



Measuring and modelling social license: Taking the heat out of renewable energy

Scott Condie

We extend our deepest respect and recognition to the Muwinina people as the Traditional Owners of the land where we work and to all Traditional Owners across lutrawita (Tasmania) where this research has been undertaken.





Corrine Condie



Scott Spillias



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Scott Condie



Matt Andreotta

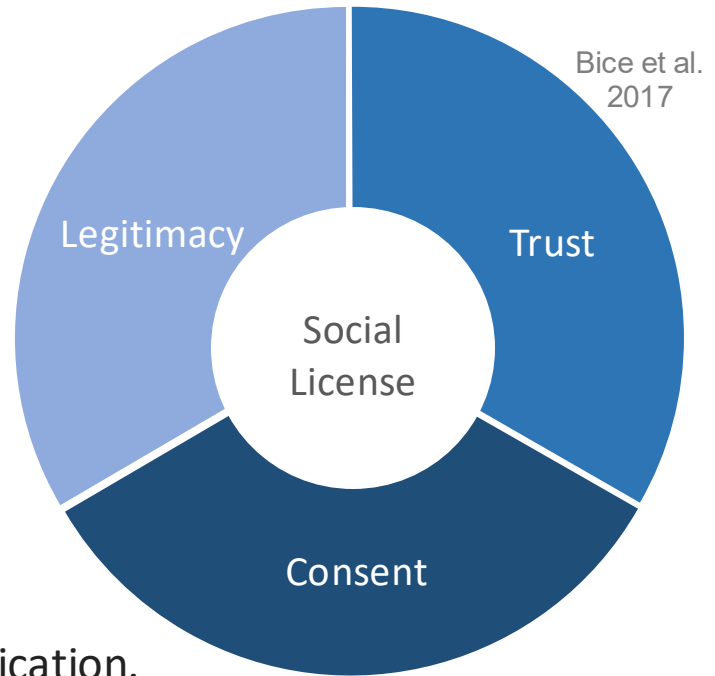


Social License to Operate (SLO) refers to the ongoing acceptance and approval of an industry's operations by local communities and other stakeholders.

Distinct from approvals by government or certification.

Not directly based on agreed regulations or standards.

Cannot be obtained or maintained by assertion.



Diverse perspectives on SLO:

SLO will always remain too difficult to measure (Owen and Kemp, 2012) and therefore continue to be used opportunistically by all sides of the debate (Bice and Moffat 2014).

OR

SLO can be systematically measured by conducting large-scale surveys of community attitudes (Moffat and Zhang, 2014) and will ultimately provide a key performance indicator to underpin the quality of stakeholder relations in the future (Lacey et al. 2012) and associated social risks.



High conflict space:
traditional engagement
approaches are often ineffective





my office

proposed stadium

Unbiased data



Informative analyses



Dynamic models

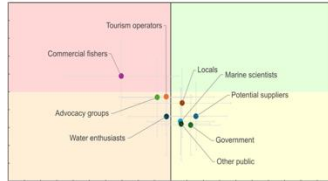


Tested strategies

Stakeholder surveys



Broadcast media



Stakeholder analysis



$$O_{i,t+1} = \sum_{j \in J_t} w_{ijt} O_{j,t} + \sum_{k \in K_t} v_{ik,t} \tilde{O}_{k,t}$$

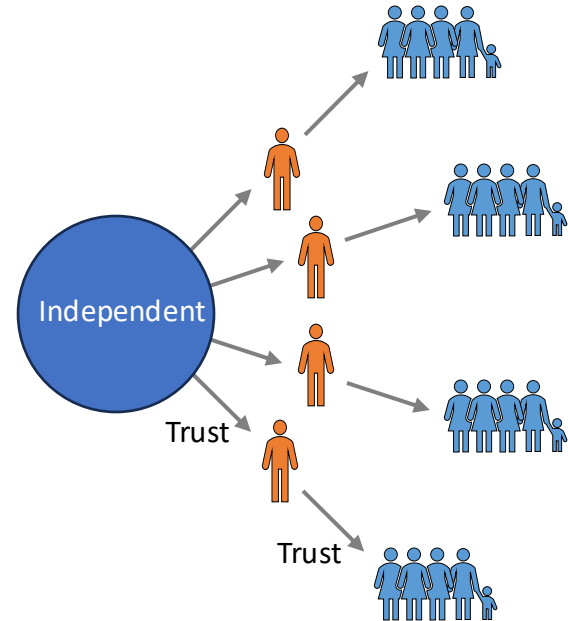
$$w_{ijt} = \begin{cases} \frac{1}{|J_t|} & \text{if } C_{i,t} \leq \frac{1}{|J_t|} \sum_{j \in J_t} C_{j,t} \\ 0 & \text{if } C_{i,t} > \frac{1}{|J_t|} \sum_{j \in J_t} C_{j,t} \end{cases}$$





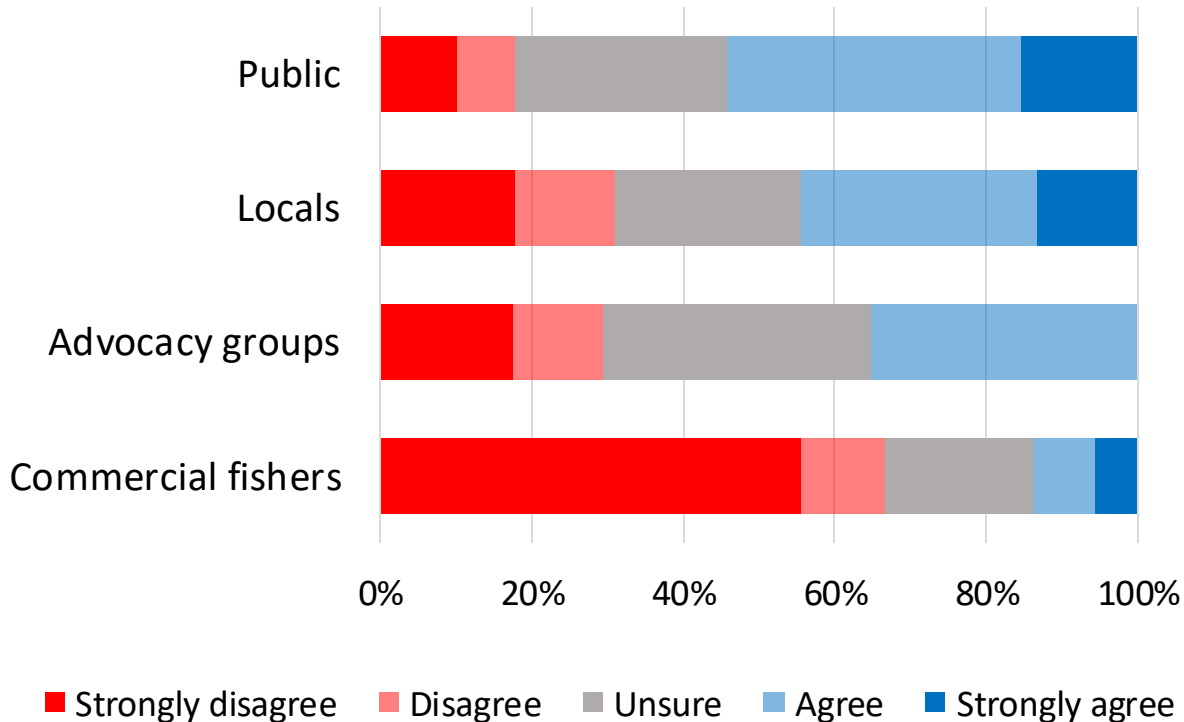
Stakeholder surveys

- Capturing views on contentious issues requires trust in the survey process.
- Conducted by an independent entity with neutral objectives (e.g. reduce conflict).
- Utilising community networks built on trusted links between individuals to achieve a stratified purposive sample.
- Paper-based to avoid gaming online surveys.



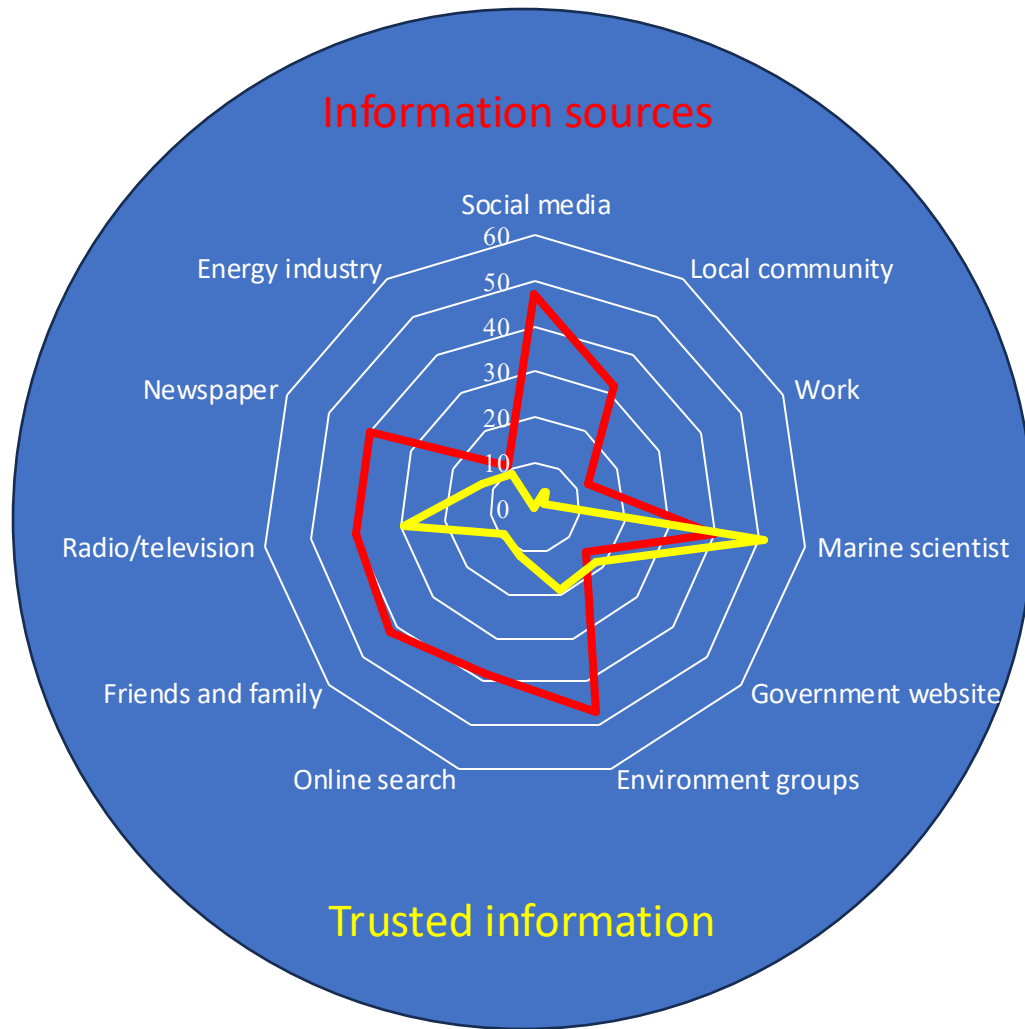


Tasmanian support for offshore wind in 2025





Information on offshore wind





AI-based media analysis



Social media has limitations:

- Emphasises extreme views
- Uses limited by ethics

Unbiased
data



Informative
analysis



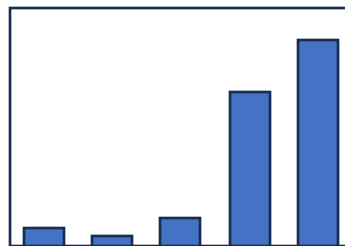
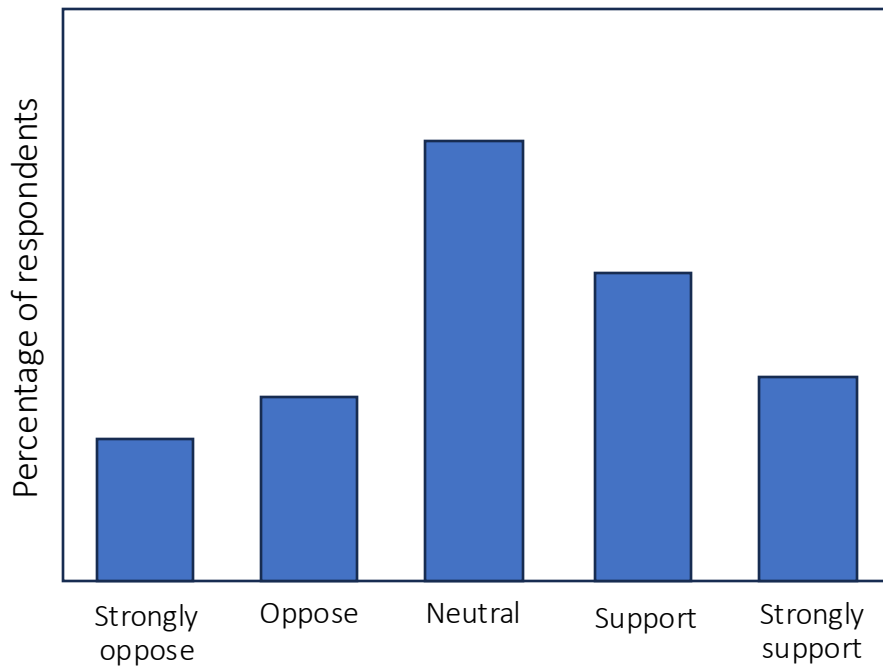
Dynamic
models



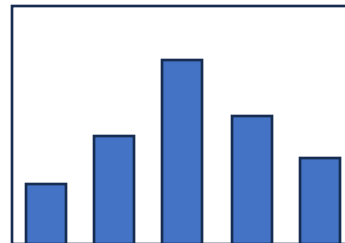
Tested
strategies



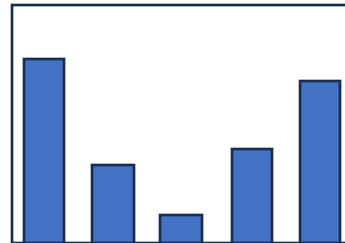
Analysis of attitudes



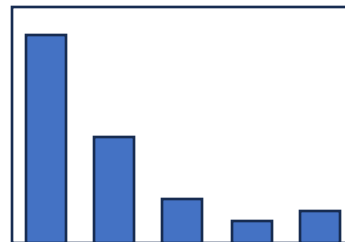
Broadly supported



Uncertain



Polarised

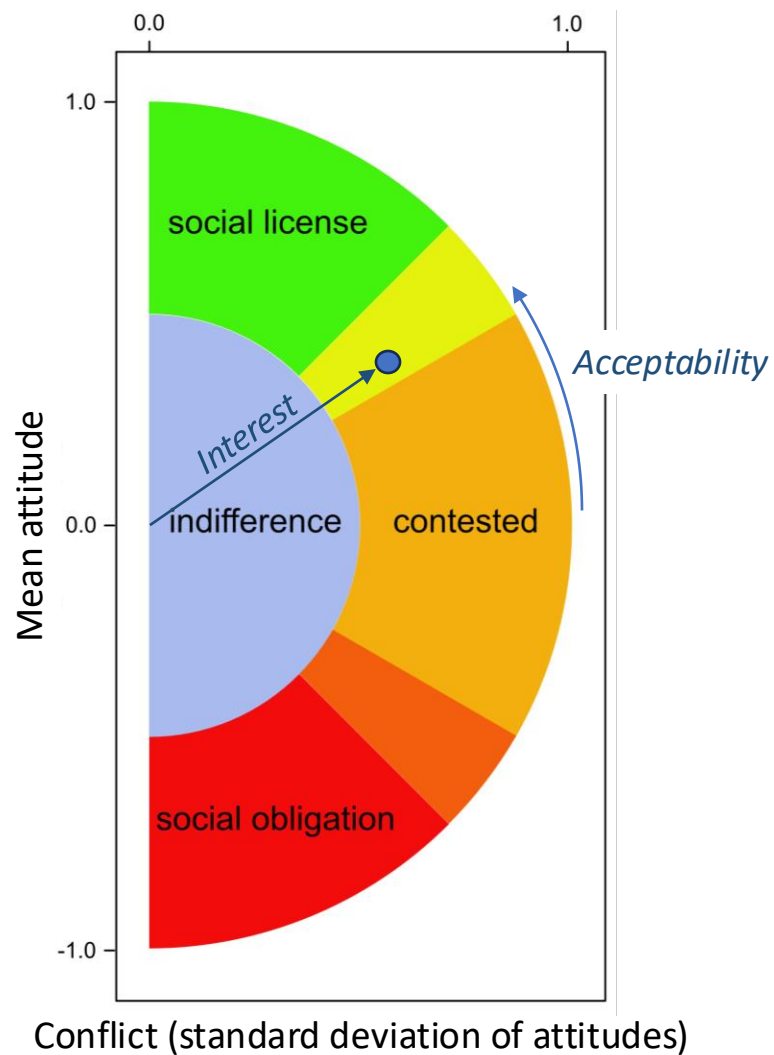
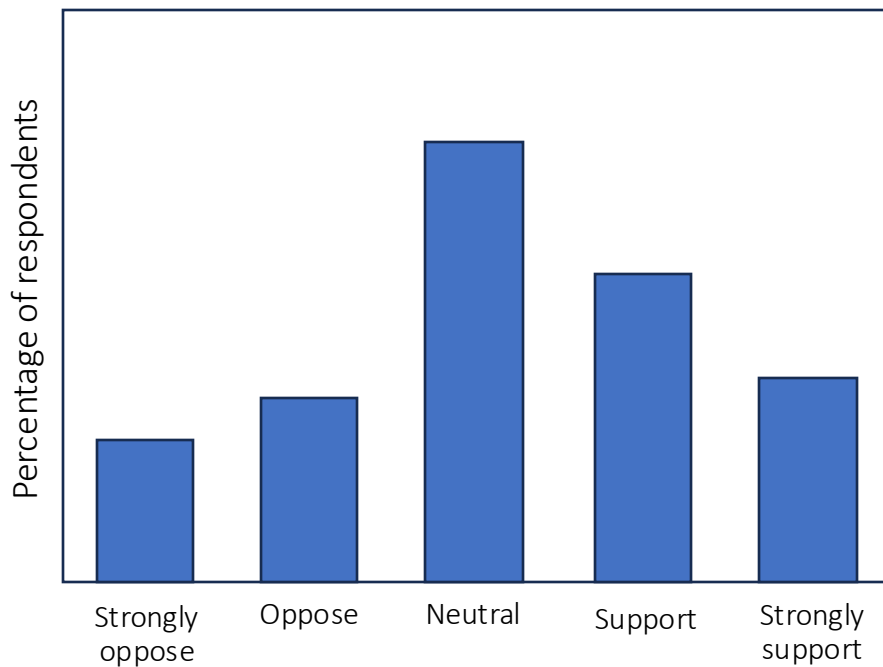


Broadly opposed





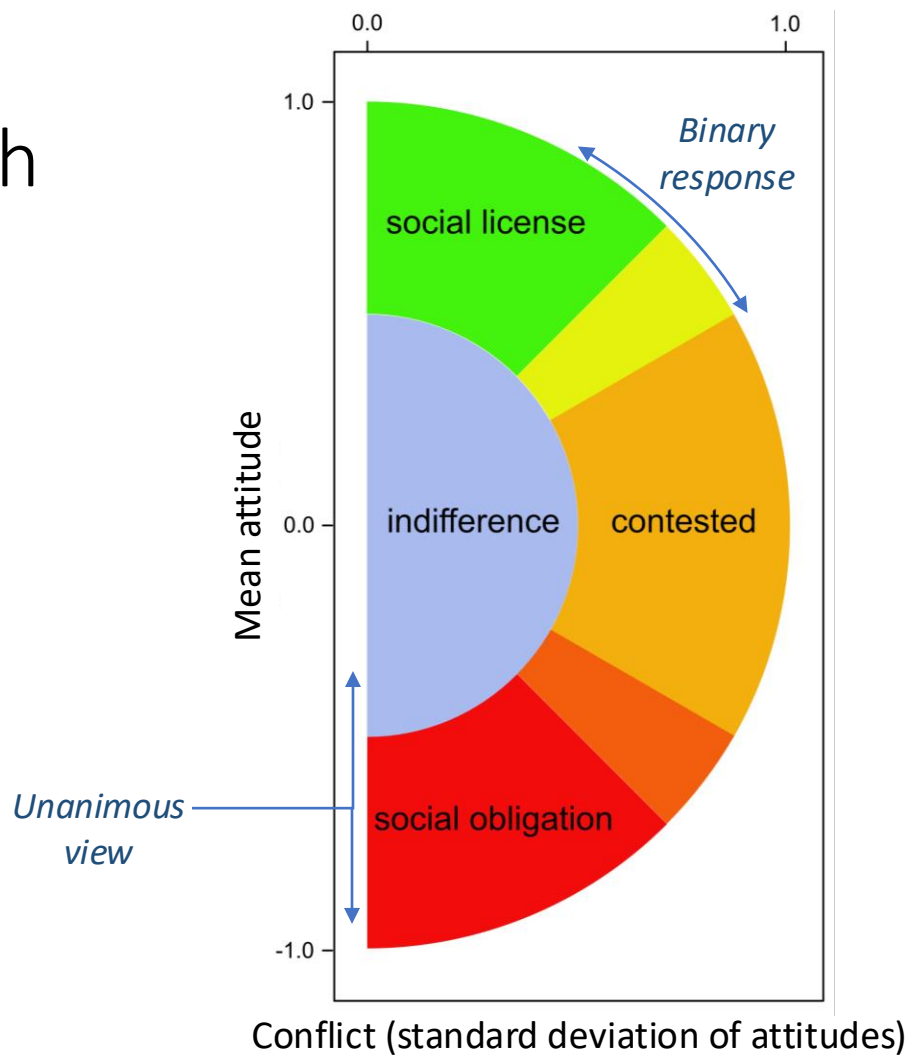
Social license graph



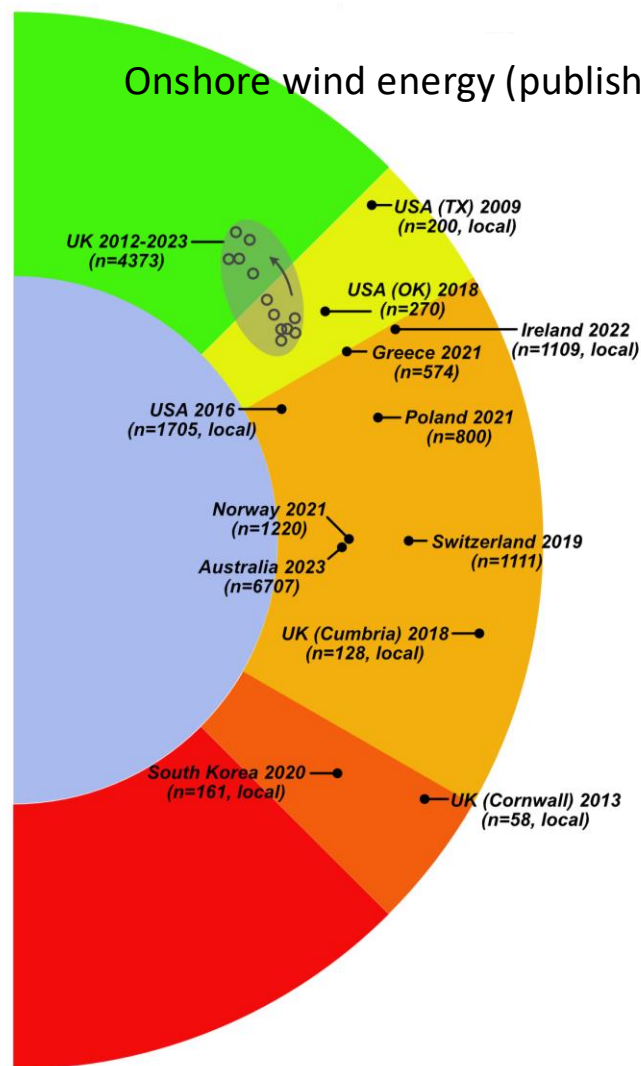


Social license graph

Transitions should be agreed
across stakeholder groups

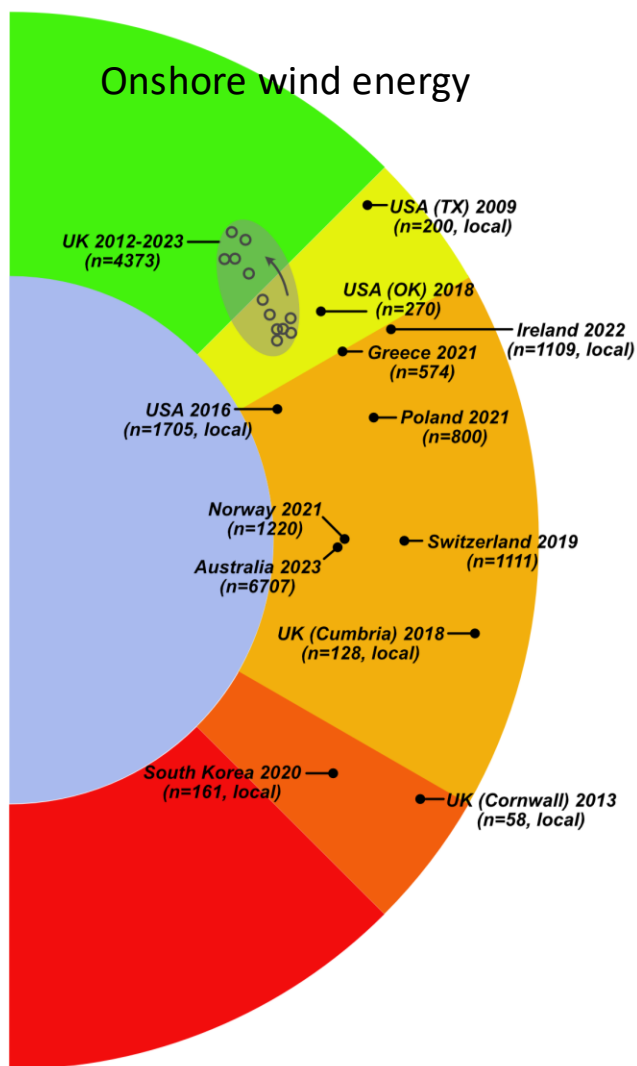


Onshore wind energy (published data)

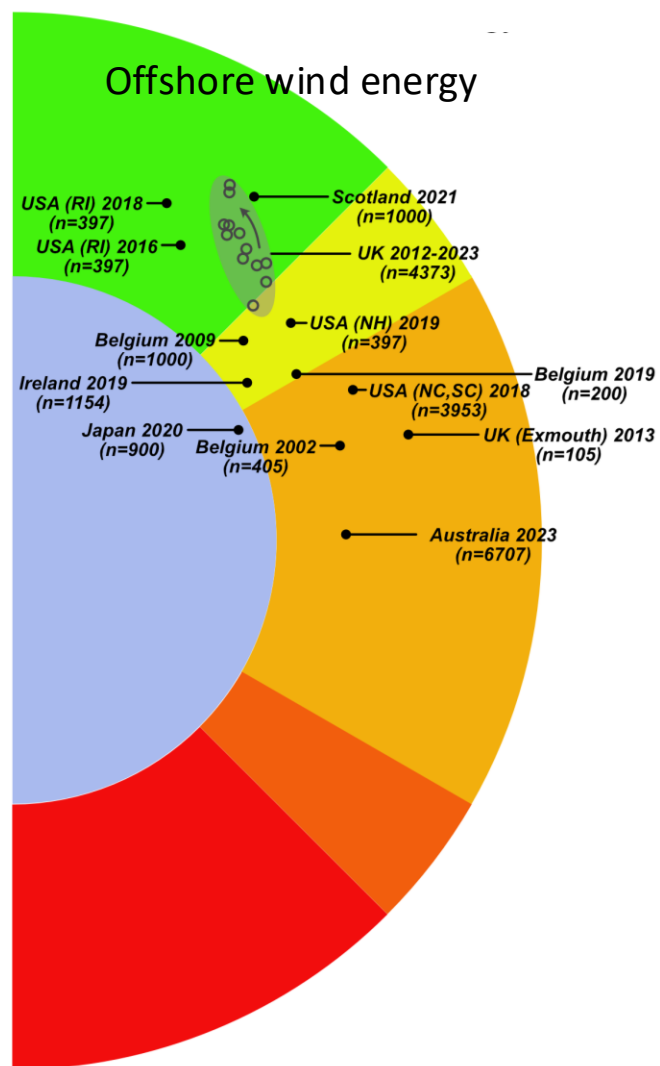


- Local attitudes depend on how a community self-identifies.
- No consistent NIMBY effect.
- Opposition to wind energy tends to dissipate over the development cycle (planning > construction > operation)

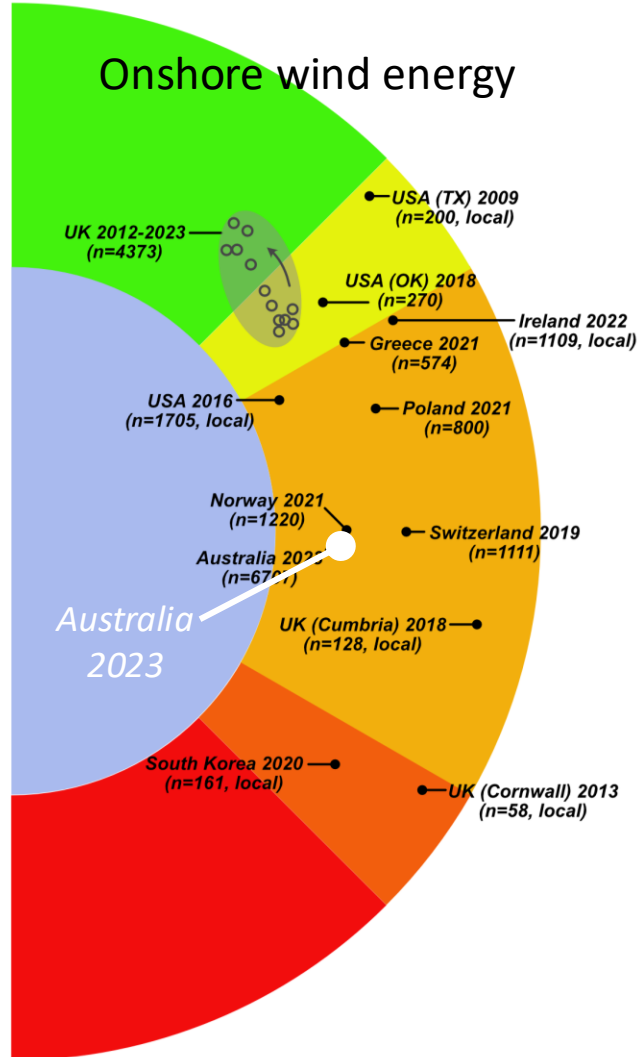
Onshore wind energy



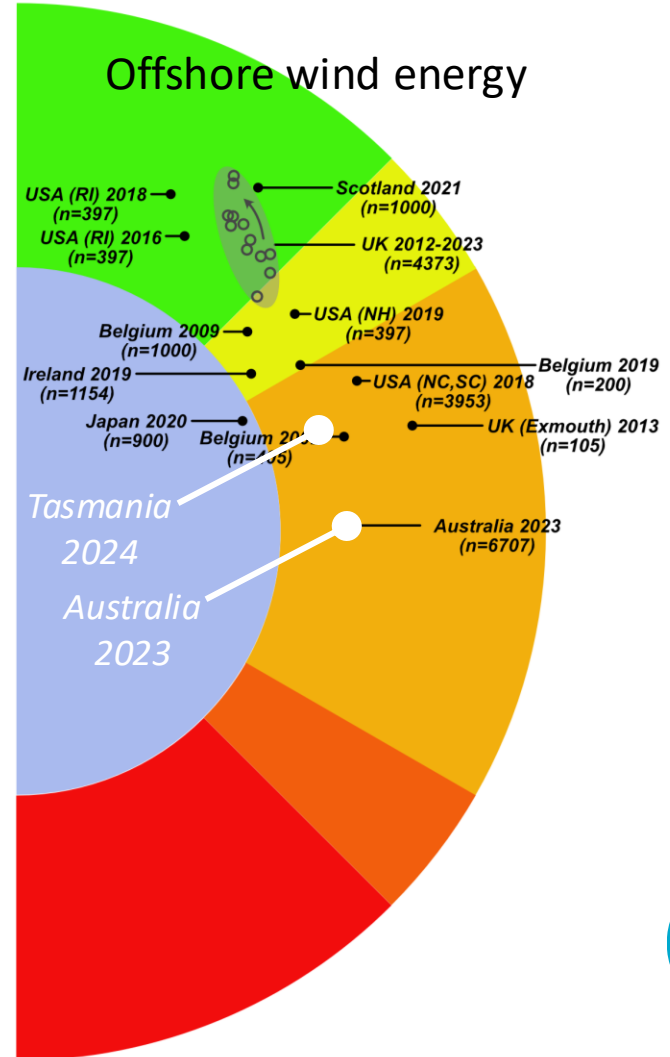
Offshore wind energy



Onshore wind energy

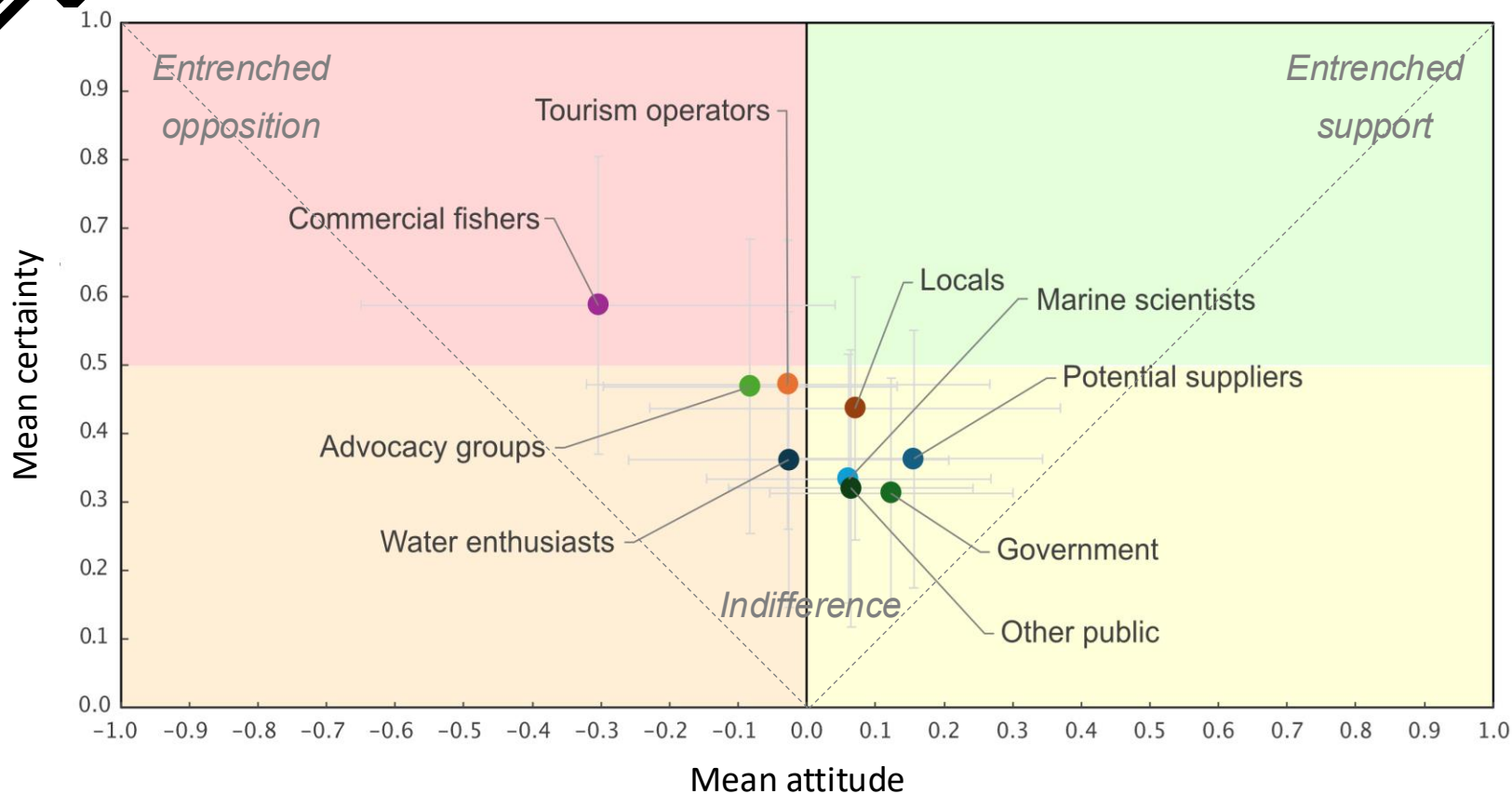


Offshore wind energy



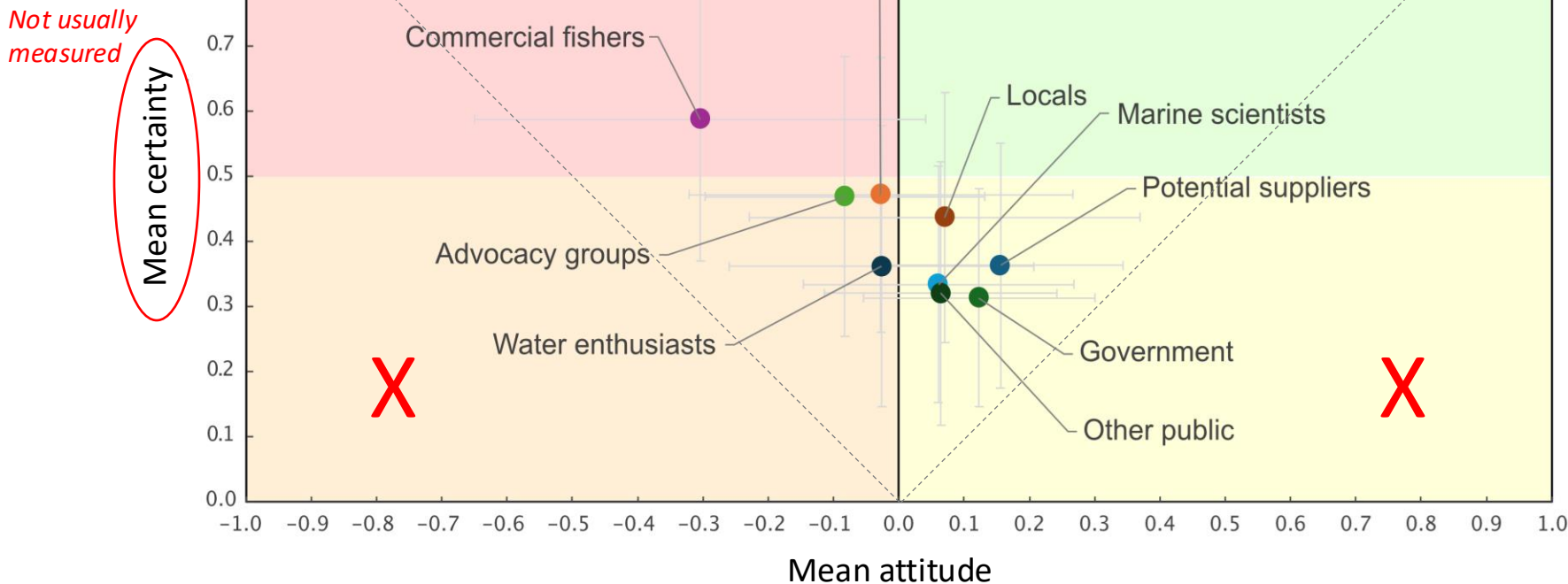


Offshore wind stakeholders: Stakeholder Conflict Grid





Offshore wind stakeholders: Stakeholder Conflict Grid



Unbiased
data



Informative
analysis



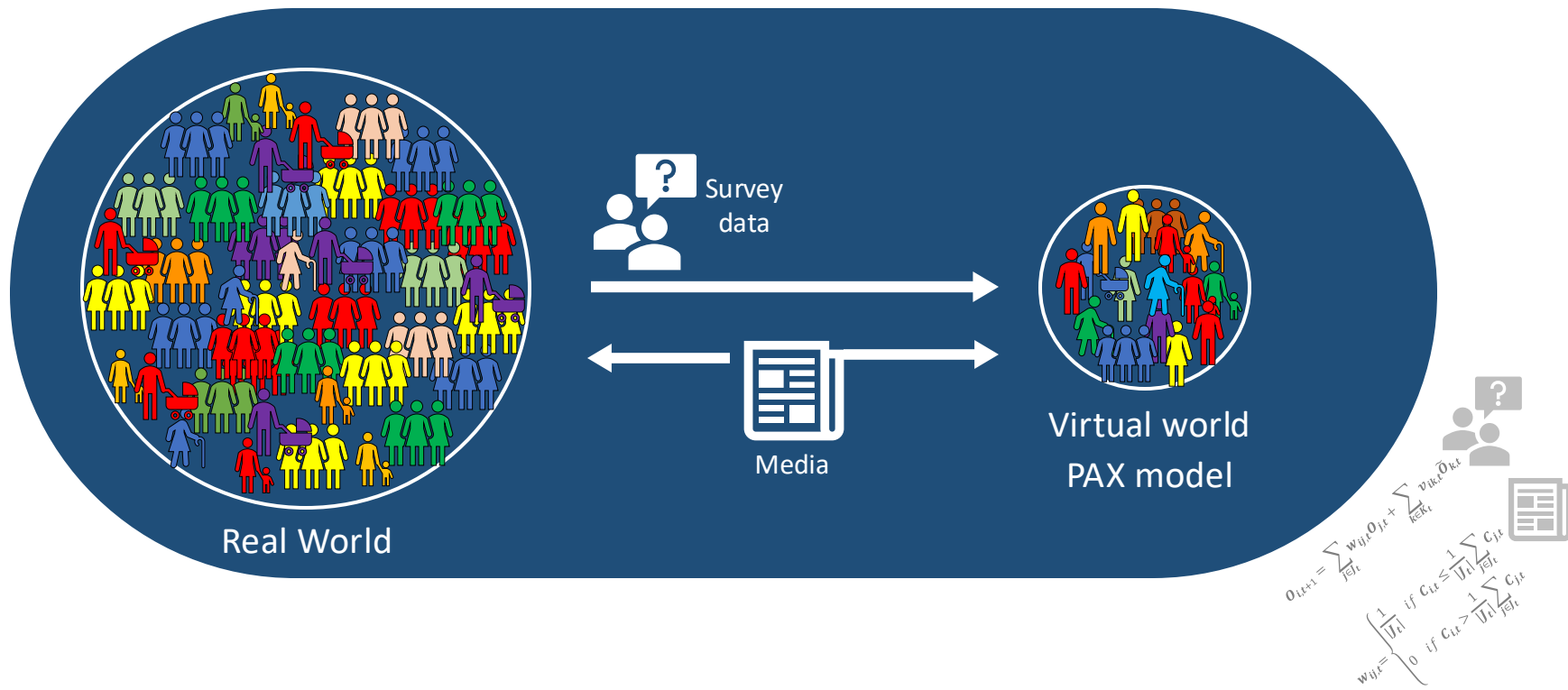
Dynamic
models



Tested
strategies



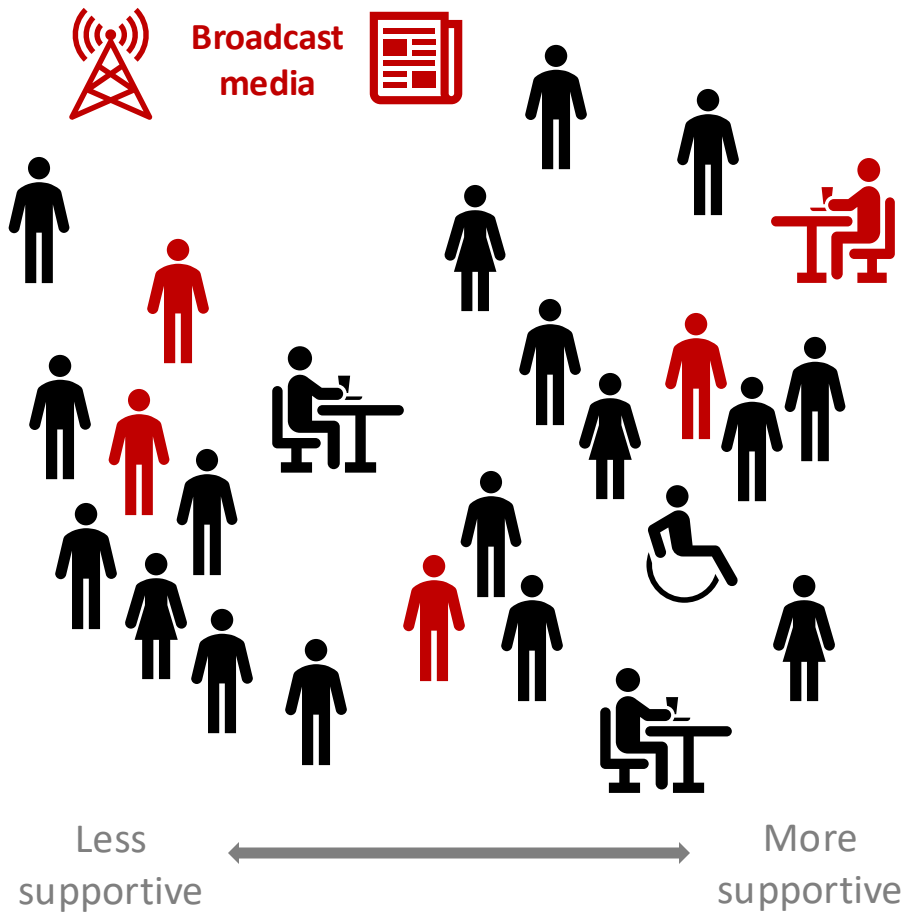
PAX model (Peoples Attitudes eXplained)





PAX model

Network of individuals
exchanging views and
consuming media
(monthly timestep)

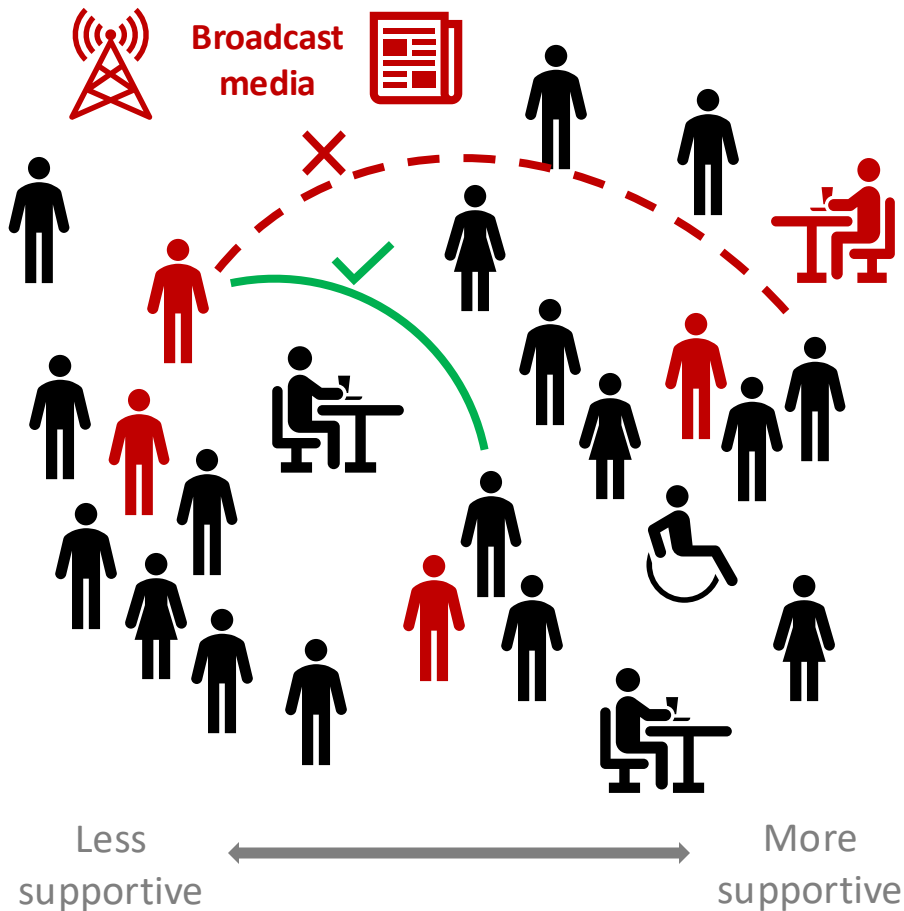




PAX model

Key assumptions:

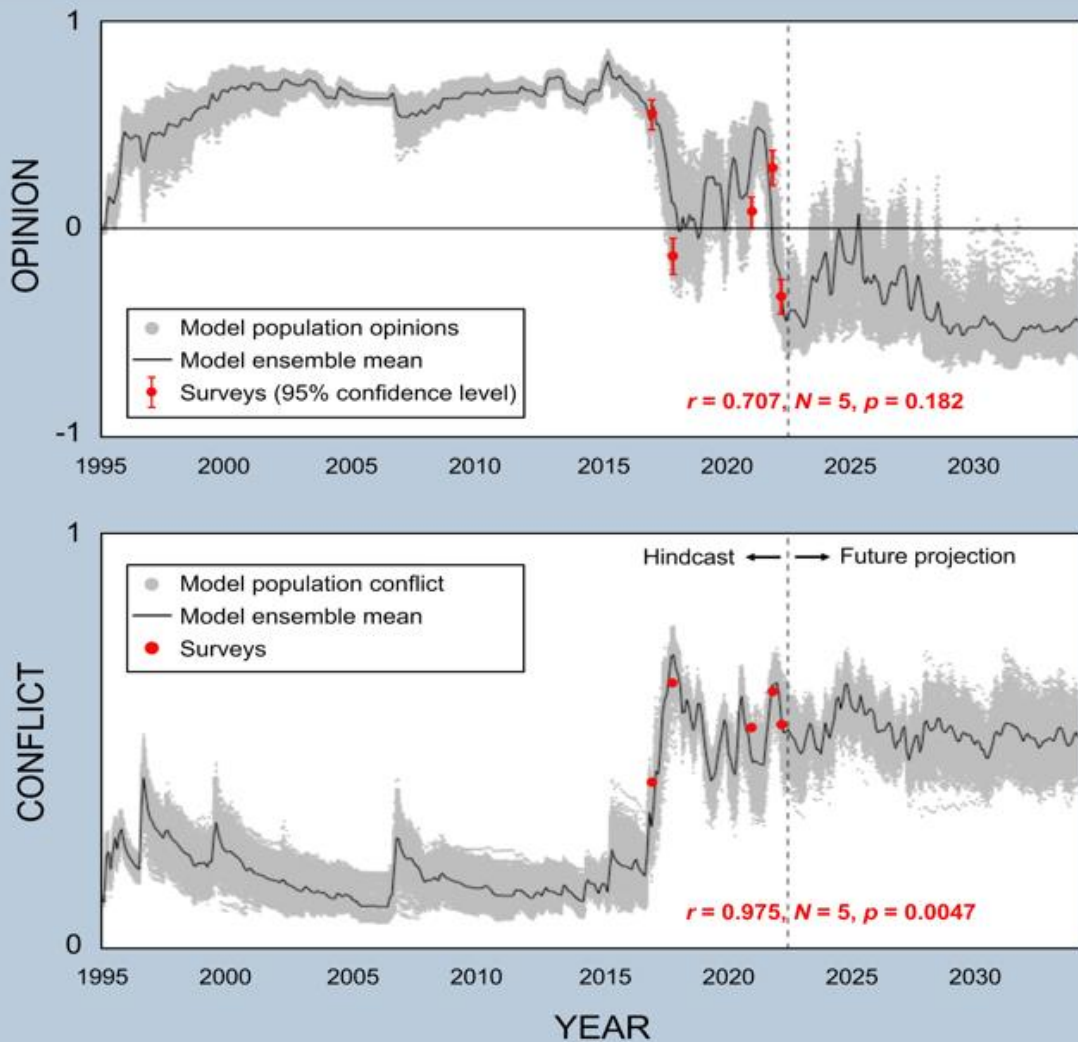
- Some individual are more influential than others.
- Individuals with vastly different opinions rarely influence each other (echo chambers)



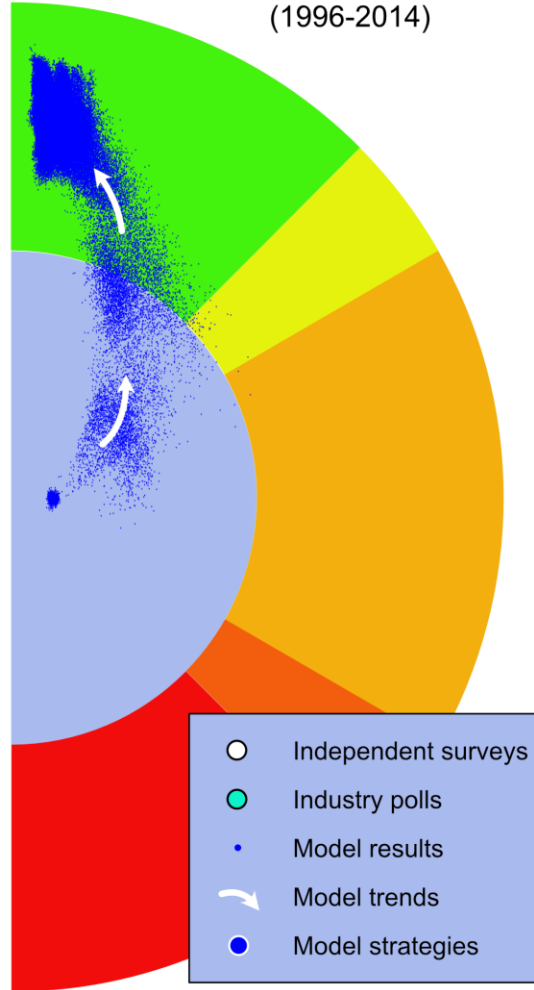


PAX model

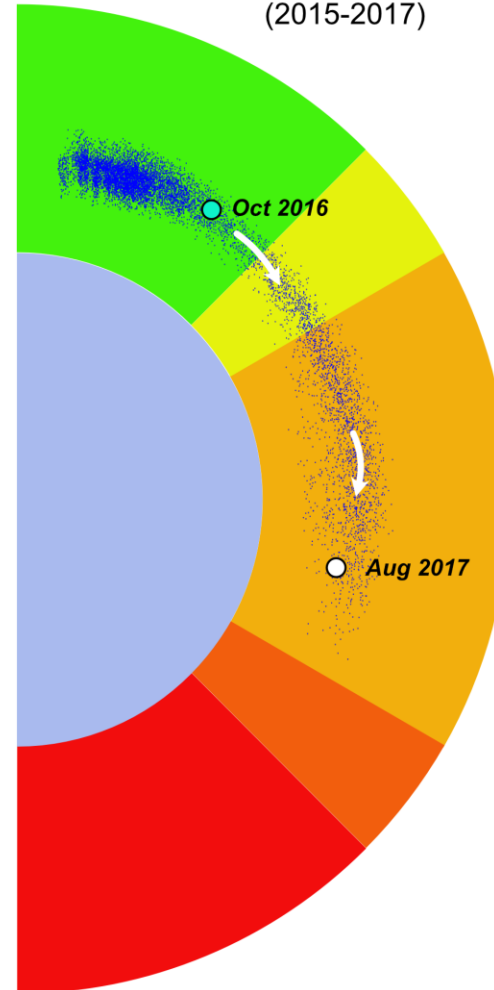
Example of a tipping point
in community attitudes



(a) Community support through establishment phase (1996-2014)



(b) Community support through first tipping point (2015-2017)



Unbiased
data



Informative
analysis

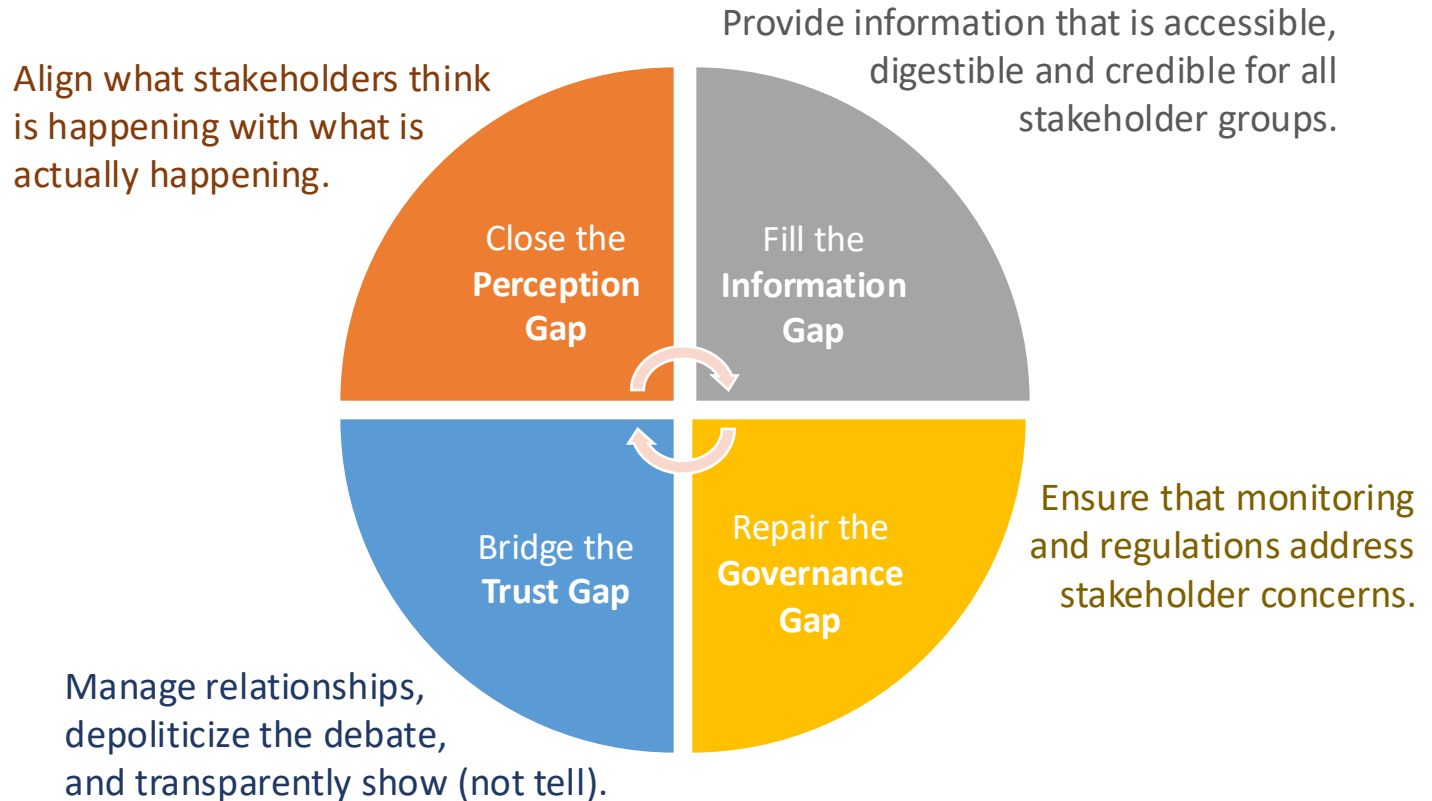


Dynamic
models



Tested
strategies

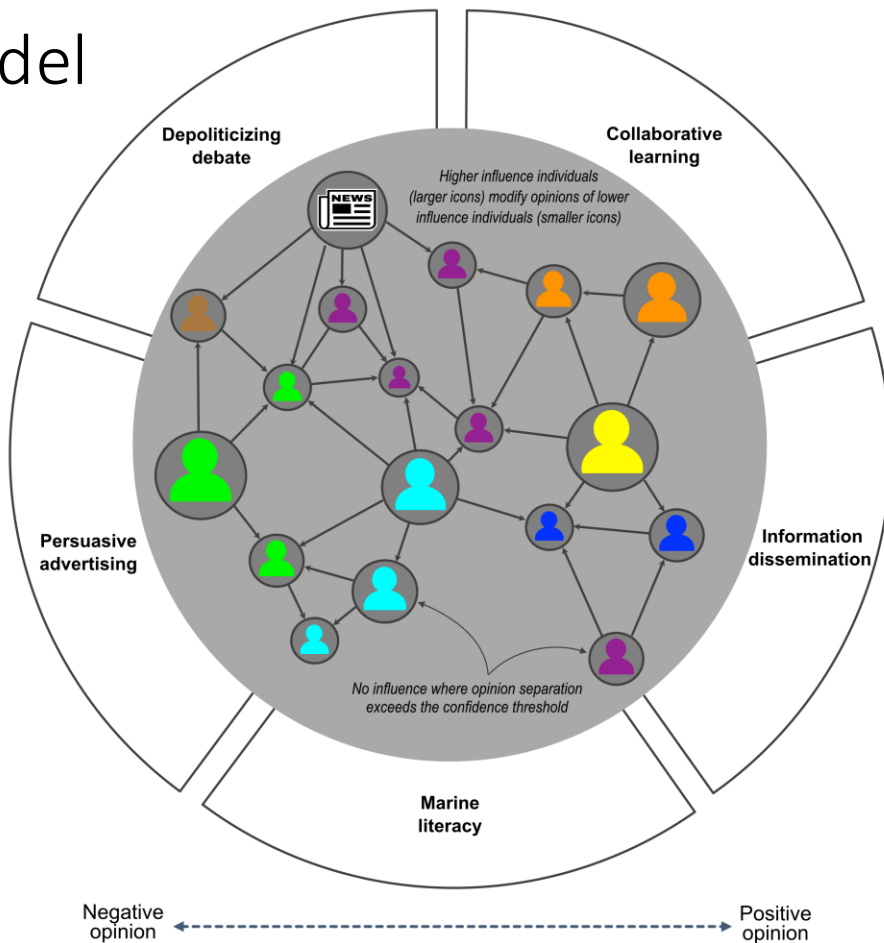
Strategies for a low conflict pathway





PAX model

Evaluating
strategies

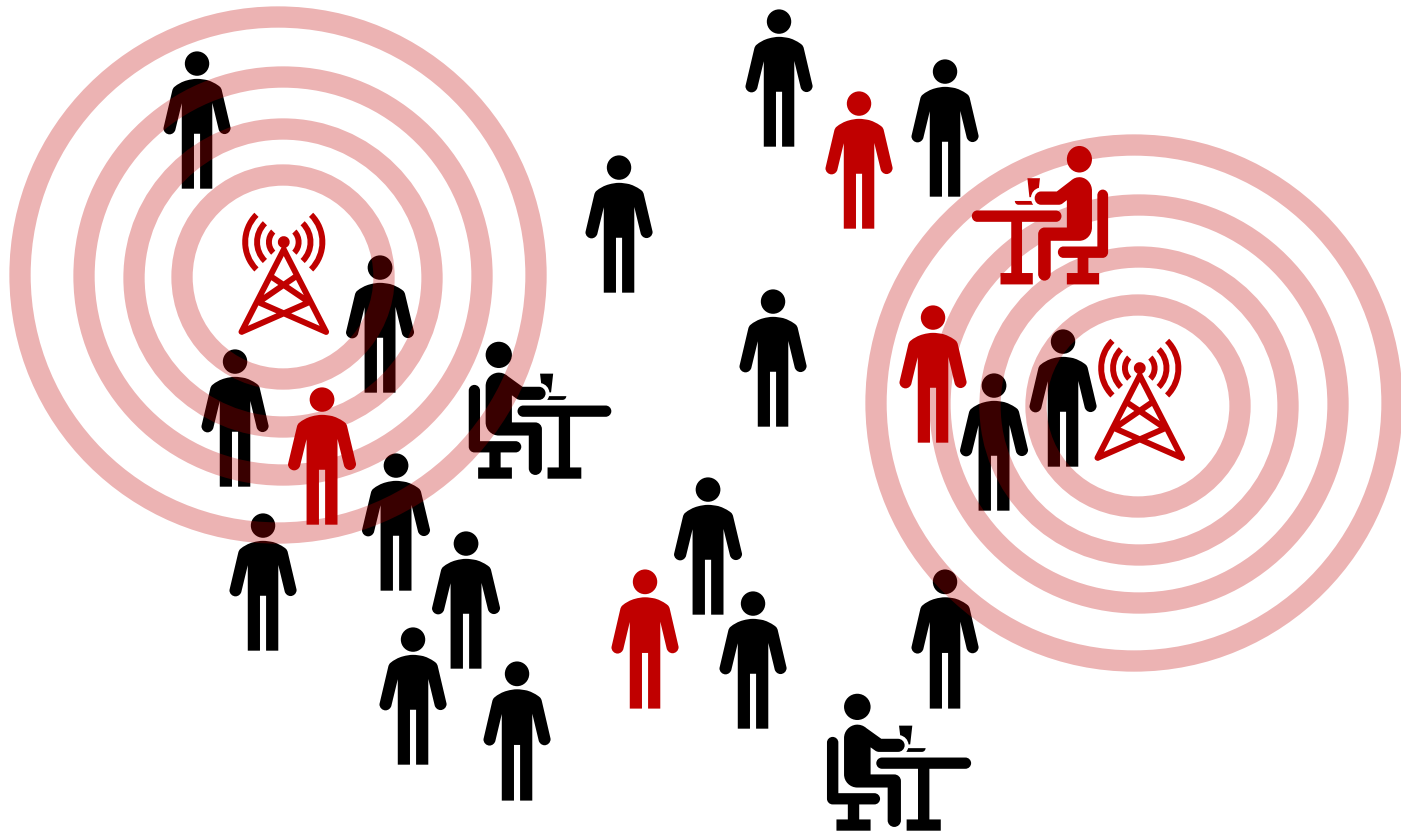


Persuasive
advertising

 Highly
influential
individuals

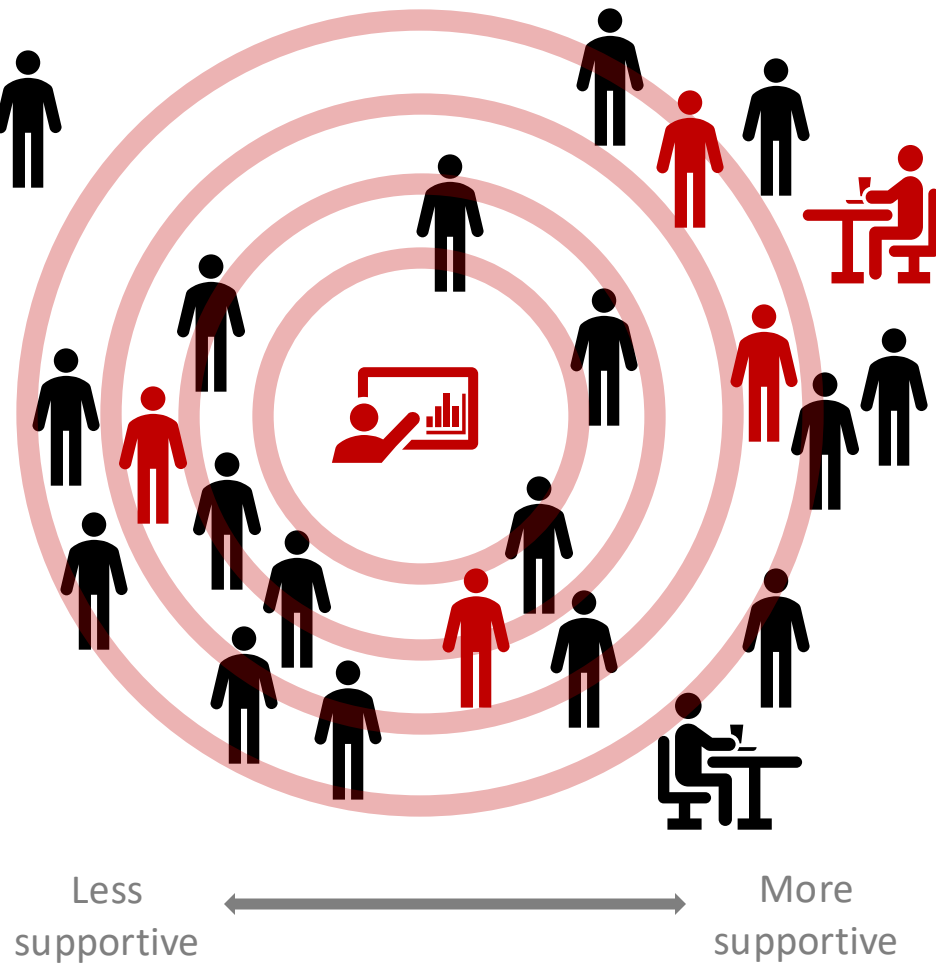
Less
supportive

More
supportive



Marine
literacy

 Highly
influential
individuals

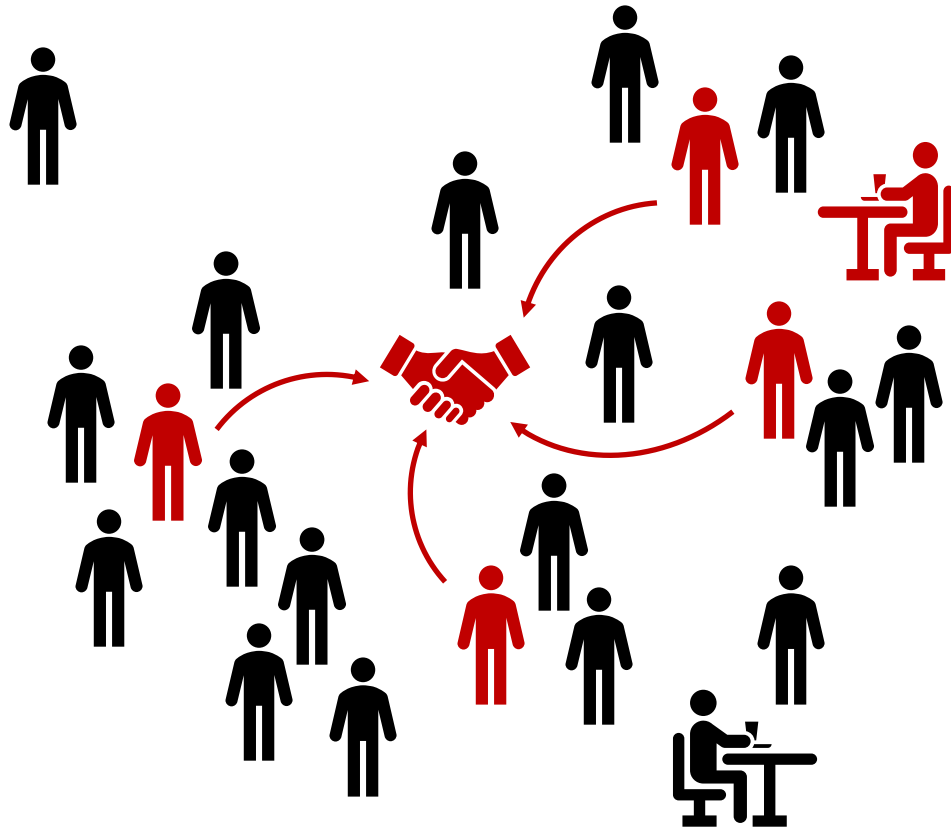


Collaborative
learning

 Highly
influential
individuals

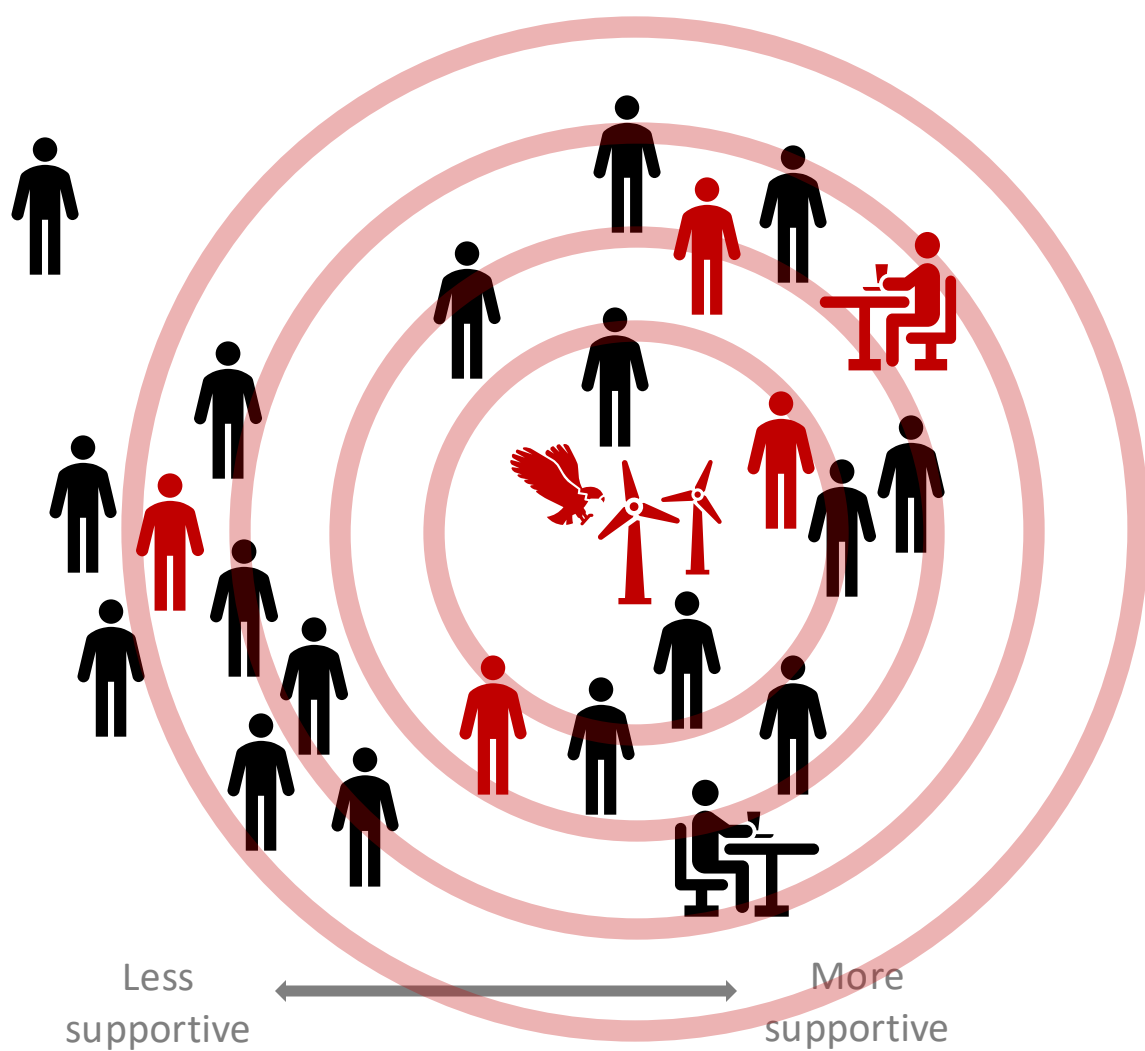
Less
supportive

More
supportive

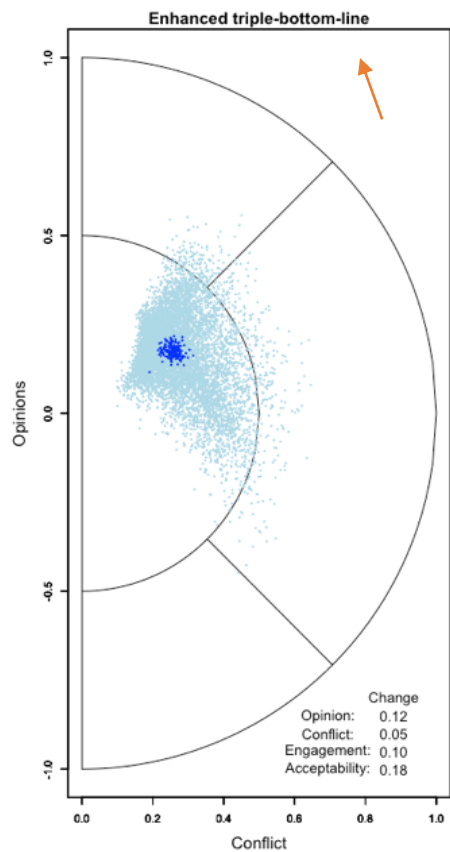
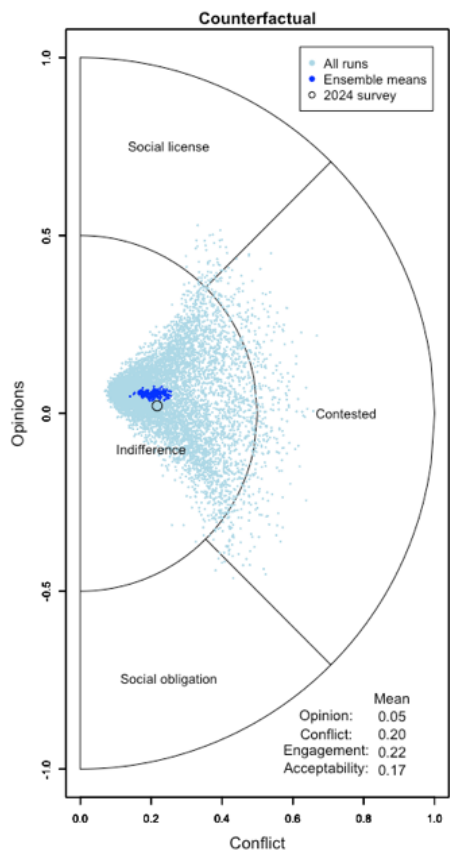


Reforms:
economic,
governance,
environmental

 Highly
influential
individuals

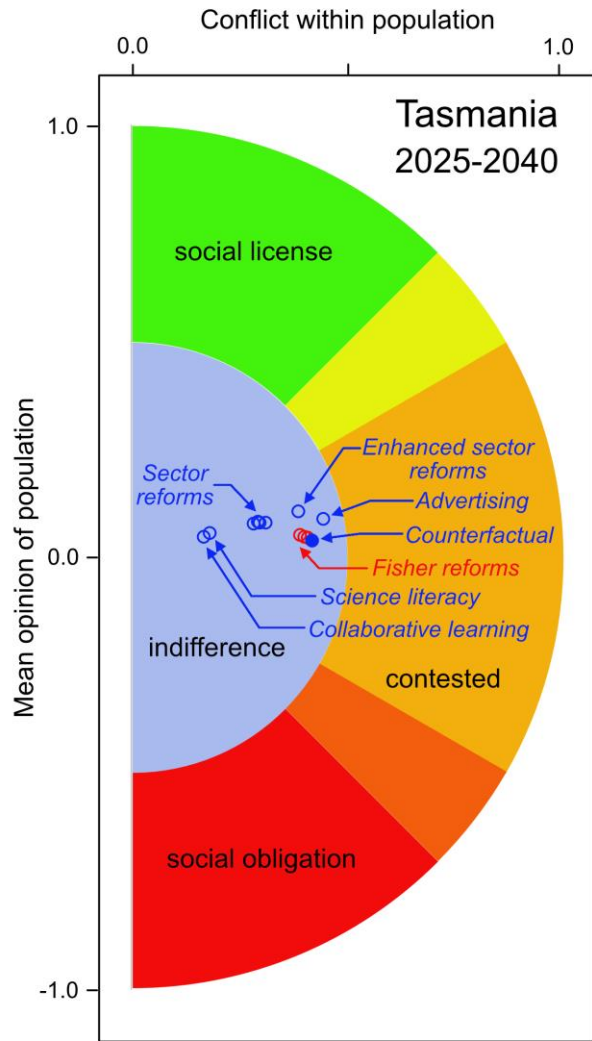


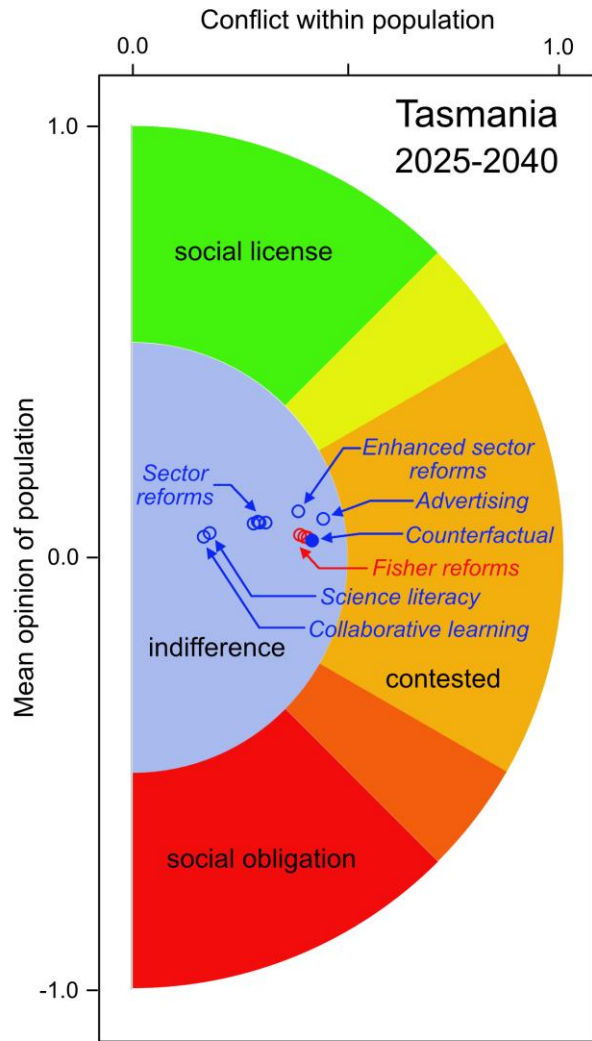
Tasmanian ensemble results 2025-2040

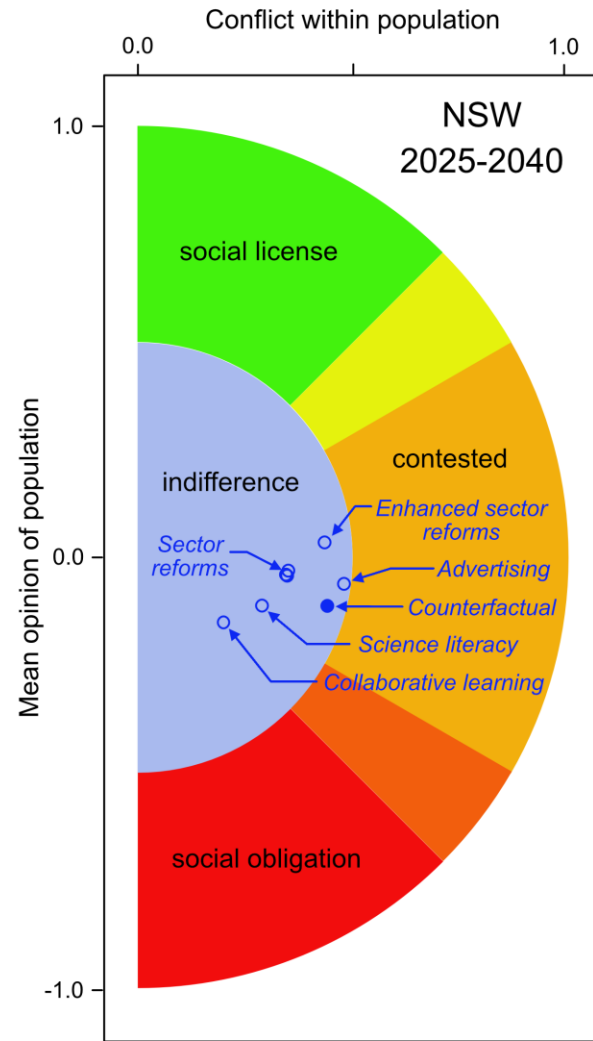
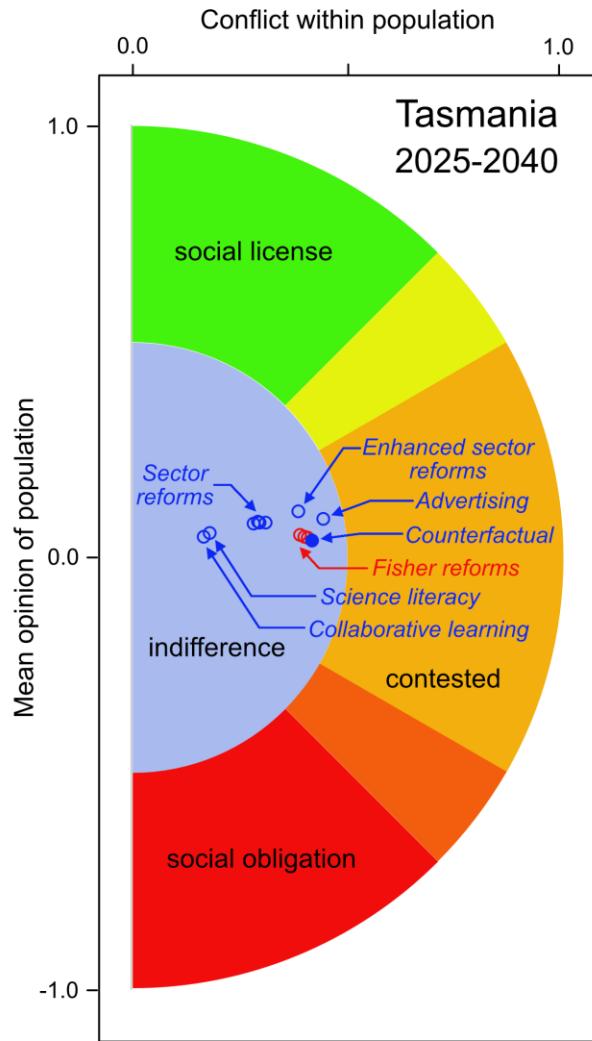


Monthly values from 50-run ensemble (12 x 50 per year)

Monthly ensemble-median (12 per year)



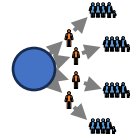






Take-home: new methods and tools

- Surveys need to be broad-based, unbiased, differentiate stakeholders, and include certainty.
- The Social License Graph (SLG) communicates the status of community support over time (using standard attitudinal data).
- The Stakeholder Conflict Grid (SCG) provides insight into the contrasting views of stakeholders and associated social risks.
- Network modelling (PAX) provides a window on potential future directions of the debate and strategies to moderate conflict.

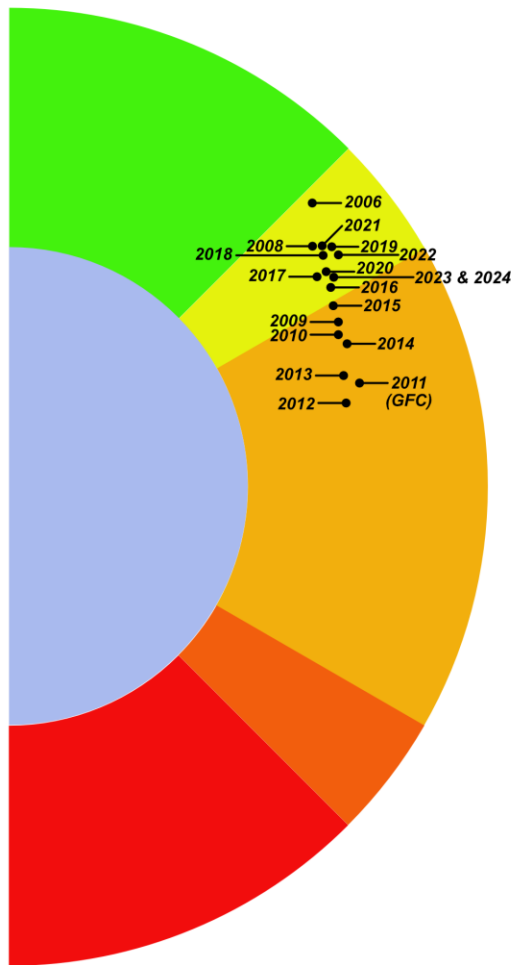




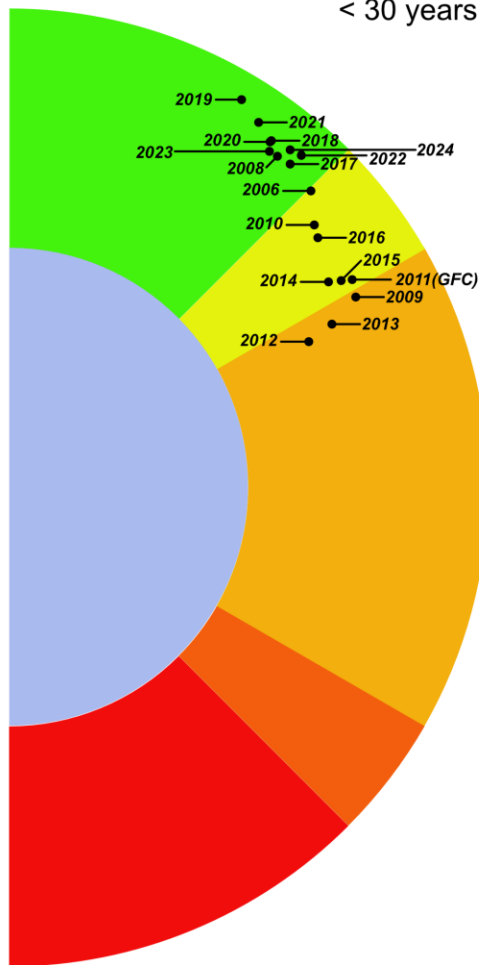
Take-home: general lessons

- Independent well-designed surveys often reveal a large uncertain population, while media and politics focus on extremes.
- Social media is pervasive but untrusted.
- Persuasive advertising can increase conflict.
- Collaborative learning and science literacy reduce conflict.
- Triple-bottom-line reforms also needed to move towards social license.
- Depoliticization can reduce conflict by allowing government to be seen as an independent regulator and not as an industry advocate (challenge where renewable energy is integral to government policy).

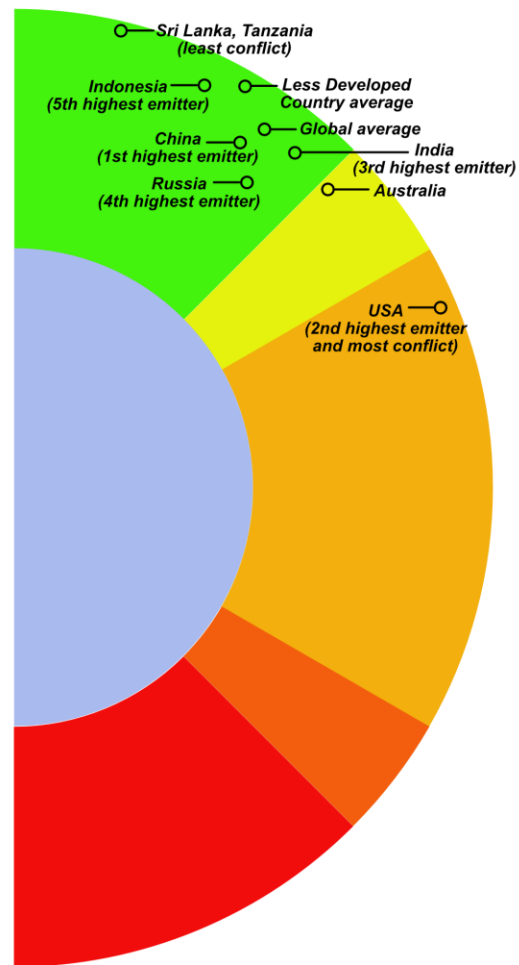
(a) Support for increased climate action within the Australian population



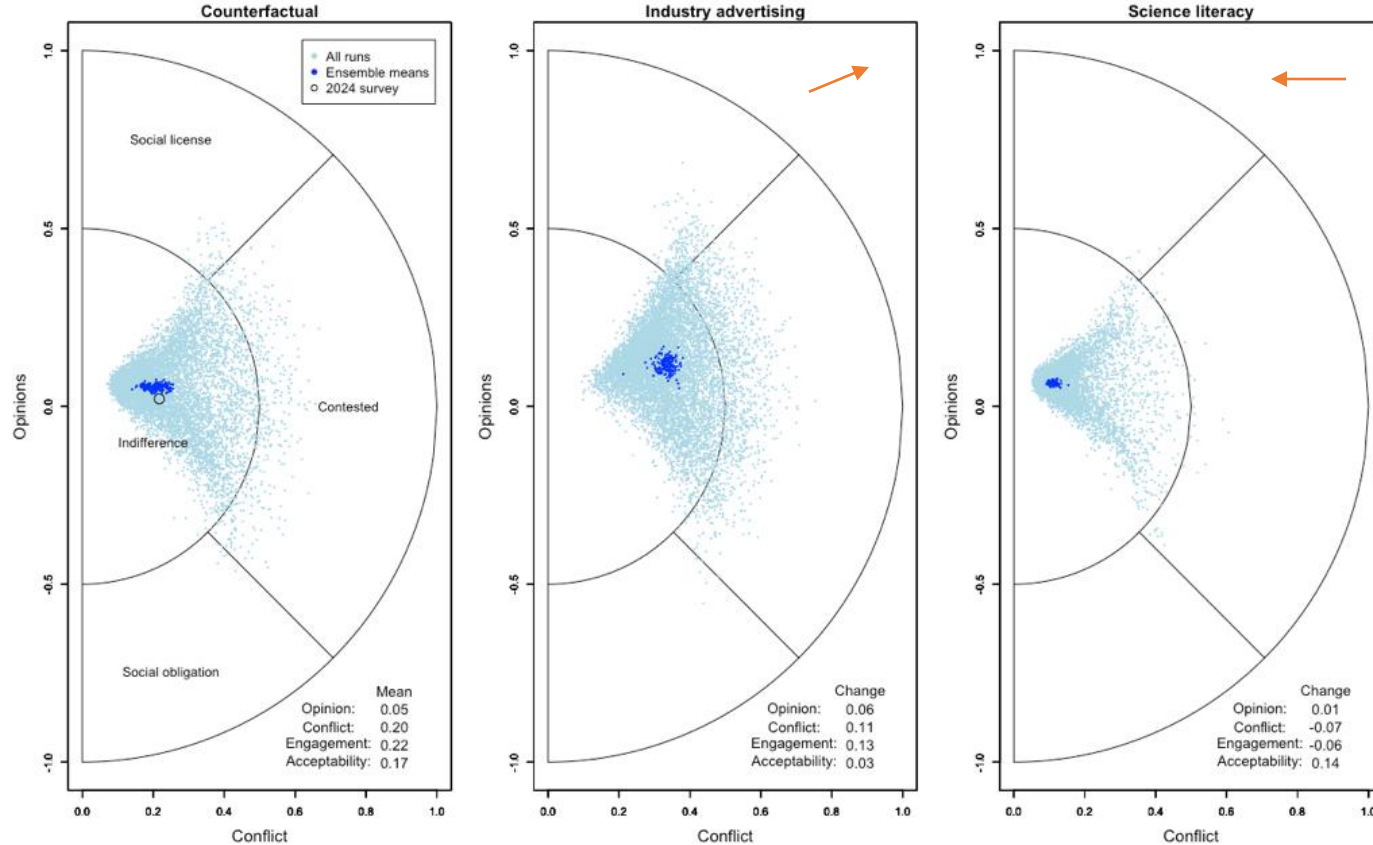
(b) Support for increased climate action within the Australian population < 30 years old



(c) Support for increased climate action internationally in 2024



Tasmanian ensemble results 2025-2040



Monthly values from 50-run ensemble (12 x 50 per year)

Monthly ensemble-median (12 per year)