climate change are already affecting health, food prices, and homes in coastal cities, putting pressure on public resources."
1	**Minimal connection** Mentions potential future human impacts of climate change, but the link is more abstract or indirect.	"Climate change is causing rising sea levels and extreme weather, which could impact global economies and public health in the future."
0	**No direct connection** Presents climate change or biodiversity loss in scientific or environmental terms without linking it clearly to human experience or consequences.	"The planet's average temperature has increased by about 1.4°C since pre-industrial times, causing accelerated ice melt and rising sea levels."

5. Inspire collective action: Motivate target groups with shared goals

Communicating in ways that spark collective action may be one of the most powerful levers sustainability communicators have at their disposal. Individual awareness is a starting point, but how you frame and deliver your message can be the difference between leaving audiences informed and leaving them mobilised.

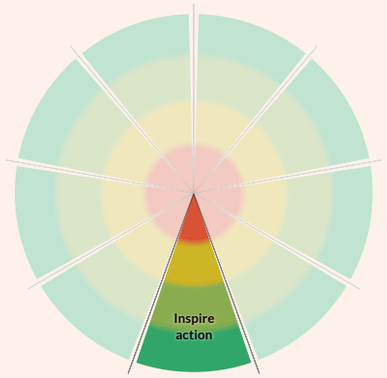
Individual actions are important, but the collective ones are more likely to make an impactful change at scales that matter. Inspiring collective actions through communication involves the process of linking an individual's role in collective actions with "active hope". This could be achieved by outlining concrete steps leading to effective actions and showcasing how easy it can be for an individual to take the action, how likely the action will lead to change, and what collective benefits it will bring. Research also shows that people are more likely to engage in climate action when they understand that others care too. In fact, 89% of people want governments to do more to address climate change.

The global "River cleanup" campaign (see Box 6) illustrates this approach well: a simple 10-minute challenge, done individually or in a group and shared on social media, that grew into a worldwide community taking collective action. By inviting people to care for their closest surroundings, the campaign gives participants a lived experience of making a visible difference. Crucially, the campaign doesn't stop at picking up plastic locally, it uses that momentum to also push for systemic change, targeting policymakers and companies on the root causes of plastic pollution.

What started with one person picking up litter became constructive hope made real – built not by waiting for change, but by being part of it.

BOX 6: EXAMPLE CASE

River cleanup campaign in Belgium



Audience: General public, companies and foundations caring for a cleaner environment

Planetary Comms mix: High on "Inspire collective action"

In 2017, Thomas de Groote from Belgium got challenged by his sister to pick up trash for only 10 minutes. He dressed up as a super hero and brought his kids with him. The small action opened eyes to a global problem: plastic pollution. After a few years of organising clean-up actions and learning about the effects of plastic pollution, Thomas founded a non-profit organisation "River cleanup". The initiative invites people around the world to contribute to plastic-free rivers by either joining the 10-minute challenge, organising clean-up events in their local communities, engaging their colleagues at work, or funding the River cleanup organisation.

Through its website, social media channels and educational activities, the organisation is building a worldwide community of "river warriors" that help to further spread awareness of plastic pollution and contribute to its solutions, not only by focusing on the plastic removal, but also targeting the core problem of growing plastic production and consumption.

Impact: What started as a personal 10-minute challenge grew to a community of 288,000 people in 101 countries cleaning waste along more than 450 rivers with the ambition to clean up 1000 rivers worldwide by 2050. As of the end of 2024, the initiative has permanently removed up to 3,6 million kg of waste from the rivers. Interestingly, the campaign has moved beyond physical cleanups, using citizen science, AI, and research partnerships aimed at influencing policymakers and companies toward structural solutions.



Photo: www.river-cleanup.org

Inspire collective action

		Example for each level
3	**Strongly inspires collective action** Clearly calls for shared responsibility and collective effort. Emphasises that change is possible and shows how people can work together to make a real impact. Creates a sense of urgency and empowerment.	"Communities across the country are coming together to plant trees in urban areas, reduce energy use, and advocate for cleaner air. When we act together, we build resilience and create a healthier future for everyone."
2	**Moderately inspires collective action** Encourages action and highlights collective benefits, but the message is less vivid or emotionally compel-ling. Suggests solutions but may lack a strong call to act together.	"By supporting sustainable farming and reducing food waste, we can help protect the environment and ensure a more secure future for all."
1	**Minimally inspires collective action** Mentions sustainability or solutions in a vague or detached way. Focuses more on the issue and individuals than on mobilising group effort or shared responsibility.	"Switching to renewable energy sources is one way you can reduce your carbon footprint and help mitigate climate change."
0	**Does not inspire collective action** Provides factual information without linking it to action or involving the audience. Lacks any reference to human agency or collaboration.	"Global CO_2 levels have reached their highest point in recorded history, driven by the continued burning of fossil fuels."

6. Highlight solutions: Prioritise those that target the root causes

Bad news alone can overwhelm and paralyse people, causing them to tune out entirely. Pairing honest assessments of the problem with clear, credible pathways forward that tackle root problems is a key ingredient in impactful sustainability science communication.

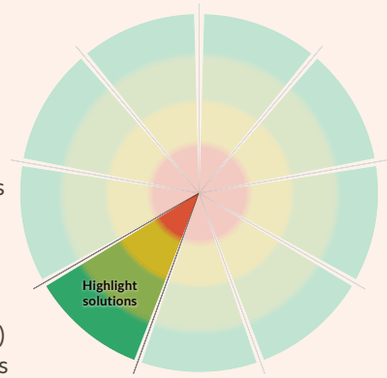
Sustainability science can be overwhelming, filled with complex data, dire warnings, and urgent global-scale problems. Without a sense of agency or direction, these kinds of messages risk leading to apathy or despair. Highlighting solutions and emphasising actionable, positive pathways gives people something concrete to move on and take hold of. It can help to make urgent complex challenges more approachable.

Focusing on what can be done, by individuals, communities, and systems helps shift the narrative from fear to possibility. For instance, showcasing cities that have rapidly scaled up cycling infrastructure or farmers restoring soil health through regenerative practices illustrates that change is not only needed, but already happening. Concrete examples like these demonstrate that solutions are within reach and that people have a role to play. They also help paint a picture of desirable futures, where solving sustainability challenges creates better conditions for people.

Positive framing doesn't mean ignoring or down-playing the huge challenges, it is more about telling stories that motivate people to listen to the science and do what it takes to contribute to the systemic societal changes needed to transition to sustainability. By illustrating how science-based strategies can align with real-world successes, communicators can build well-informed and active hope, resilience, and momentum. It is this sense of possibility that can turn concern into commitment and science into action.

BOX 7: EXAMPLE CASE

Seeds of good Anthropocenes – highlighting existing sustainable solutions from around the world



Audience: General public, policy makers and scientists

Planetary Comms mix: High on "Highlight solutions"

The initiative "Seeds of Good Anthropocenes" is both a scientific and a communication effort that identifies and amplifies existing sustainability initiatives ("seeds") that have the potential to contribute to positive futures in the Anthropocene (the age of humans). The rationale behind the initiative is that only focusing on problems and dystopic visions about climate, biodiversity loss, increased inequality etc, tends to make it very difficult to imagine how the world could work differently and inspire solutions towards achieving radical change. The highlighted sustainability solutions can be social initiatives, new technologies or tools, economic or financial instruments, organisations or movements, etc.

Impact: Led by McGill University, the Stockholm Resilience Centre, and Stellenbosch University since 2014, the initiative has resulted in a global database of over 500 real-world solutions-oriented "seeds". By sharing these through public platforms, workshops, and research, the initiative has inspired policymakers, scientists, and the wider public to imagine and engage with more hopeful futures. It demonstrates how positive storytelling can empower action and support more constructive dialogue about sustainability transformations.



Highlight solutions

		Example for each level
3	**Master-level Solutions** Balances urgency with scalable, systemic solutions that inspire collective action and meaningful progress.	Calling for laws that hold producers accountable, tax reforms that price in the full environmental cost of oil-based plastics, and international agreements to reduce plastic production at source.
2	**Targeted and relevant solutions** Offers actionable solutions tied to root causes, but not fully matching the problem's scale or systemic change.	Advocating for a phase-out of single-use plastics and corporate accountability for plastic waste.
1	**General solutions mentioned** Provides broad or small-scale solutions that don't fully address root causes or match the problem's scale.	Encouraging individuals to recycle more as the primary response to ocean plastic pollution.
0	**No solutions or misaligned solutions** Focuses only on the problem or superficial solutions unrelated to root cause.	Warning about ocean plastic pollution with no solutions offered, or implying that a simple fix like banning plastic straws will be enough.

7. Navigate emotions: Address fear, hope, and other emotional reactions constructively

The sustainability science community might be divided on whether to apply an emotional lens, but Planetary Communications is emotional whether we like it or not. The question is not whether to engage with emotions, but how to do so constructively and in a reliable way.

A group of boys are trapped in a cave in Thailand, with parents praying at the flooded entry. Divers get them air and food. Eventually, they are saved. This story was covered by media outlets worldwide. Not because it directly impacted most people's lives, but because it is relatable. It could have been my son or brother. We care because we are empathetic creatures.

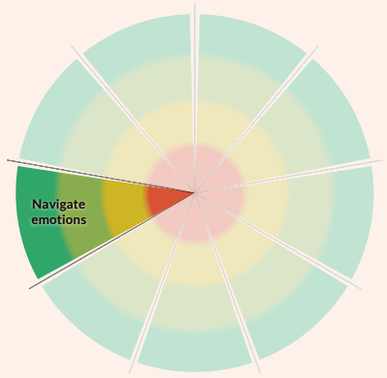
Emotions shape our understanding and actions, something marketers have long known. For sustainability communicators, the challenge is balancing scientific rigour with genuine audience engagement. A startling fact alone can trigger strong reactions: faced with the news that coral reefs are reaching their thermal tipping point and experiencing unprecedented dieback, many felt anger, fear, and grief. Strong negative emotions like these can push people past passivity, but positive emotions (hope, pride, motivation) tend to sustain long-term change. As communicators, we have both a responsibility and an opportunity to address both: acknowledging and validating difficult feelings while also pointing to sources of active hope, for instance positive social tipping points like the rapid uptake of solar power and electric vehicles.

A note of caution: emotional responses on social media are often immediate but may not translate into lasting behaviour change. AI can amplify scientific content but also disinformation and manipulative emotional messaging.

Finally, don't overlook surprise and humour, both are underused tools. The journalist's aphorism "man bites dog" captures it well: we remember what is unexpected. Facts alone are often like "dog bites man" – accurate, important, but easy to overlook.

BOX 8: EXAMPLE CASE

Punk stew for the planet: working with humour and a legendary indie rock band to communicate research on healthy and sustainable food



Audience: The general public, music industry and food system stakeholders

Planetary Comms mix: High on "Navigate emotions"

The food research centre PLATE, together with Swedish indie legends Bob Hund, explored a bold question: Could science and creativity change attitudes toward sustainable food? The result was a humorous, thought-provoking food truck for resilient meals, launched during the band's farewell tour. Co-designed with scientists, the menu featured dishes like "Punk Stew" to make healthy and sustainable eating desirable and fun.

"Transformation doesn't work if we take ourselves too seriously. We need both humour and seriousness – enough concern to act, but not so much fear that people shut down," said Bob Hund's creative director, Martin Kann. This linked planetary health, culture, and personal choice while also using playfulness to prevent fear-based disengagement and keep people open to change.

In this collaboration, Bob Hund acted as a cultural translator, converting science into something emotionally resonant and accessible. This kind of bridge-building between expert knowledge and everyday life is one of the most underused tools in sustainability science communication.

Impact: The food truck reached a large audience at the events it visited, including the 2025 Way Out West festival with 78,000 attendees and Bob Hund's sold-out farewell concert on 30 August 2025 in Stockholm with 18,000 fans. It also sparked widespread media coverage across newspapers, radio, television, and social media – where it not only gained attention but also triggered healthy debate and some critical voices, adding depth to the conversation.



Photo: Jeanette Andersson

Navigate emotions

		Example for each level
3	**Master-level emotional navigation** Holds emotional tension between loss and agency, threat and hope, driving both urgency and action.	Showing how climate change threatens the places, people, and ways of life we love most, while making clear that acting together can itself be a source of joy, pride, and renewed purpose.
2	**Strong emotional** Use of strong emotions like fear, hope, or empathy to enhance engagement while maintaining a clear focus on the message.	Scientist Terry Hughes, after surveying the bleaching of the Great Barrier Reef with students and colleagues, tweeted the data and added: "And then we wept."
1	**Mild emotional concerns** Subtle use of emotions like curiosity, empathy or nostalgia to complement the message without overwhelming the facts.	Reporting on declining insect populations by briefly noting that many readers likely remember more fireflies or butterflies in their childhood summers.
0	**No emotional concerns** Focus is purely on facts and logic, with no attempt to evoke or consider emotions.	Communicating research showing that coffee is really bad for the climate without considering the emotions it will stir.

8. Make it personal: Connect to individual experiences and values

To really engage with sustainability science and environmental challenges, most people need to see how the issues presented relate to their own lives, values, and aspirations. Or to someone they look up to, or relate to in other ways.

One common way to make people engage with the state of the planet is to ask what they as individuals can do to help contribute to solving a climate or environmental problem. This is why lists with messages like “10 Ways You Can Help Fight the Climate Crisis” are common in the media. Making it personal by connecting to everyday choices, local realities, or deeply held beliefs can turn abstract challenges and research results into meaningful concerns.

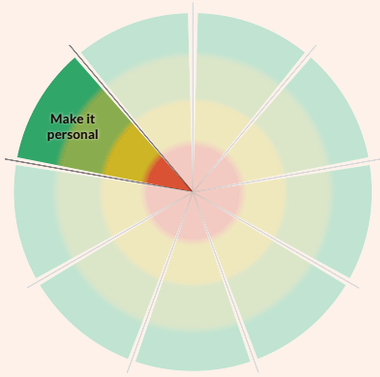
For example, talking about the loss of pollinators might not resonate until it’s linked to a favourite fruit, like strawberries, disappearing from the breakfast table. Climate change becomes more tangible when framed around changing seasons, rising energy bills, or a grandparent’s memories of how the weather used to be. By inviting people to reflect on what they love, fear, or hope for, science communicators can foster a sense of relevance and emotional connection.

This approach helps build both trust and motivation. When people feel that sustainability isn’t just about distant problems or future generations, but about their own health, security, and identity, they tend to be more likely to care and act. Such human-to-human connections can also be achieved by relating to role models or environmental heroes that people look up to (see Box 9).

It is, however, important not to reduce how people can take action solely to their role as individuals or consumers. It is equally essential to ask what actions they can take as citizens, parents, role models, and members of a community (see also previous sections on "Highlight solutions" and "Inspire collective action").

BOX 9: EXAMPLE CASE

How a 15-year-old with braids became an environmental hero and started a global climate movement



Audience: General public and decision makers

Planetary Comms mix: High on "Make it personal”

It has been labelled “The Greta Thunberg Effect” and it refers to how those who are more familiar with her have a stronger sense of collective efficacy (the shared belief within a group that its members can work together effectively to achieve a common goal) and in turn have higher intentions of taking collective actions to reduce global warming. Thunberg began a global movement by camping out in front of the Swedish Parliament, holding a sign that read “School Strike for Climate.” Her catchphrase was ”Don’t listen to me, listen to the science.” After a while, more people joined and the rest is history. She became TIME Magazine’s Person of the Year 2019 and has addressed heads of state at the UN, met with the Pope, and inspired many million people to join the global climate strikes.

Another example is the Chilean climate and gender equality activist Julieta Martínez, who has built an entire movement across Latin America and the Caribbean. She started at 14, is now in her early twenties, and in 2026 received the prestigious Swedish WIN WIN Youth Award.

Impact: Greta Thunberg and Fridays for Future helped mobilise 6–7 million people worldwide, earned her TIME’s Person of the Year in 2019, and brought youth-led climate action to the center of global political and cultural discourse.



Photo: Time

Make it personal

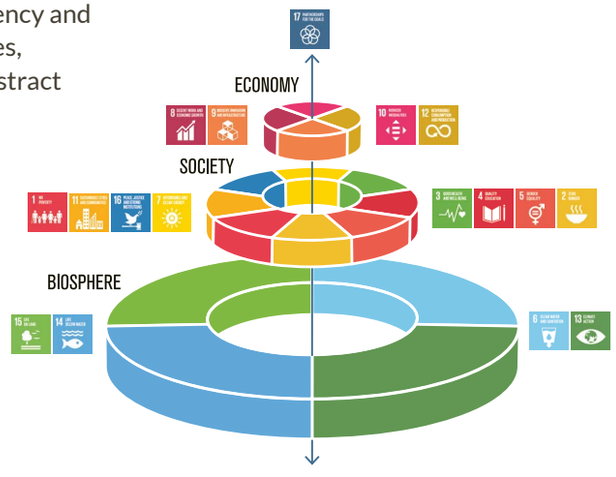
		Example for each level
3	**Master level** Fully personal, with clear emotional and practical hooks. Highlights heroes and personal potential to encourage people to join (or start) a movement that becomes self-sustaining over time.	"Greta Thunberg was only 15 when she sat outside the Swedish parliament alone with a handmade sign. It started with one person deciding their voice mattered and sparked a global movement."
2	**Moderately personal** Includes basic human relevance or personal benefit; actionable but individually framed.	"By taking simple steps like switching to LED lights or biking to work once a week, you can cut your carbon footprint and save money at the same time."
1	**Mildly personal** Mentions people abstractly, but lacks relevance or clear actionability for the audience.	"Our greenhouse gas emissions are changing the climate at a planetary scale. It is now up to all of us to help bend the curve."
0	**No personal connection** Does not even attempt to connect with individuals; may alienate or overwhelm. Feels irrelevant or abstract.	"Atmospheric carbon dioxide levels have surpassed 420 ppm, disrupting global climate systems and biodiversity at a planetary scale."

9. Visualise it: Use visuals to make data and concepts tangible

Visualisations are among the most powerful tools in any communicator's toolkit. This is particularly true in science communication, where a well-chosen visual can do what complex data and pages of text cannot: make the invisible visible and the complex intuitive.

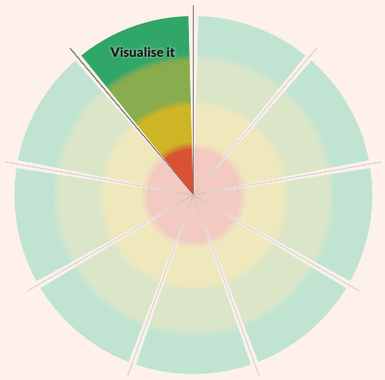
Visualisations can be everything from static images and simple metaphors to advanced interactive and immersive experiences that engage multiple senses. As such, visualisations are essential ingredients in sustainability science communication because they make complex, interconnected issues easier to understand, remember, and act upon. Iconic visuals like the planetary boundaries framework, Kate Raworth's Doughnut Economy, and the SDG Wedding Cake (see figure) distill dense scientific data into intuitive formats, showing at a glance how ecological, social, and economic factors overlap and interact.

These visuals highlight the urgency and scale of sustainability challenges, bringing clarity to the often-abstract concepts of resource limits, ecological impact, and global goals. By engaging audiences emotionally and intellectually, visualisations can foster a deeper understanding and a sense of shared responsibility, making them powerful tools for inspiring action on sustainability.



BOX 10: EXAMPLE CASE

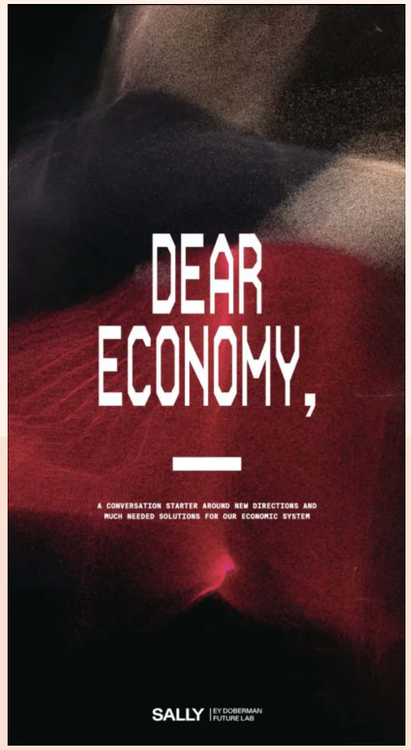
“Dear Economy” – an immersive experience re-imagining the economy within planetary boundaries



Audience: General economy, decision makers

Planetary Comms mix: High on "Visualise it”

“Dear economy” is an immersive experience created by Sally, the accounting giant EY’s future lab. It is part drama and part escape-room that invites the participants to step into the challenges and possibilities of re-imagining the economy within planetary boundaries. A future that we are currently headed to is described, but also where we could go instead. It makes the statistics hit you in the gut. Participants step straight into a room where they are in contact with the future through digital means and physical objects (a screen, a phone, a printer printing pages, and objects in an office). It is a future where good intentions and transition efforts have proven insufficient, inviting visitors to imagine a world beyond today’s economic logic. The visual and immersive journey invites participants to move through the sensory and emotional landscape of a collapsing world, and into the early outlines of something new.

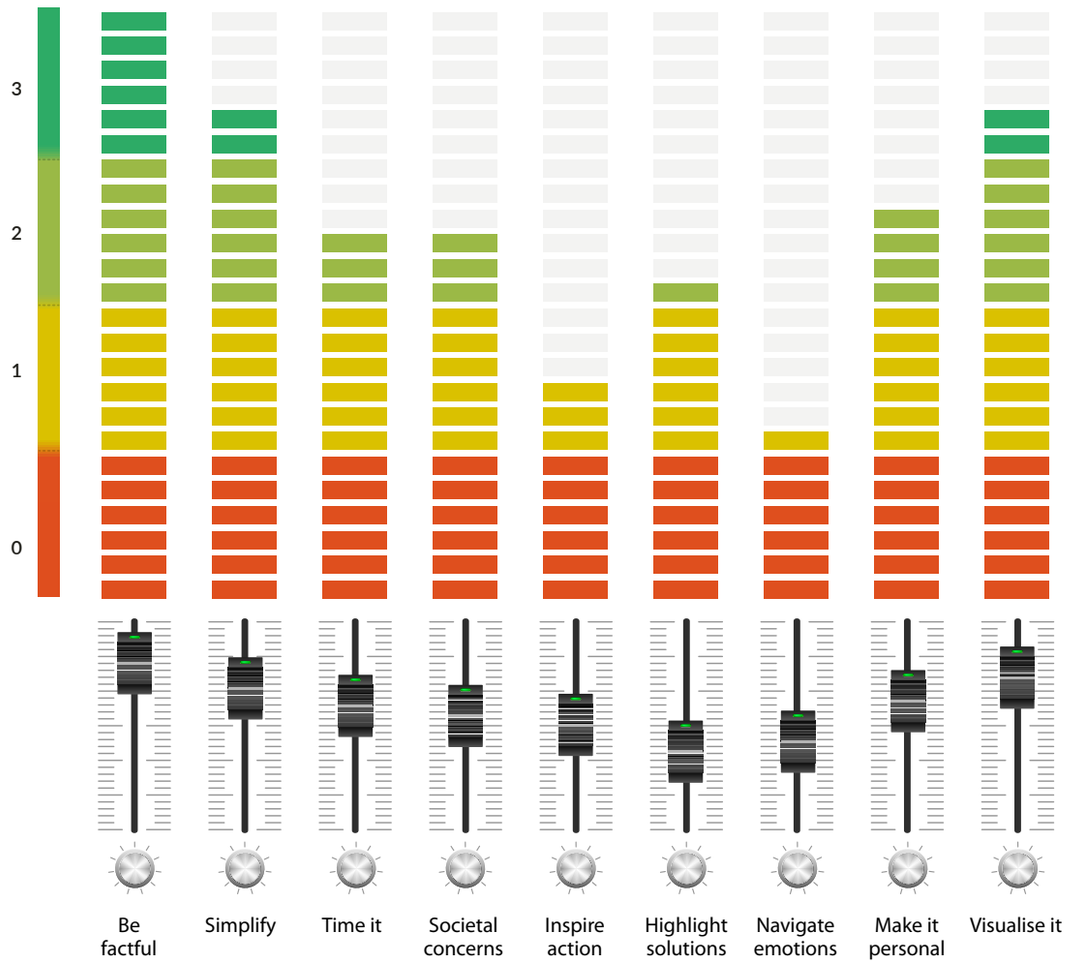


“It was only when we showed people a crashed economy that they could accept that another economy might be possible,” says Tove Blomgren, creative lead at Sally.

Impact: The immersive experience has been presented during the annual political week “Almedalen” in Sweden and has also won an award in Norway. It invites participants to step into a powerful, 30-minute immersive exploration of the limits of today’s economic system, and what it would take to imagine a new one beyond short-term logic and planetary overuse.

Visualise it

		Example for each level
3	**Immersive visualisation** Advanced and interactive visuals such as animations, 3D models, or immersive experiences, allowing deeper engagement and understanding of scientific concepts.	A Virtual Reality experience of what it will look like if we cross the planetary boundaries, where you can move around in an immersive environment.
2	**Enhanced visualisation** More detailed or engaging visuals, including infographics, diagrams, and illustrations, to break down complex ideas.	An infographic combining illustrations, icons, and explanatory text, e.g. the planetary boundaries framework or the SDG "wedding cake."
1	**Basic visualisation** Simple visuals such as charts, graphs, or static images to support key data points and concepts.	Static bar charts of loss of species over time, or pie charts showing carbon emissions by sector.
0	**No visualisation** Communication relies solely on text or verbal explanations without any visual aids.	A press release about a new climate study with only text, not even including a metaphor.



What's your mix for the planet?

AI: Prompting planetary communication

Used responsibly, AI tools can help systematically design, test, and refine your planetary communication efforts for greater impact.

AI tools can serve as a practical ally in applying the Planetary Communications model, helping you systematically test, refine, and adapt sustainability messages for different audiences and channels. Start a new conversation in your AI tool and upload this handbook as a PDF. Then copy the prompt below, fill in your content, and paste it into the chat.

> "You are an expert science communicator applying the Planetary Communications model. Evaluate this content [paste content, or describe the research results/messages and communication work so far] against each of the nine ingredients (simplify, make it personal, visualise it, inspire collective action, link to other societal concerns, navigate emotions, highlight solutions, be factful, time it wisely) as described in the uploaded handbook. Identify strengths, gaps, and suggest concrete improvements or generate alternative versions tailored for the audience [describe audience, or write "suggest audiences"] and channel [describe channel, or write "suggest channels"]. Also consider challenges like denial, misinformation, or mistrust – and how this message might be summarised, reframed, or distorted if encountered through an AI chatbot or AI-generated search overview."

A note of caution: we are acutely aware that AI carries a significant environmental footprint and that its development is shaped by commercial interests that do not always align with sustainability goals. Use it as one tool among many, not as a replacement for human judgement, local knowledge, or genuine dialogue with your audience.

Five takeaways

This handbook is an invitation to collaboration and dialogue. We encourage everyone reading it to share it with colleagues, mix and match it with your current best practices, and use it as a tool for reflection and innovation. Like sustainability itself, good communication develops through practice and shared effort. In summary, this handbook has concluded that:

1. **Communication is key to sustainability** – Securing a just future on a liveable planet requires developing how sustainability science is communicated, not just what is known.
2. **Nine ingredients, endless recipes** – The Planetary Communications model offers nine core ingredients that can be mixed in different ways to help make complex sustainability messages more reliable, relatable, and relevant.
3. **There is no one-size-fits-all** – Impactful communication emerges when the approach is thoughtfully adapted to a specific audience, message, and context – there is no single optimal formula for how to mix the nine ingredients.
4. **Invest in communication** – More time, resources, and expertise in communication is critical for turning scientific insights into real-world engagement, better decisions, and societal benefits.
5. **Communicate for resilience** – Stronger sustainability communication enables better decision-making and can help build long-term resilience for organisations, societies, and the planet.

Full list of references and several case studies are available in the longer version of this handbook: https://www.stockholmresilience.org/planetary-communications

Notes:

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Science alone cannot save us – how we communicate and act upon it will determine the fate of our planet.

– Johan Rockström

Stockholm Resilience Centre | Stockholm University

Advancing science for a liveable planet