A new way of analysing complex global challenges – DebateGraph – has caught the attention of the White House, the UK Prime Minister's Office and CNN. Here, DebateGraph co-creater **David Price** discusses how "collaborative argument visualisation" can help to support a planet under pressure.

Mapping a PLANET UNDER PRESSURE

If true character is revealed in the choices made under pressure, the early decades of the 21st century promise to be revelatory for our species.

As the *State of the Planet Declaration*[1] notes:

> *Research now demonstrates that the continued functioning of the Earth system as it has supported the well-being of human civilization in recent centuries is at risk. Without urgent action, we could face threats to water, food, biodiversity and other critical resources: these threats risk intensifying economic, ecological and social crises, creating the potential for a humanitarian emergency on a global scale. In one lifetime our increasingly interconnected and interdependent economic, social, cultural and political systems have come to place pressures on the environment that may cause fundamental changes in the Earth system and move us beyond safe natural boundaries.*

The existing patterns of interaction leave much to be desired.

Yet, in the jaded aftermath of the UN's Rio+20 conference, it's clear that scientific insight into the emerging systemic pressures isn't a sufficient condition for action – and that our jumbled, planetary bundle of individual and institutional interests has a momentum that's hard to deflect.

So, what next?

If the goal is to accelerate societal learning, the interplay between scientists, policy-makers and the wider public will be critical. However, the existing patterns of interaction leave much to be desired.

First, the science-policy relationship is often difficult and dysfunctional[2].

Second, the international governance infrastructure – the United Nations, World Bank, WTO and others – was designed to meet the needs of the post-WWII era and is ill-adapted to the interconnected and transdisciplinary challenges it now faces.

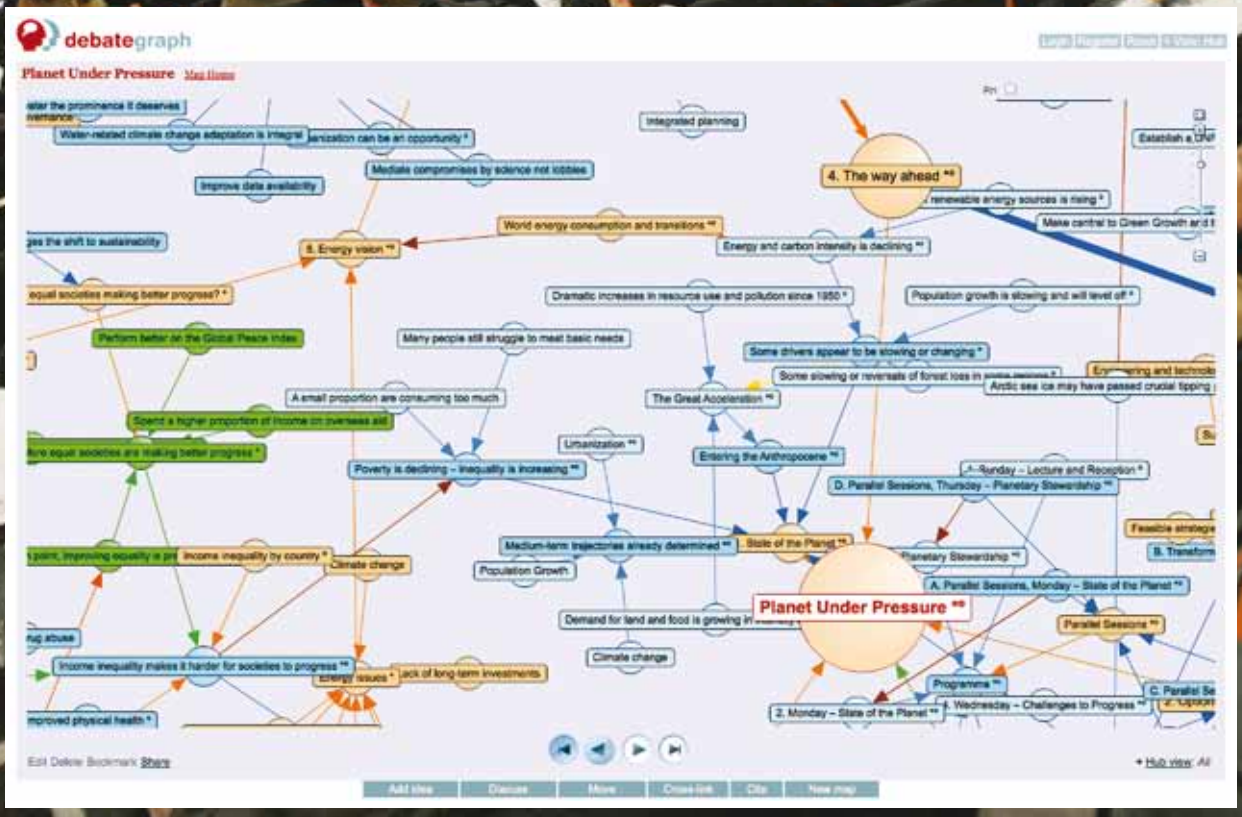
And finally, our main public communication channels seem better attuned to the linear and polarised narrative of crisis than to the nuanced, detailed, anticipatory work of crisis avoidance or minimisation.

Quite simply, among other changes[3], we need to find new ways to communicate the kinds of global challenges that elude compression into a simple linear narrative.

News cartography – the creation of dynamic, interactive, collaboratively editable and shareable maps of the stories – is a promising, early-stage response to this challenge. It gives people a way to pull apart an issue like food security or ocean acidification, sift fact from fiction and get to the essence of the debate. It enables everyone to explore a topic at their own speed and find out who is saying what. How much do we know with certainty? How reliable is the information? Who disagrees? What are the solutions?

DebateGraph[4], the website that I co-founded with the former

http://debategraph.org/planet



DebateGraph is a free, web-based tool that is being used in over 100 countries.

Photo: Philip Wade Photography

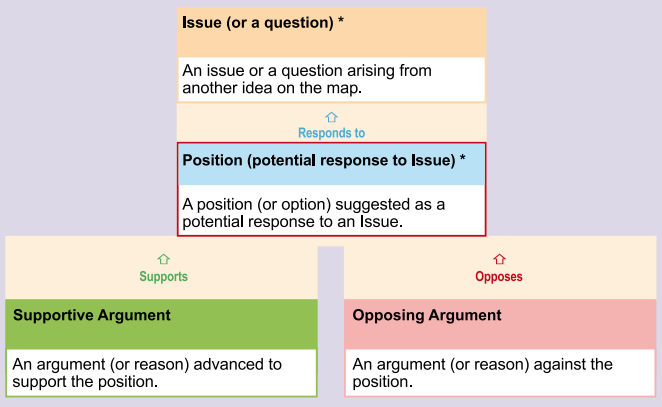


Figure 2: The basic building blocks of a map.

Australian Minister for Higher Education, Peter Baldwin, is one of the pioneers in this new field. We created it as a social-entrepeneurial response to our shared frustration at the limitations of public dialogue on public policy topics.

The free, web-based tool is being used in over 100 countries, and in many different fields, from education, health, strategy, media, publishing, environment, conflict resolution, conferences, and group facilitation to public consultation and planning. Our collaborative partners so far have included: the White House Office of Science and Technology Policy (on open government), the UK Prime Minister's Office (on media policy), CNN (the Amanpour series) and the European Commission (on the governance of Europe's Digital Agenda) – and high-profile public maps have now received over a million views.

The New York Times picked up on our most recent experiment, the Planet Under Pressure DebateGraph, which we are developing with the Earth System Science Partnership (ESSP), IGBP and the Future Earth team, along with a group of doctoral students at the Dutch institute SENSE (Research School for Socio-Economic and Natural Sciences of the Environment)[5].

Planet Under Pressure gathered leading scientists, policymakers, NGOs and businesses to explore how the scientific community can develop and share the knowledge necessary to identify the risks humanity faces in the Anthropocene and respond wisely to the policy choices this presents. This is the ultimate complex, interconnected topic; so it's a perfect test-bed for DebateGraph.

Visual cues identify the ideas with largest support.

The live work-in-progress on the map (Figure 1) is available openly online and you are welcome to join and contribute to the evolving debate[6].

The basic process is simple. DebateGraph creates reasoned pathways through complex problems by: 1) breaking down the subject under discussion into discrete ideas; 2) figuring out the relationships between those ideas; 3) expressing the ideas and relationships visually; and 4) reiterating steps 1-3 to improve the map as the understanding of all the participants develops.

In DebateGraph, ideas are either thought bubbles or boxes, with arrows expressing the relationships between the ideas, and bright colours signalling the types of ideas and relationships. Taken together, the viewer can digest the big picture at a glance.

The general example given in Figure 2 shows the set of core building blocks. An Issue or Question (orange) is raised. A potential response to that issue (or Position) appears in blue. Supportive (green) and Opposing (red) Arguments can appear that articulate the cases for and against Positions. Figure 3 illustrates how these building blocks have been applied in a small strand of the Planet Under Pressure map.

In Figure 3, a mapper has raised an orange Issue relating to the options for responding to the emerging planetary crisis. A blue option in response to the Issue has been proposed (widening the attack on greenhouse gases to include methane), and a green supportive reason has been offered in favour of this proposal – that reducing the methane in the atmosphere will make it easier for forests and land vegetation to absorb more carbon.

While DebateGraph offers a wide palette of idea types and relationships – including causality, consistency and formal logic – the core dialogic triad described above (of Issues, Positions, and Supportive and Opposing Arguments) can be combined multiple times to build large, comprehensive maps.

The structure of the map is augmented with embedded videos, images, charts, tables, detailed text, documents, files, citations and comments. Ideas can be cross-linked to other ideas on the same or different maps. All members of the community can add new ideas and edit and rate existing ideas. Visual cues identify the ideas with largest support. The system can fire off RSS feeds and email alerts to keep everyone up to date as the map evolves.

Collaboratively editable maps of public policy issues of this kind enable everyone within a community to benefit from the thinking of everyone else in the community transparently, efficiently and effectively – and independently of the vested interests of any institution, including the commercial mass media.

The maps bring together all of the salient policy ideas and evidence distributed across a transdisciplinary community into a single, coherent, meaningful structure. Each idea is represented just once and in a form that is continuously and iteratively open to challenge, support and refinement by all members of the community. Large-scale, multi-dimensional maps can evolve from the first simple seed question until the map addresses every salient consideration and perspective.

Once an idea has been represented on the map, there is no need for it to be repeated;

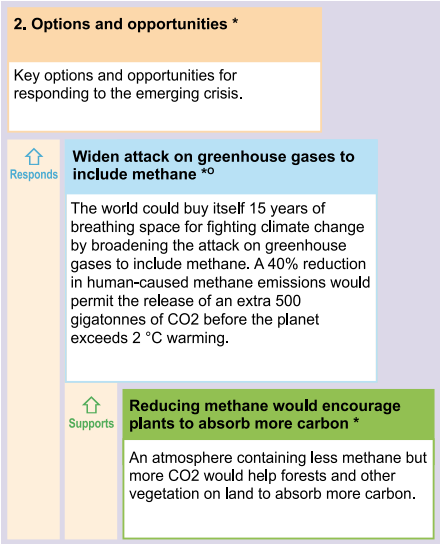


Figure 3: Building blocks as applied to a small strand of the Planet Under Pressure map.

instead the community is free to focus on improving, supporting, challenging and rating the idea.

In this way, collaborative visual mapping offers a powerful method for a globally distributed network of people to think through complex, non-linear and highly interrelated problems in a manner that is: cumulative (of new ideas and evidence); distillative (filtering out repetition, digression, *ad hominem* attacks etc); deliberative (allowing each point and strand of dialogue to be challenged, supported, clarified and evaluated); transparent (allowing everyone to see the underlying reasoning, and building participant and observer trust); multi-layered (connecting local issues to the regional to the national and the supranational and vice versa); and, always open to new participants and to new ideas, so that, as with science, the dialogue and understanding it generates become more rigorous as it evolves.

Externalising and structuring thought in this iterative form augments individual and group ability to think through complex issues. It helps the participants and readers to overcome the cognitive constraints of short-term memory and sub-optimal group processes such as groupthink and homophily. And it can do so in an often playful, creative and engaging way.

Just as a mediator seeks to create a physical space in which conflict can be explored and resolved, the interactive maps provide a networked context in which the conflicting values and interests of multiple stakeholders can be surfaced and addressed openly and in an explicitly reasoned way.

Sharing collective understanding in this structured and transparent form also helps each participant to see that his or her perspective has been heard and represented accurately in the appropriate context, which helps to build trust in the form and process of communication and ensure that the maps evolve towards a full and fair reflection of the subject under consideration.

Moreover, documenting the reasoning behind a community's thinking and decision-making helps to bring greater clarity and accountability to the community's analysis, choices and actions, and makes it easier for the community to learn from mistakes and improve its decision-making over time.

In principle, collaborative argument visualisation of this kind has the potential to enable a new kind of democratic public deliberation across existing disciplinary and institutional boundaries on a global scale – and, in due course, for that deliberation to enhance and guide the global policy governance process.

For now the technology and the Planet Under Pressure map remain in the early stages of development. We welcome help and feedback to push the technology and the map to their full potential, and to learn more about the social challenges of integrating an unconventional method into the core of the international policy-making dialogue.

The interactive maps provide a networked context.

The immediate next step for the Planet Under Pressure map is to keep refining and expanding the content to cover the outputs from Rio+20 and the Rio Dialogues, a process that all are welcome to join. In parallel with this, the project team will be presenting the map at conferences and symposia across the next 12 months.

If you are interested in learning more about the Planet Under Pressure mapping project, or embedding the map on your own blog or website, or if you would like to suggest other material to include in the map, do contact me and join the debate!

DAVID PRICE is the co-founder of DebateGraph and leads its consultancy, mapping and training projects. He lives in Somerset, UK.
E-mail: david@debategraph.org

REFERENCES AND NOTES

1. Brito L and Stafford Smith M (2012) *State of the Planet Declaration*. Planet Under Pressure, London, 26-29 March, 2012.

2. Sutherland W J *et al.* (2012) *PLoS ONE* 7(3): e31824, doi:10.1371/journal.pone.0031824.

3. Other promising developments, for example, include the emergence of the open science movement, the Rio Dialogues, and – building on the scientific advances of the GEC research programmes (IGBP, DIVERSITAS, IHDP and WCRP) and the ESSP – the transdisciplinary co-commitment of the Future Earth initiative.

4. http://debategraph.org

5. http://www.sense.nl

6. http://debategraph.org/planet