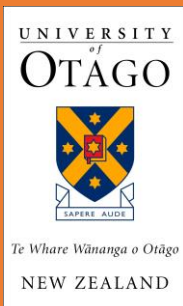


A stylized sun graphic consisting of a large yellow circle with several shorter yellow dashes of varying lengths radiating from its top-left edge, set against an orange background.

Exploring Expectations for Green Hydrogen in New Zealand using an Energy Cultures Framework

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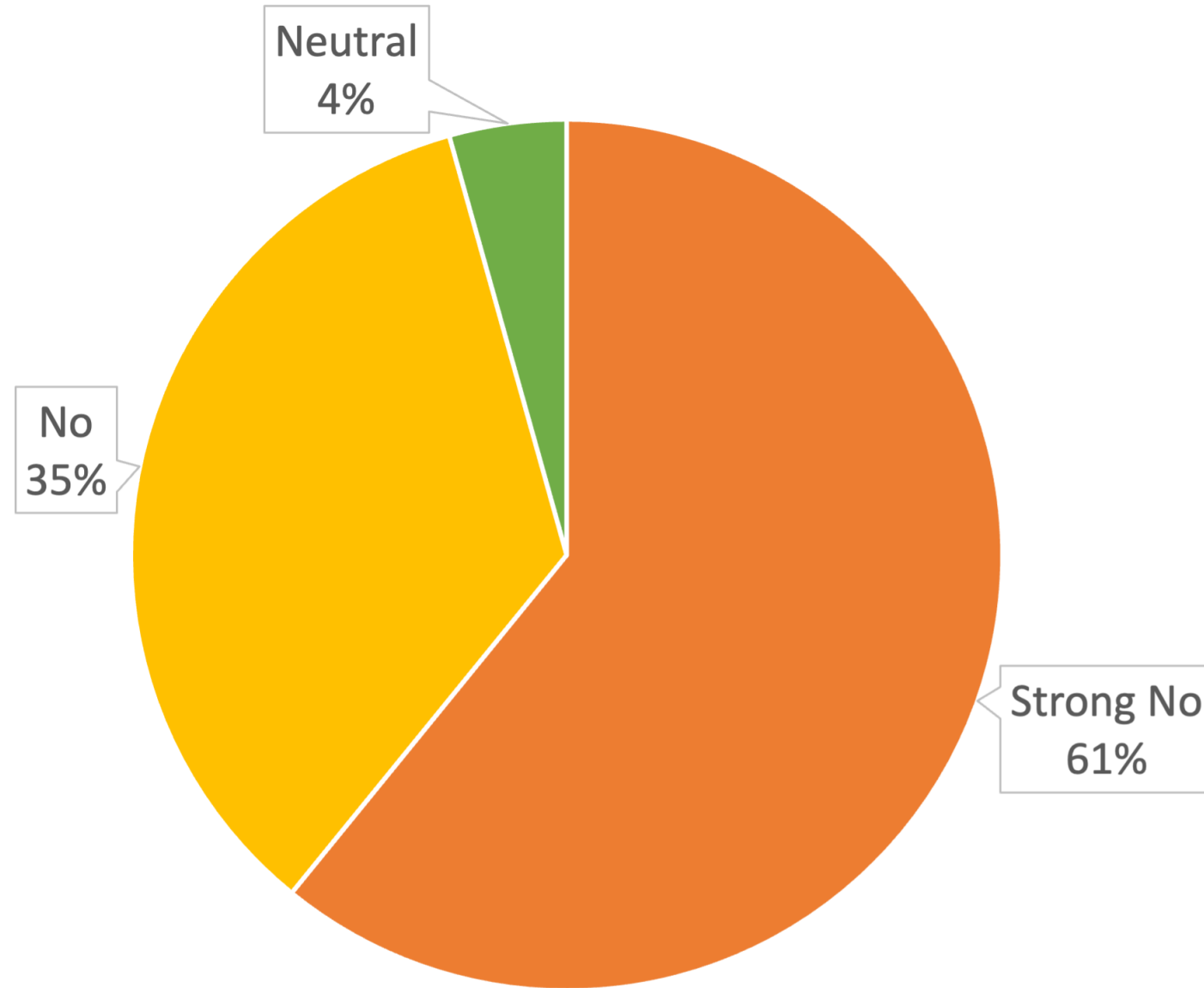


Kaupapa Hauwai Kākāriki Aotearoa
GH2P Green Hydrogen
Programme NZ
A GNS Science Led Research Programme

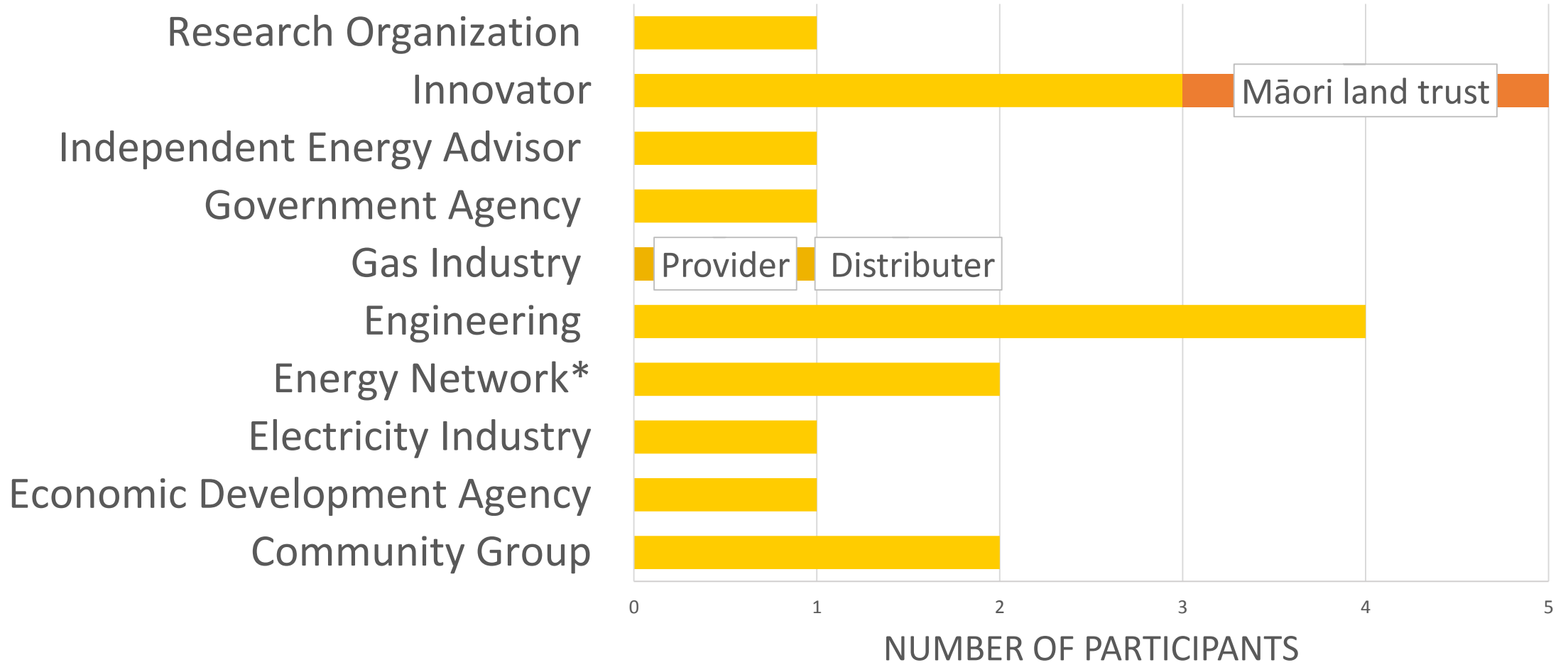
Social Science of Green Hydrogen?

- As a technology which is in the R&D or innovation stage much of what we know about green hydrogen is limited to the claims which are ascribed to it
 - Much of this knowledge is held by 'experts' within fields related to energy transitions rather than the general public
- At this stage we relied on interviews from experts to help us understand if green hydrogen should be part of the New Zealand energy system, and if so, what would that look like?

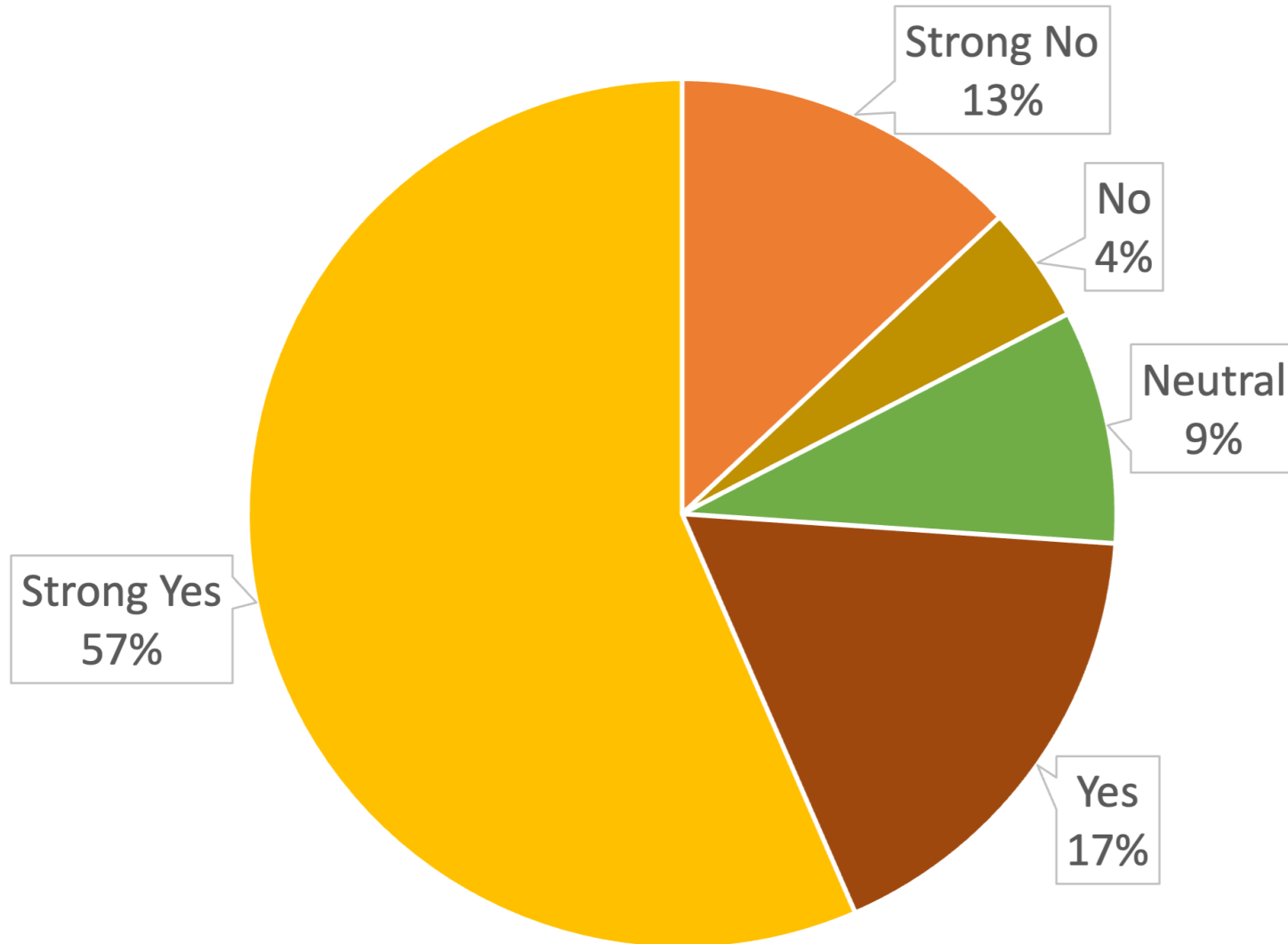
Does the public have a good understanding of GH?



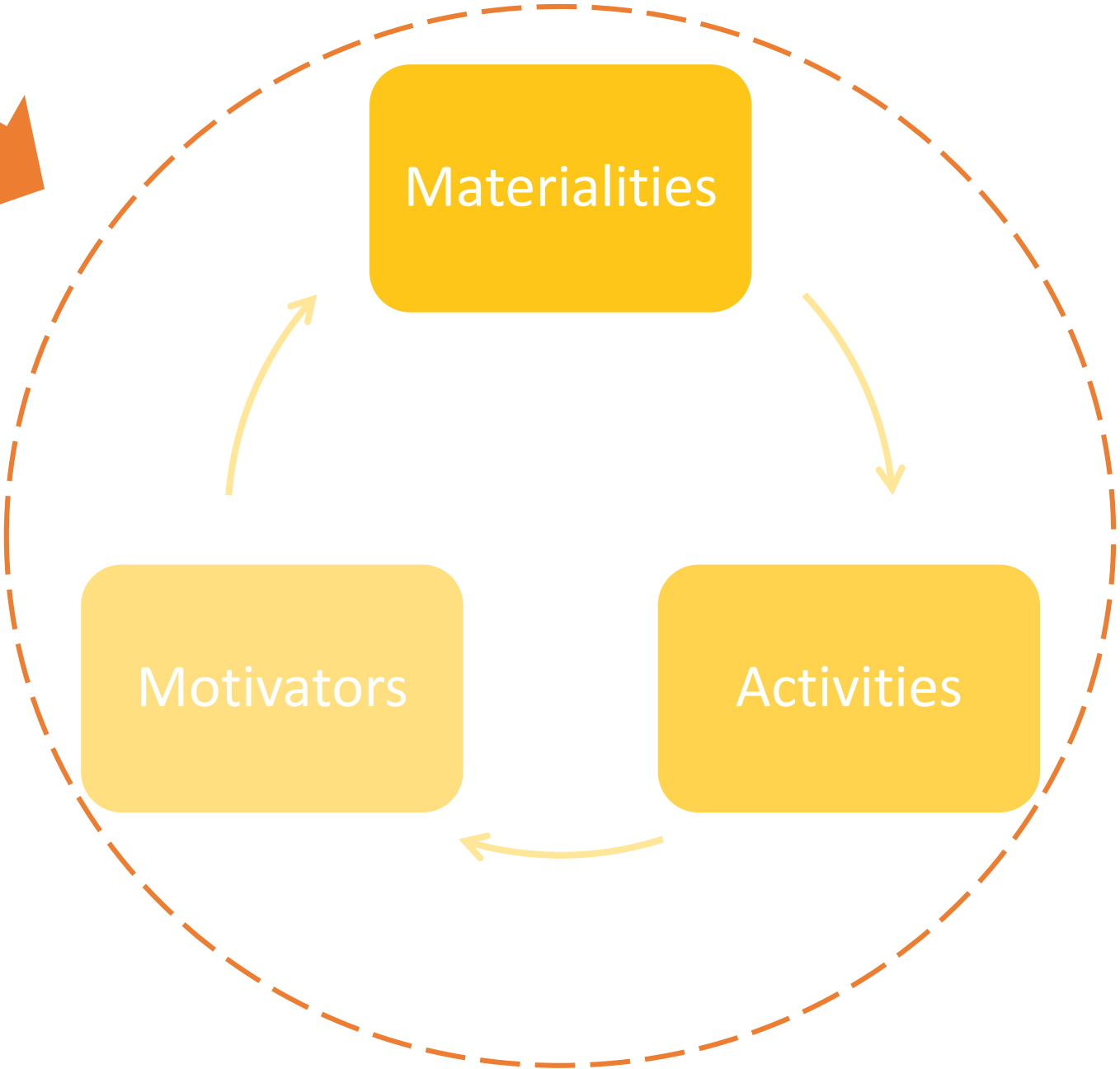
GREEN HYDROGEN EXPERTS INTERVIEWED BY SPECIALISATION



Do you see GH as a necessary factor for NZ to achieve its 2050 net zero carbon target?



External Influences



Materialities

Motivators

Activities

Why use an energy cultures framework?

- Provides a way to observe how social factors are part of the development and adoption of energy technologies
 - This relationship is reciprocal. Technologies do not determine social dynamics more than social dynamics influence technologies
- Offers a contextual way to understand behaviour
 - Technological adoption is not straight forward
 - This approach hopes to expose the aspects which most strongly influence behaviour, either to change or continue the status-quo
- Brings together interdisciplinary perspectives
 - Attempts to understand energy systems from a diversity of knowledges

- Economic Investment
- Legislation
- Environmental challenges

External Influences



Materialities

- Electrolysis & electrolyser
- Electricity cost
- Geography
- Renewables



- Perception as a 'Silver Bullet'
- Willingness for change
- Concerns of risk & safety
- Need for Gov. policy and regulation

Motivators

Activities

- Transport (personal and heavy)
- Agriculture
- Industrial Processing
- Forestry



Conclusion

- It is difficult to predict the social dynamics associated with green hydrogen as we are dealing with limited expectations
- Experts generally saw green hydrogen as a solution to niche decarbonization problems. Within this there was variation on what the 'best' application was.
 - Outside of this some experts disagreed with its application in any sector
- Its important to not consider 'the social' to be completely distinct from 'the technical' but as interconnected and interdependent
- Expectations about green hydrogen are associated with materialities, practices and assumptions which come into conflict with other expectations of New Zealand's future energy transition