

# Culture and (energy) transitions

Keynote for 'Climate Emergency! Energy Crisis!'

A symposium on responsibility, inclusion and place-based action

Janet Stephenson

Centre for Sustainability, University of Otago

15 September 2022 (30 min)

# IPCC report: 'now or never' if world is to stave off climate disaster

Greenhouse gas emissions must peak by 2025, say climate scientists in what is in effect their final warning

- **Analysis: IPCC spells out what's needed to avert climate disaster**
- **What does the IPCC report say?**

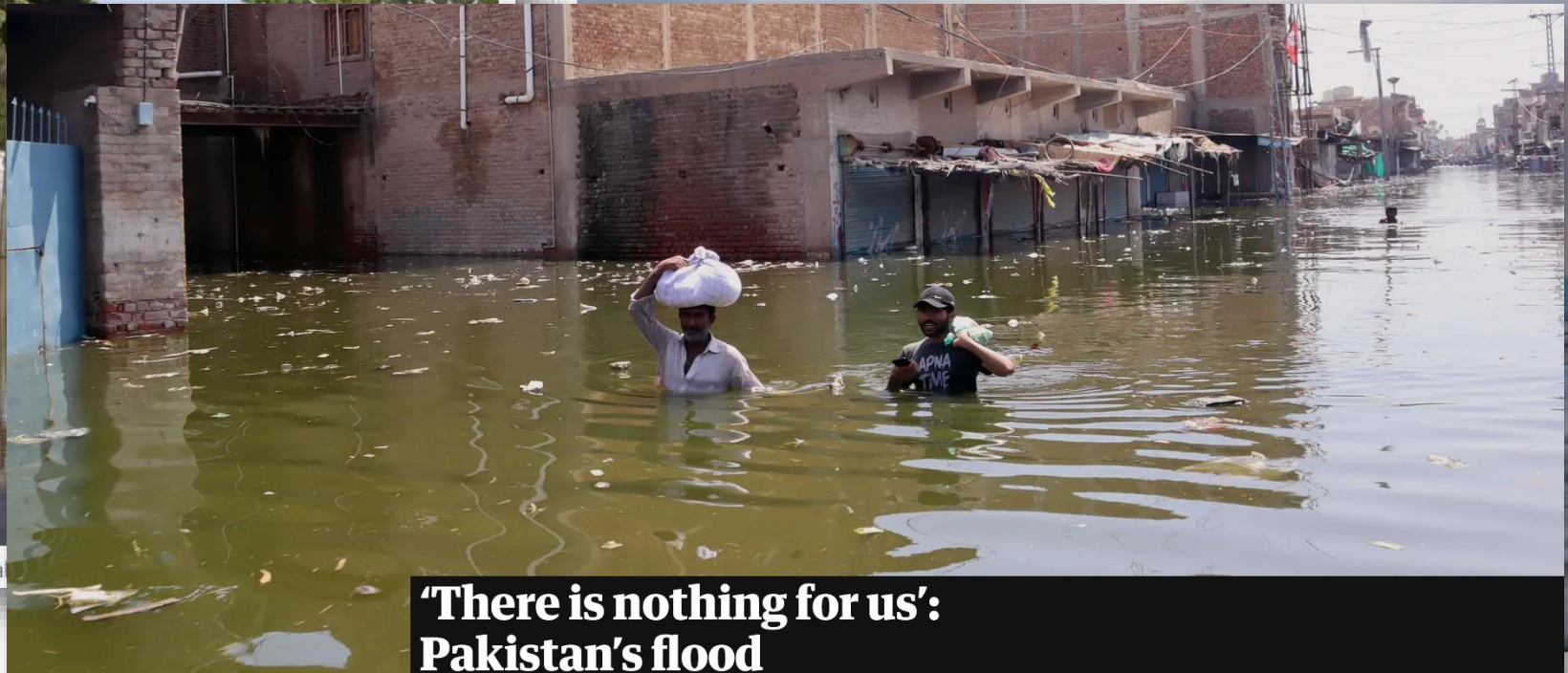


Flooded streets in New South Wales, Australia

Guardian 4 April 2022

# World on brink of five 'disastrous' climate tipping points, study finds

Giant ice sheets, ocean currents and permafrost regions may already have passed point of irreversible change



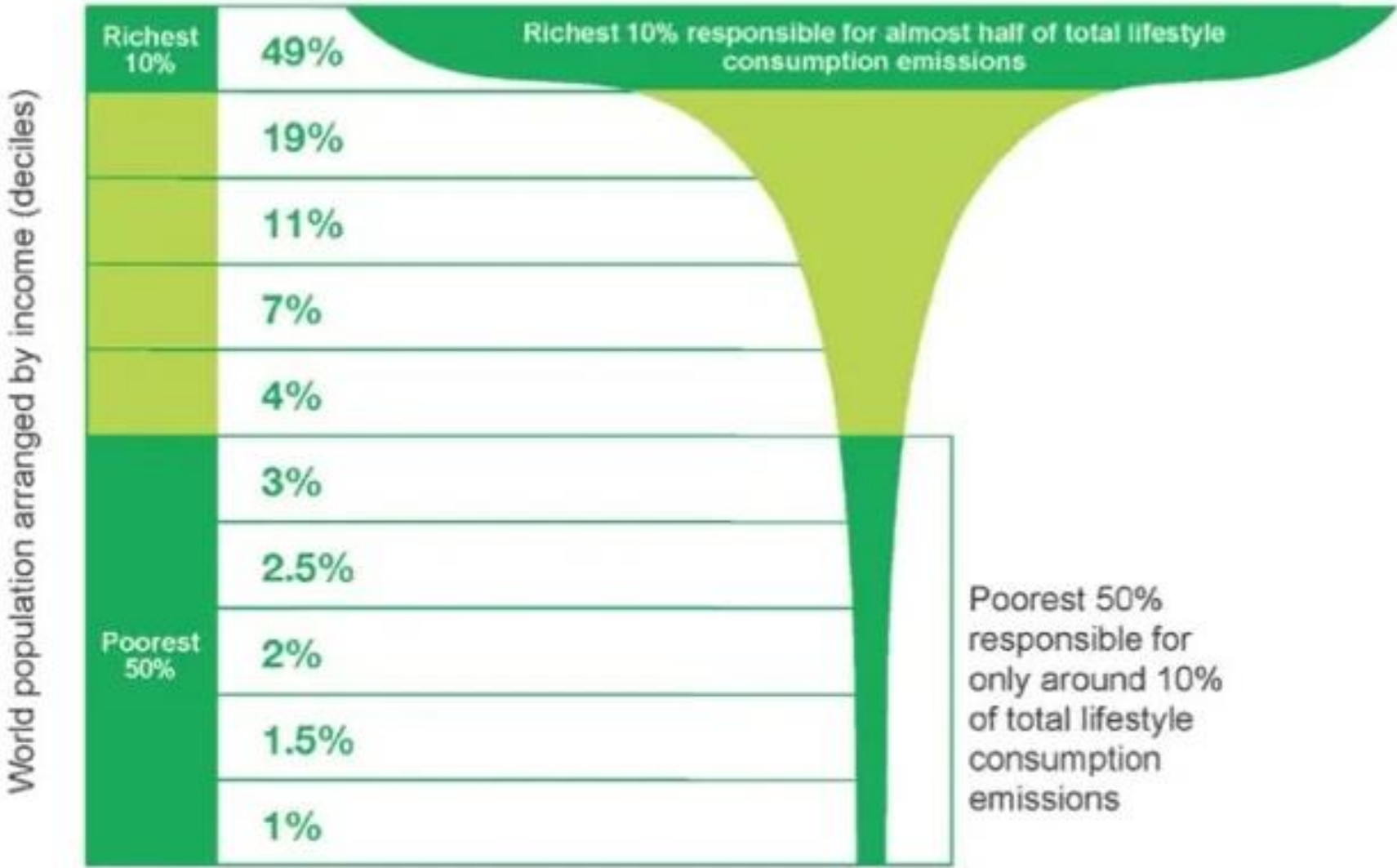
People carrying their belongings through flooded streets in Khairpur Nathan Shah. Photograph: Shah Meer Baloch

**"There is nothing for us":  
Pakistan's flood  
homeless start to despair**

Guardian 7 September 2022      Guardian 8 September 2022

ve been

# Percentage of CO<sub>2</sub> emissions by world population



Oxfam 2015: Global income deciles and associated lifestyle consumption emissions

# Culture?

*“a dynamically stable process of collectively made, reproduced, and unevenly shared knowledge structures that are informational and meaningful, internally embodied, and externally represented and that provide predictability, coordination equilibria, continuity, and meaning in human actions and interactions”*

# The problem with culture

In an everyday sense:

- Identity, otherness
- Vague, multiple meanings
- Deflection

In an academic sense:

- Fragmented approaches, multiple meanings, tortuous language
- Unhelpfully complex

Sociology of culture

Art and performance

Anthropology

Cultural sociology

Organisational culture

Culturalist mentalism

Textualism

Intersubjectivism

Cultural archaeology

Practice theory

Cultural geography





Image: Janet Stephenson

# Energy Cultures team 2009-16

Dr Paul Thorsnes  
economics

Dr Janet Stephenson  
sociology/  
human geography

Prof. Rob Lawson  
consumer  
psychology

Prof. Barry Barton  
law & policy

Dr Miranda  
consumer

Prof. Gerry Carrington  
physics/  
engineering



Dr Debbie Hopkins  
environmental  
sociology



Dr Sara Walton  
management



Dr John Williams  
marketing



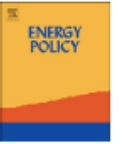
Dr Rebecca  
engineering



Contents lists available at ScienceDirect

Energy Policy

journal homepage: [www.elsevier.com/locate/enpol](http://www.elsevier.com/locate/enpol)



## Energy cultures: A framework for understanding energy behaviours

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ARTICLE INFO

ABSTRACT

THE CAMBRIDGE HANDBOOK OF ENVIRONMENTAL SOCIOLOGY

## 14 Sustainability Cultures: Exploring the Relationships Between Cultural Attributes and Sustainability Outcomes

Janet Stephenson

### 1 Introduction

'We need a culture change'. When achieving sustainability seems impossibly

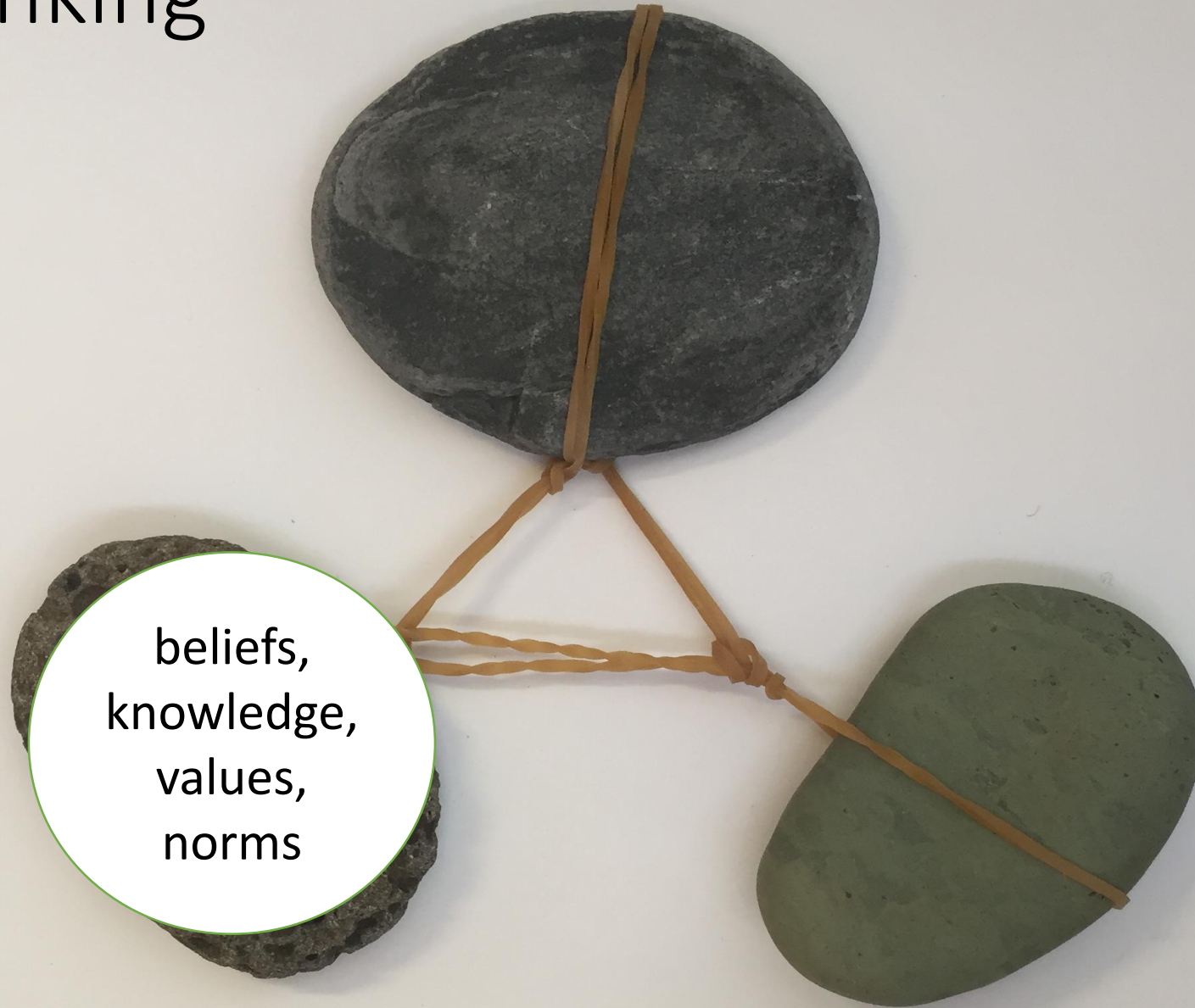




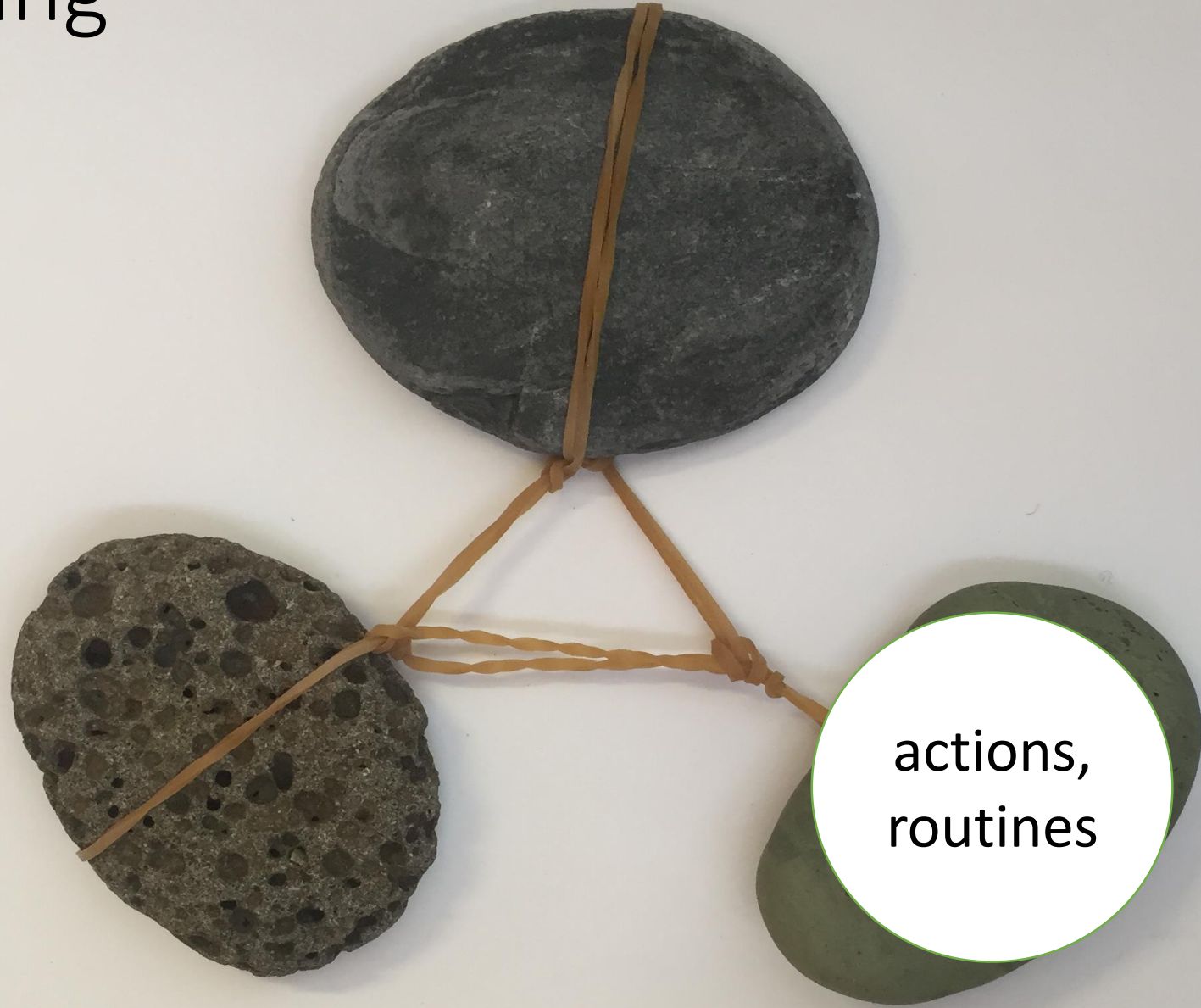
Image: Janet Stephenson



# Ways of thinking

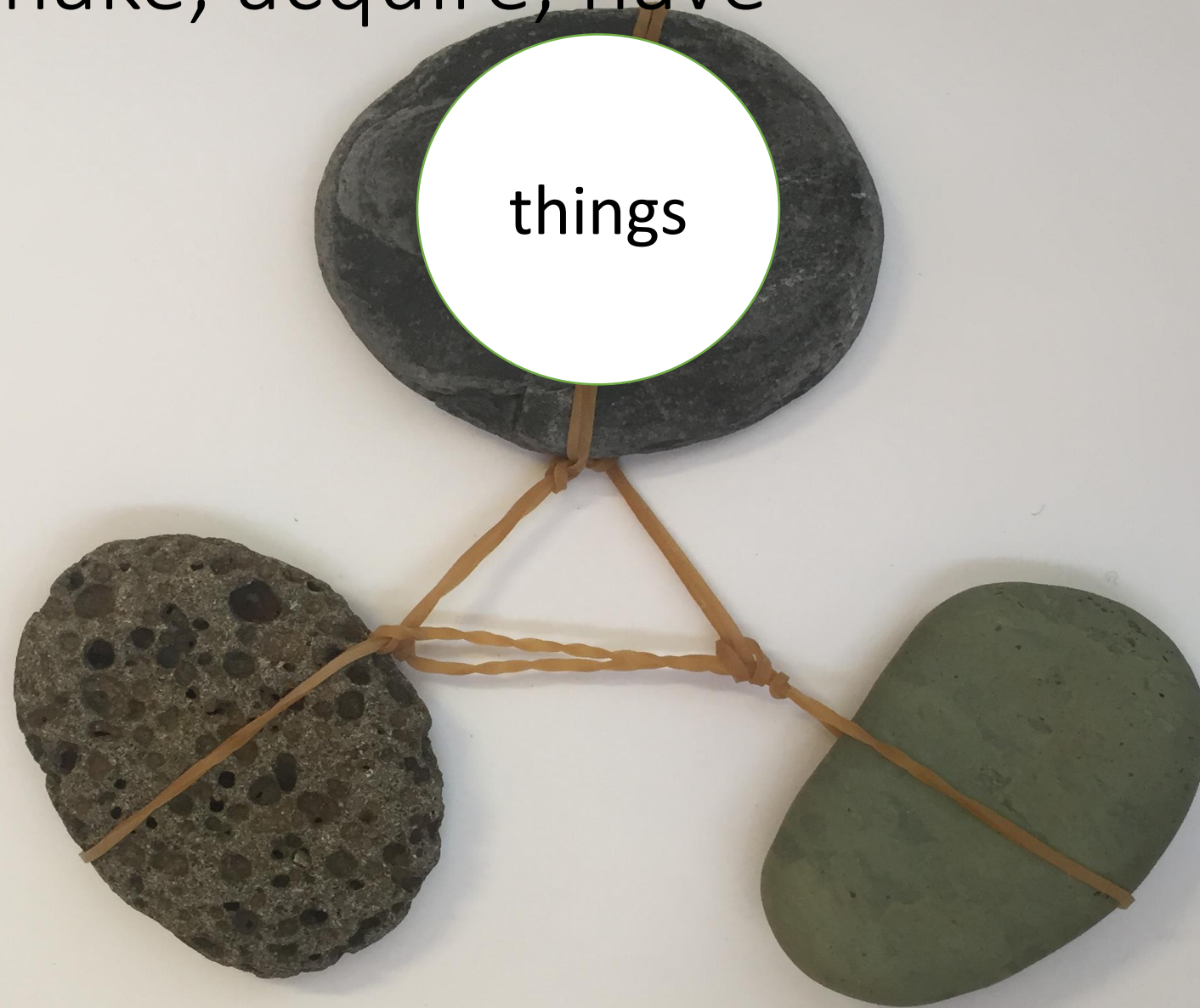


# Ways of doing

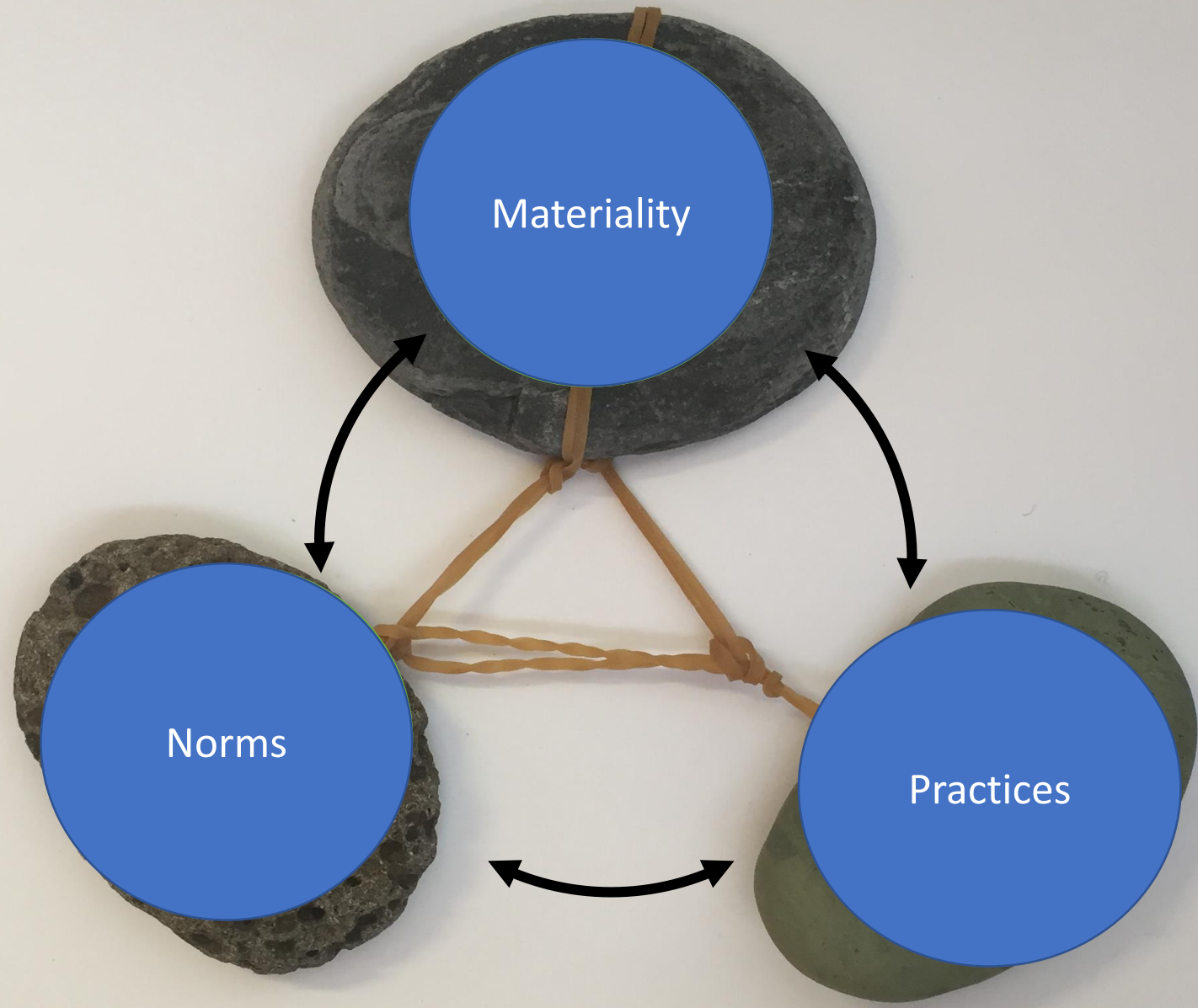




Things we make, acquire, have



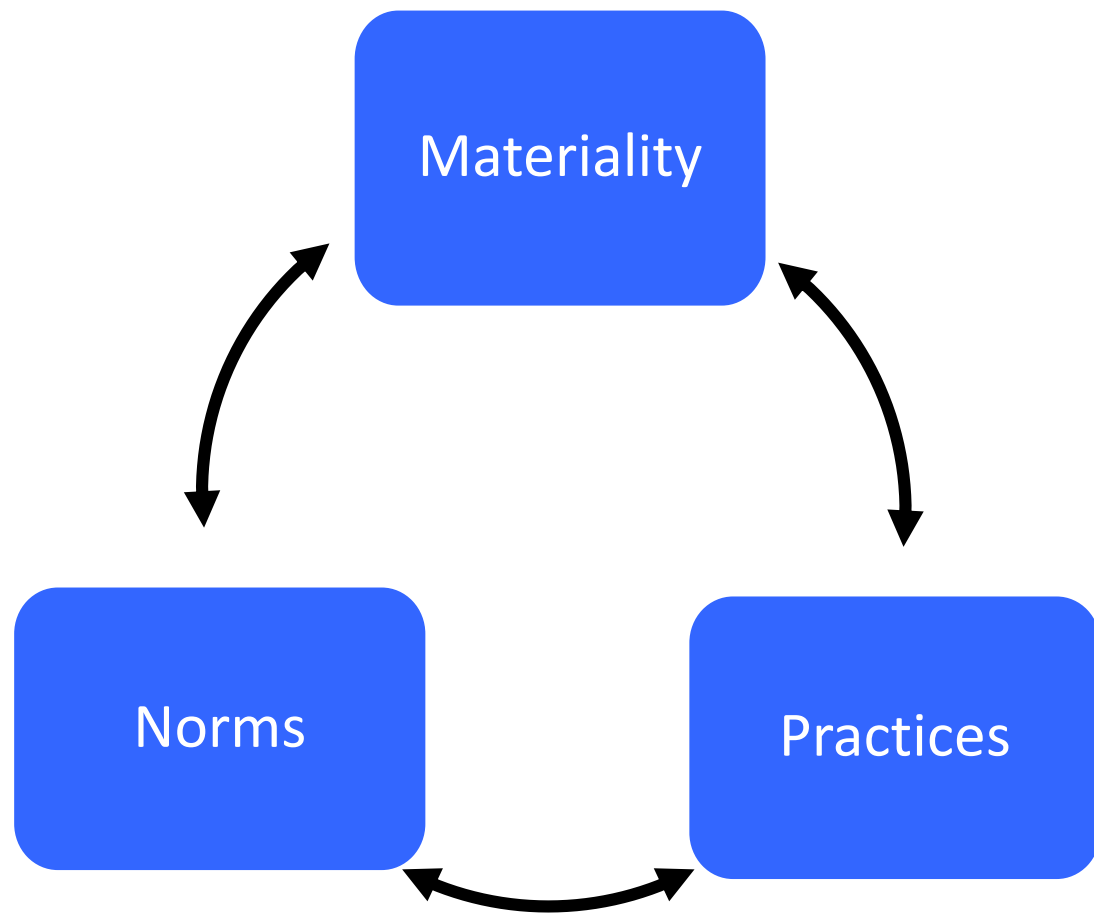




Materiality

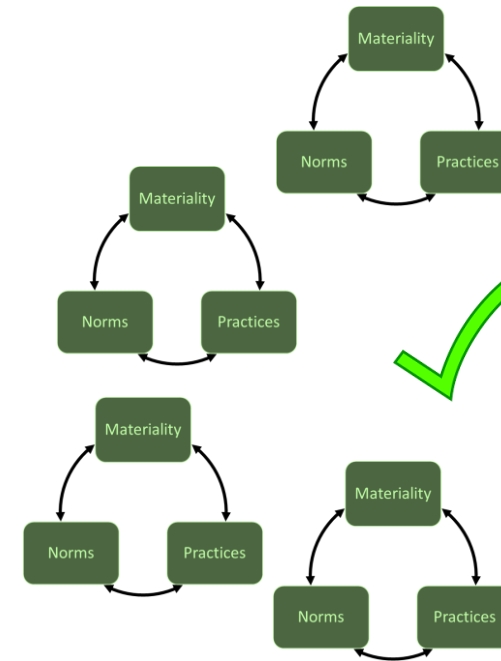
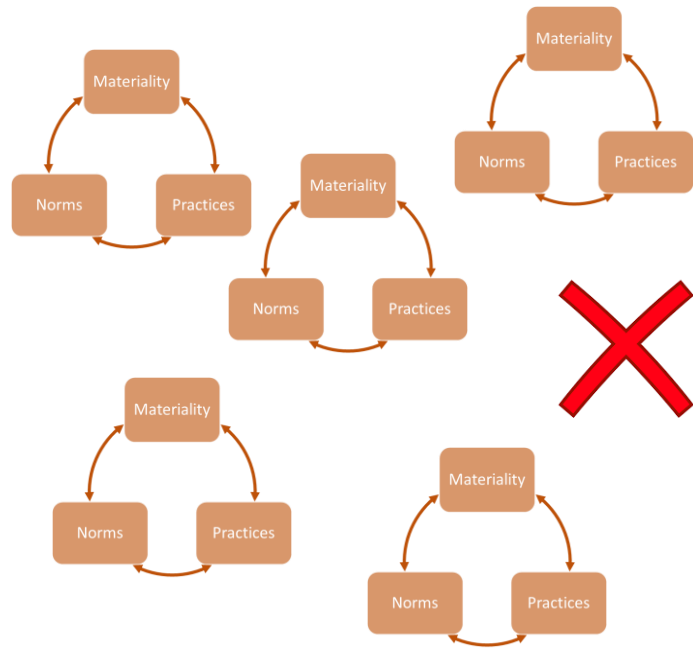
Norms

Practices



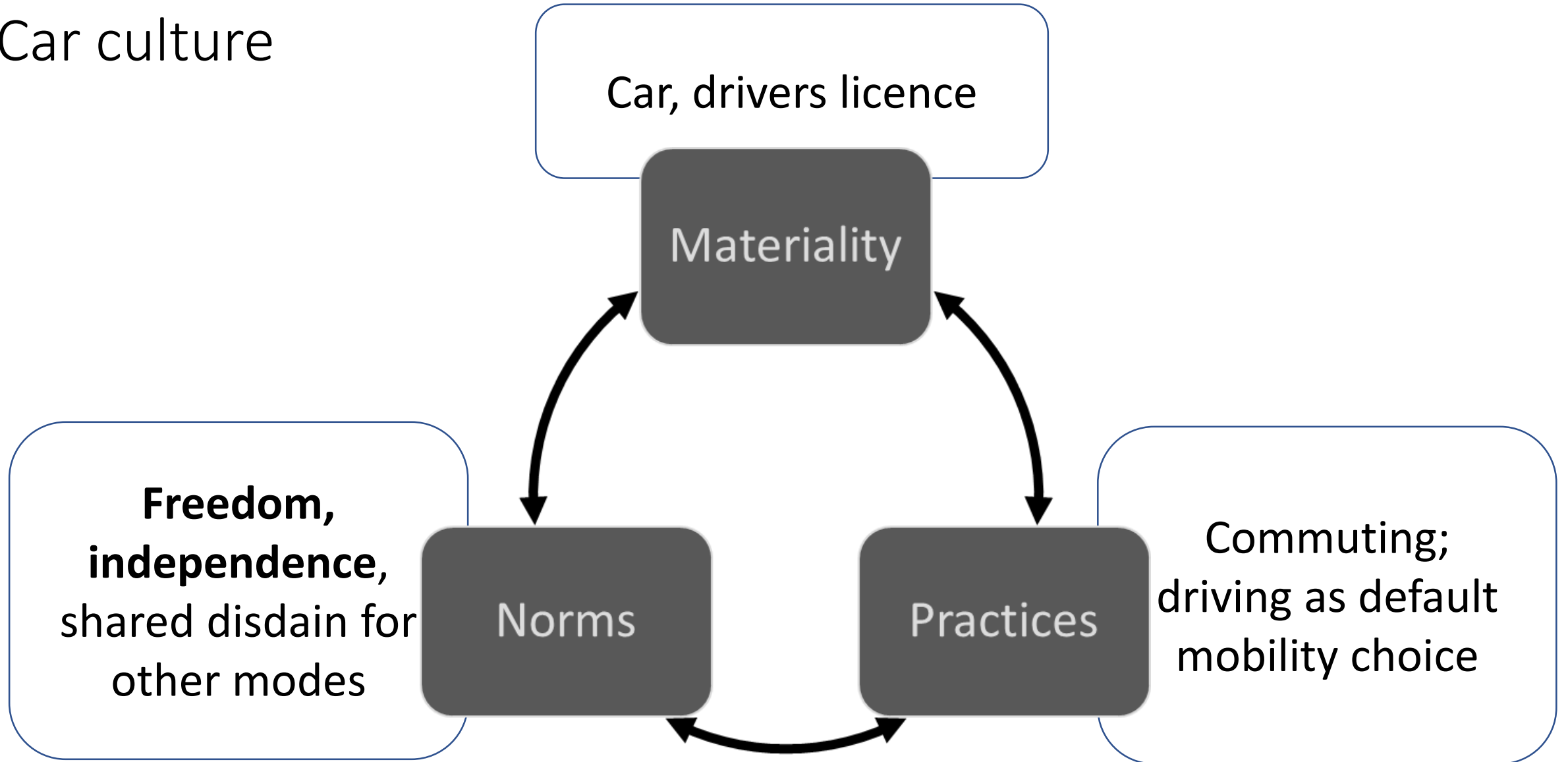
Adapted from Stephenson et al., 2010, 2015; Stephenson 2018, 2020.

# Different cultural characteristics give different sustainability outcomes





# Car culture



# Multi-mobility culture

Bus pass, rain jacket,  
walking shoes, bike

Materiality

Climate concern  
collaboration,  
**freedom,**  
**independence**

Norms

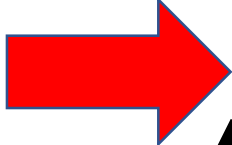
Practices

Walking, cycling,  
use of shared and  
public transport

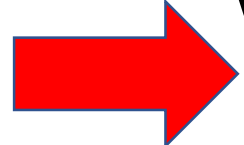
Adapted from Hopkins & Stephenson (2015, 2016)

# External influences reinforcing car culture

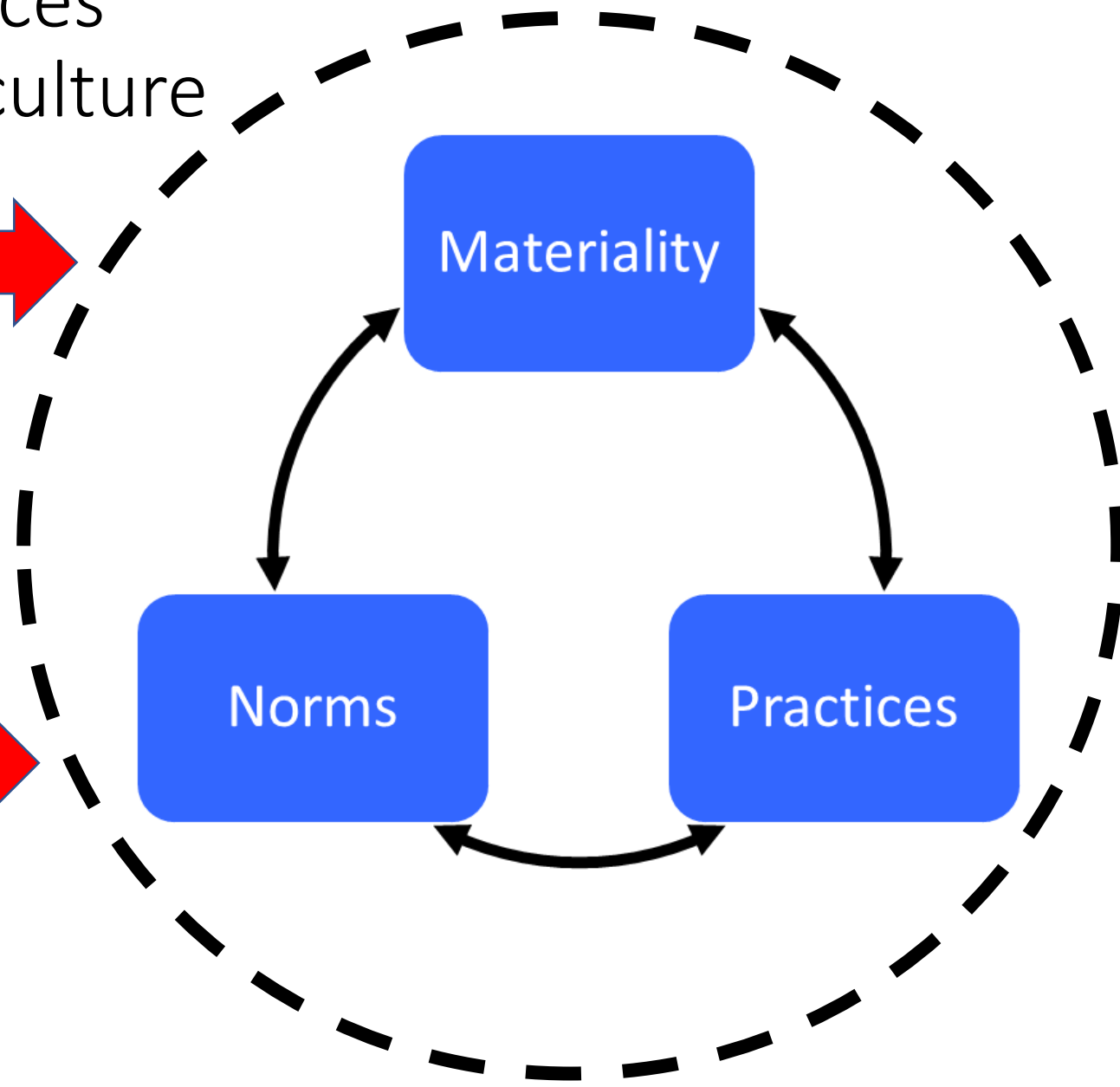
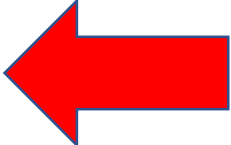
Investment in motorways



Car advertising



Policies on urban form



Adapted from Stephenson, Hopkins & Doering (2015)

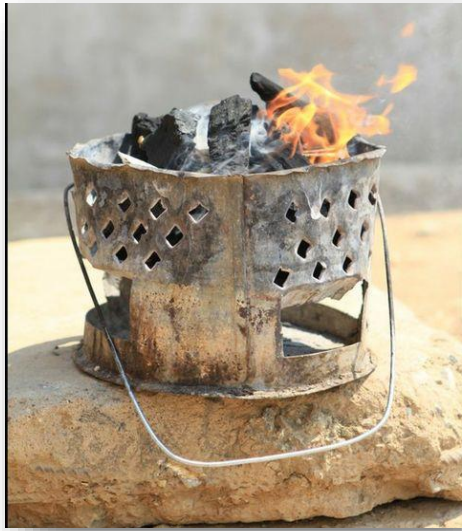


Cultural stasis

# Charcoal cookstoves in Zambia



Jürisoo, M., Serenje, N., Mwila, F., Lambe, F., & Osborne, M. (2019). Old habits die hard: Using the energy cultures framework to understand drivers of household-level energy transitions in urban Zambia. *Energy Research & Social Science*, 53, 59-67.



Charcoal stove

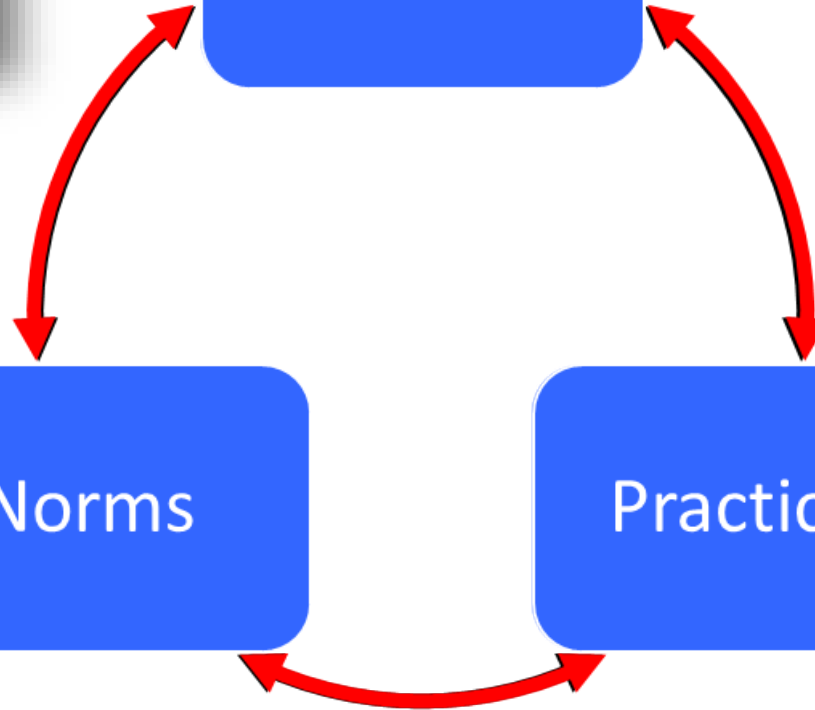
Materiality

Norms

Practices

Taste of food  
Efficiency  
Social engagement

Daily chores  
alongside cooking  
Social interactions





# Energy efficiency in the US Navy

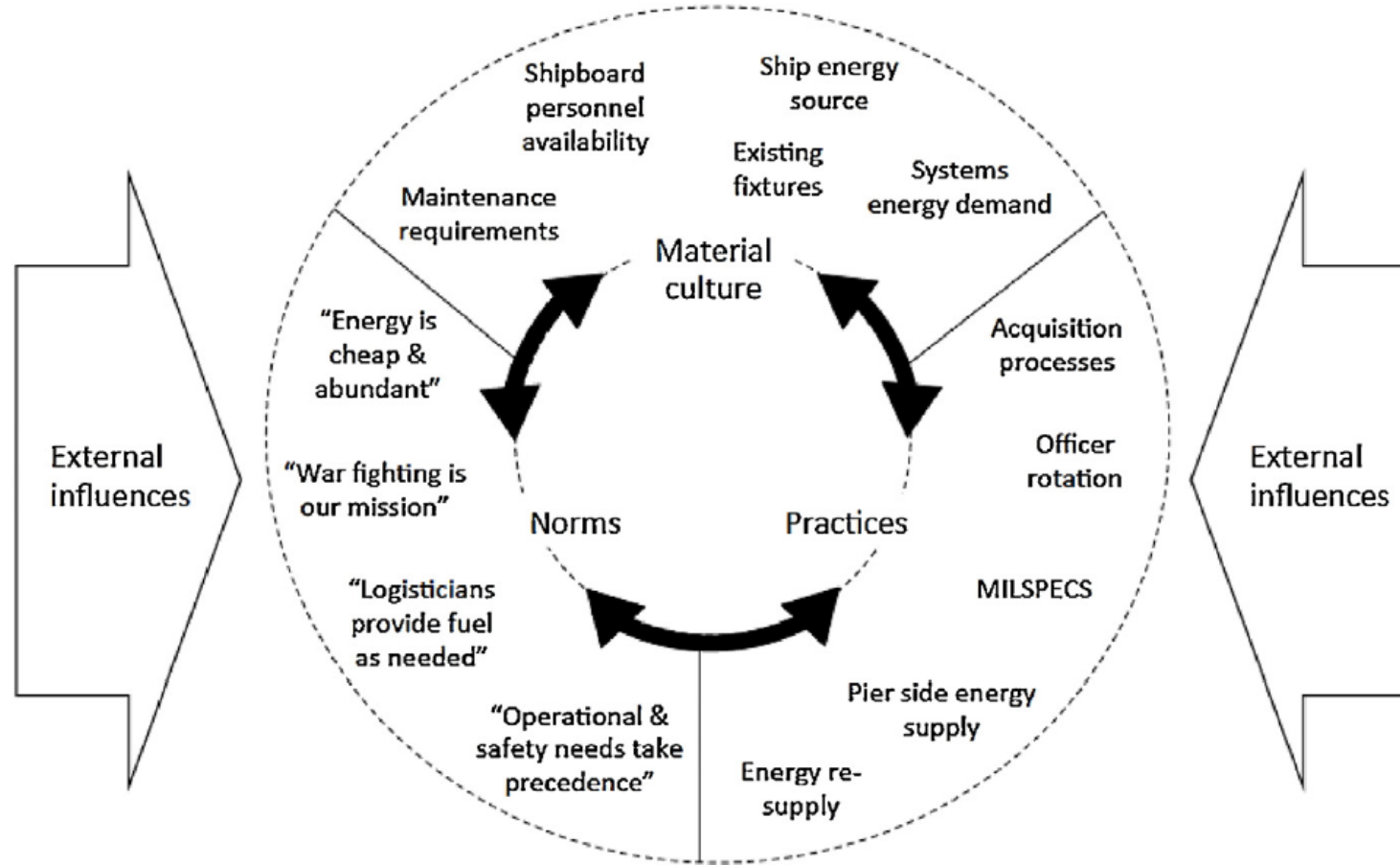


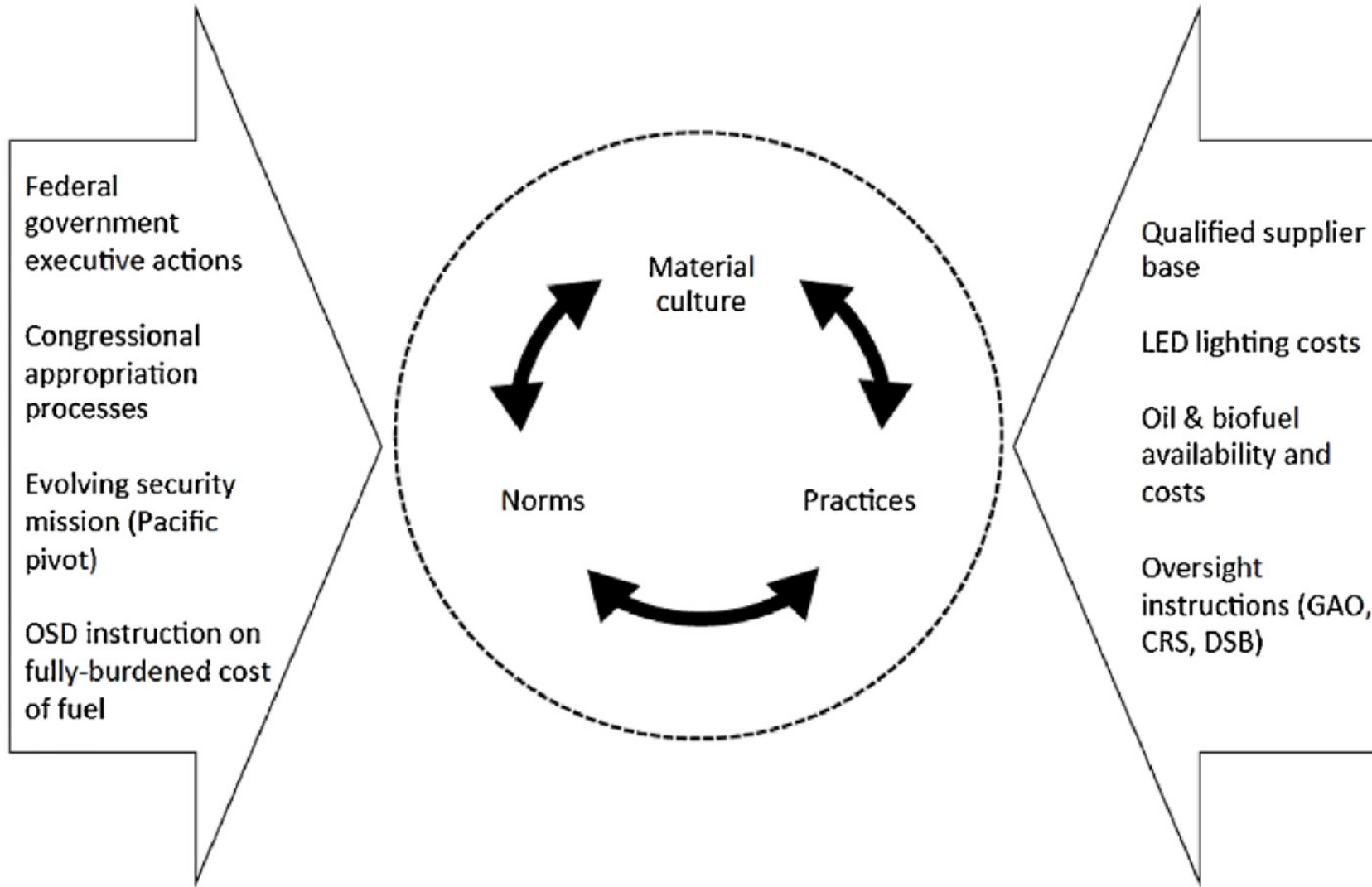
Fig 2. Internal elements of U.S. Navy energy culture.

Image:  
Wikipedia  
Commons

Dew, N., Aten, K., & Ferrer, G. (2017). How many admirals does it take to change a light bulb? Organizational innovation, energy efficiency, and the United States Navy's battle over LED lighting. *Energy research & social science*, 27, 57-67.

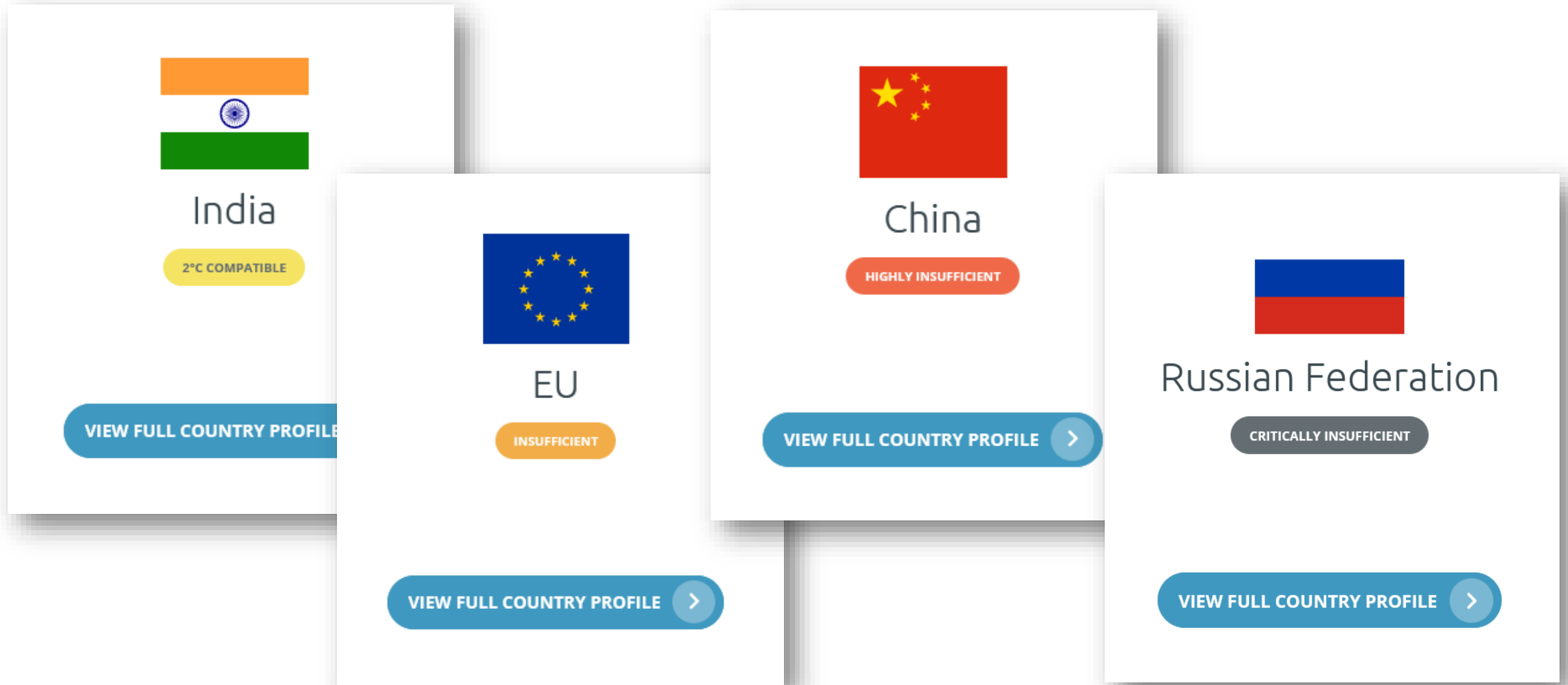


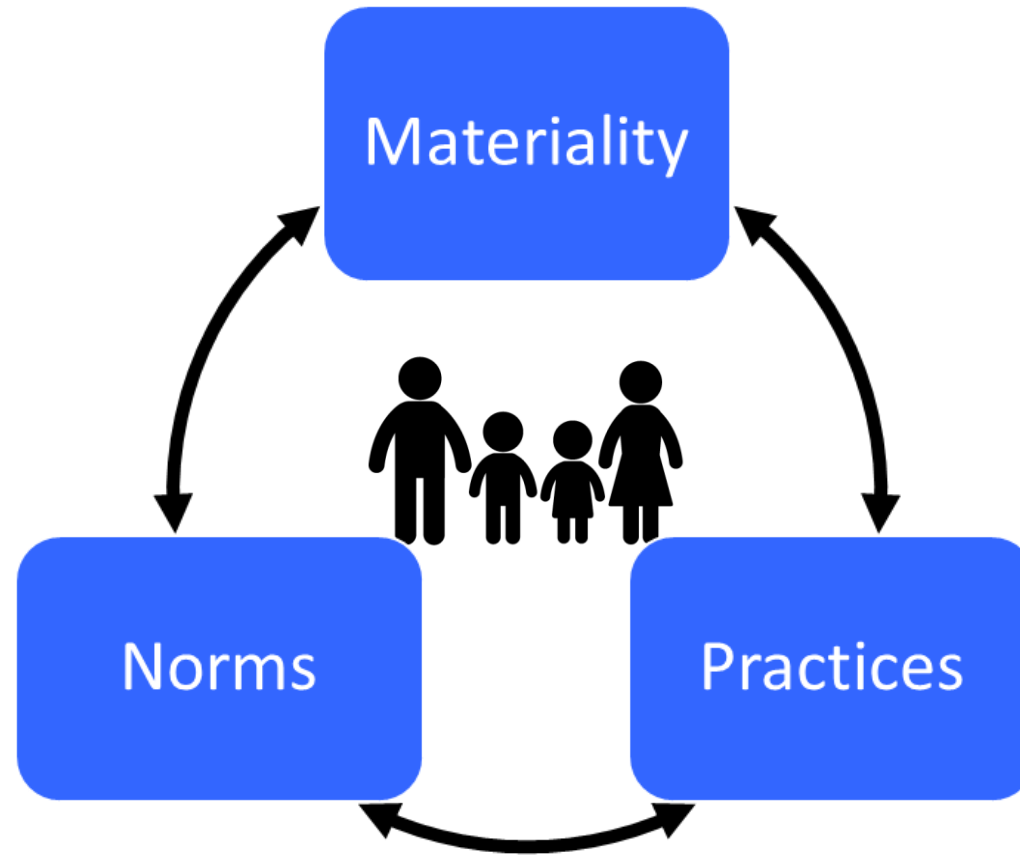
## External influences on U.S. Navy energy culture



Dew, N., Aten, K., & Ferrer, G. (2017). How many admirals does it take to change a light bulb? Organizational innovation, energy efficiency, and the United States Navy's battle over LED lighting. *Energy research & social science*, 27, 57-67.

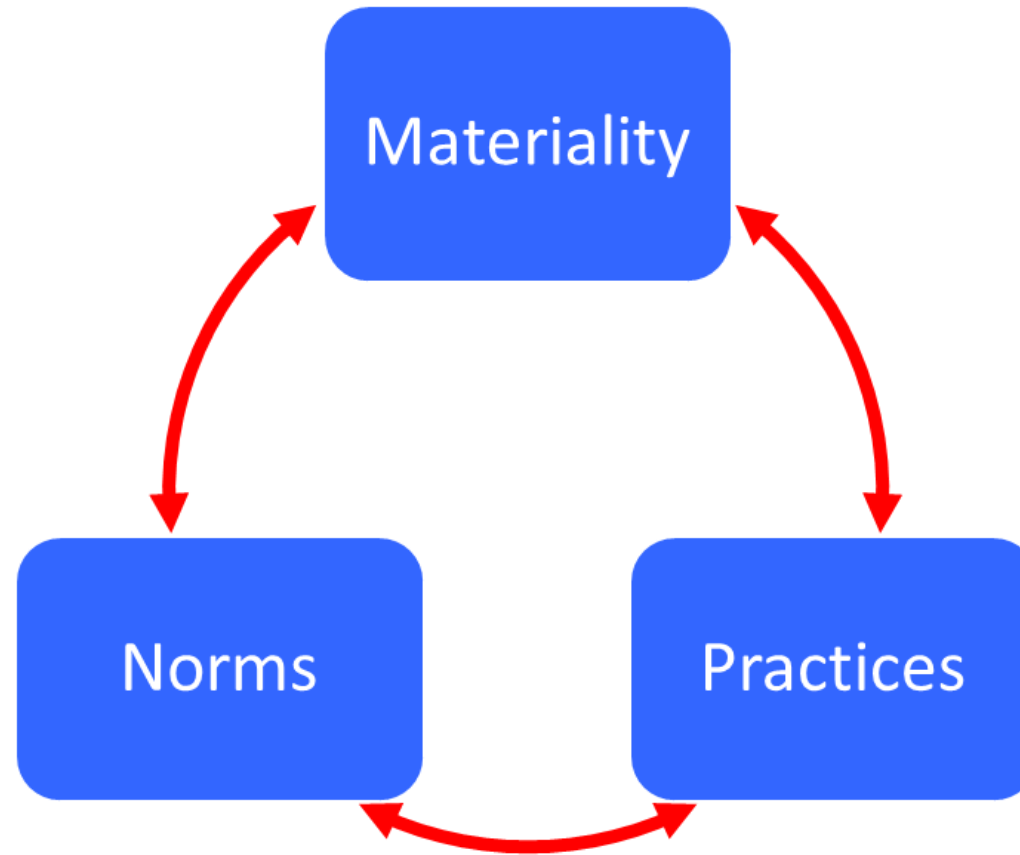
# Comparing national decarbonisation commitments

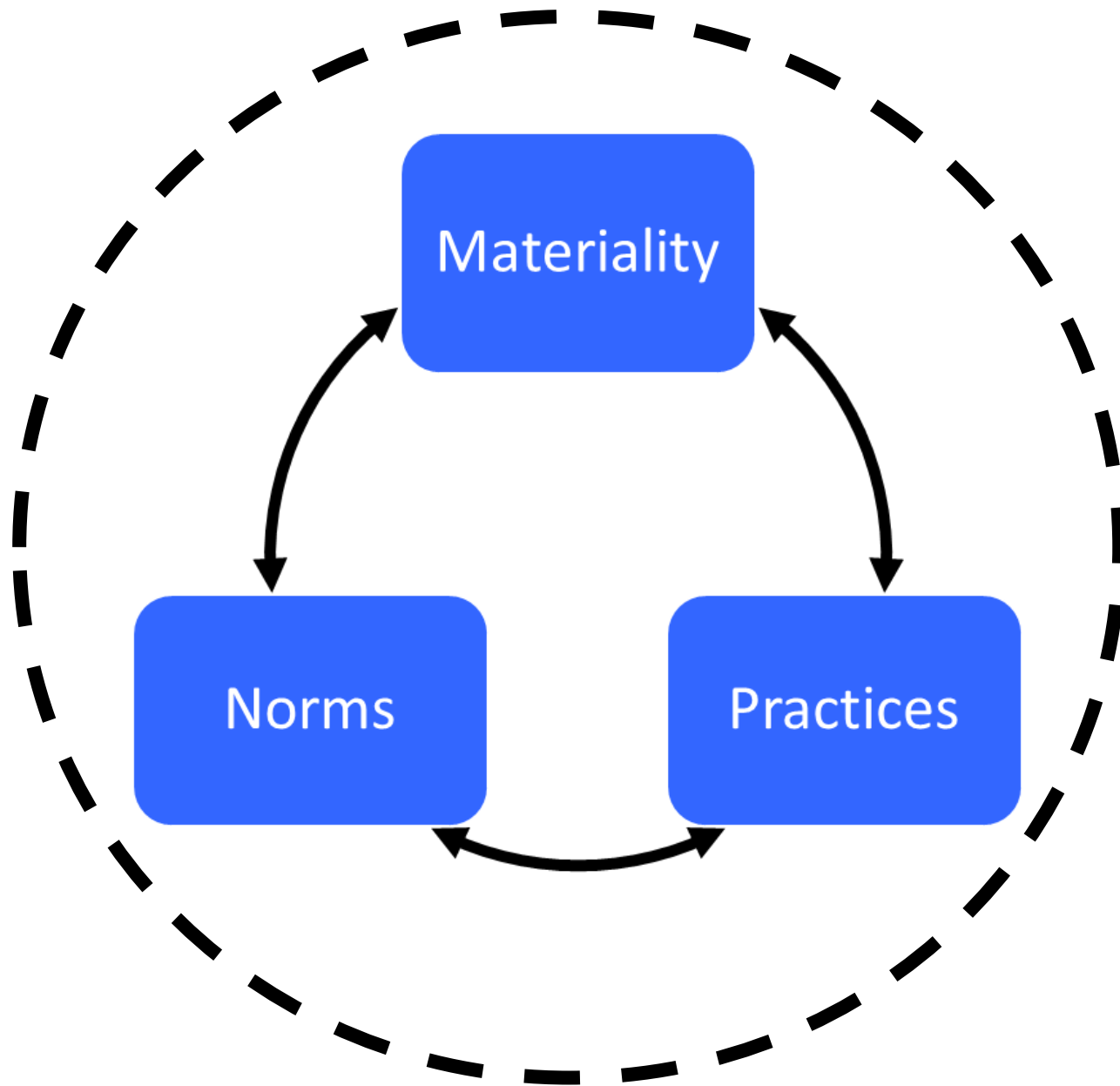
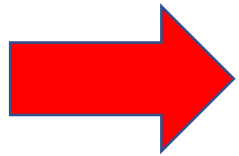






# Cultural dynamics

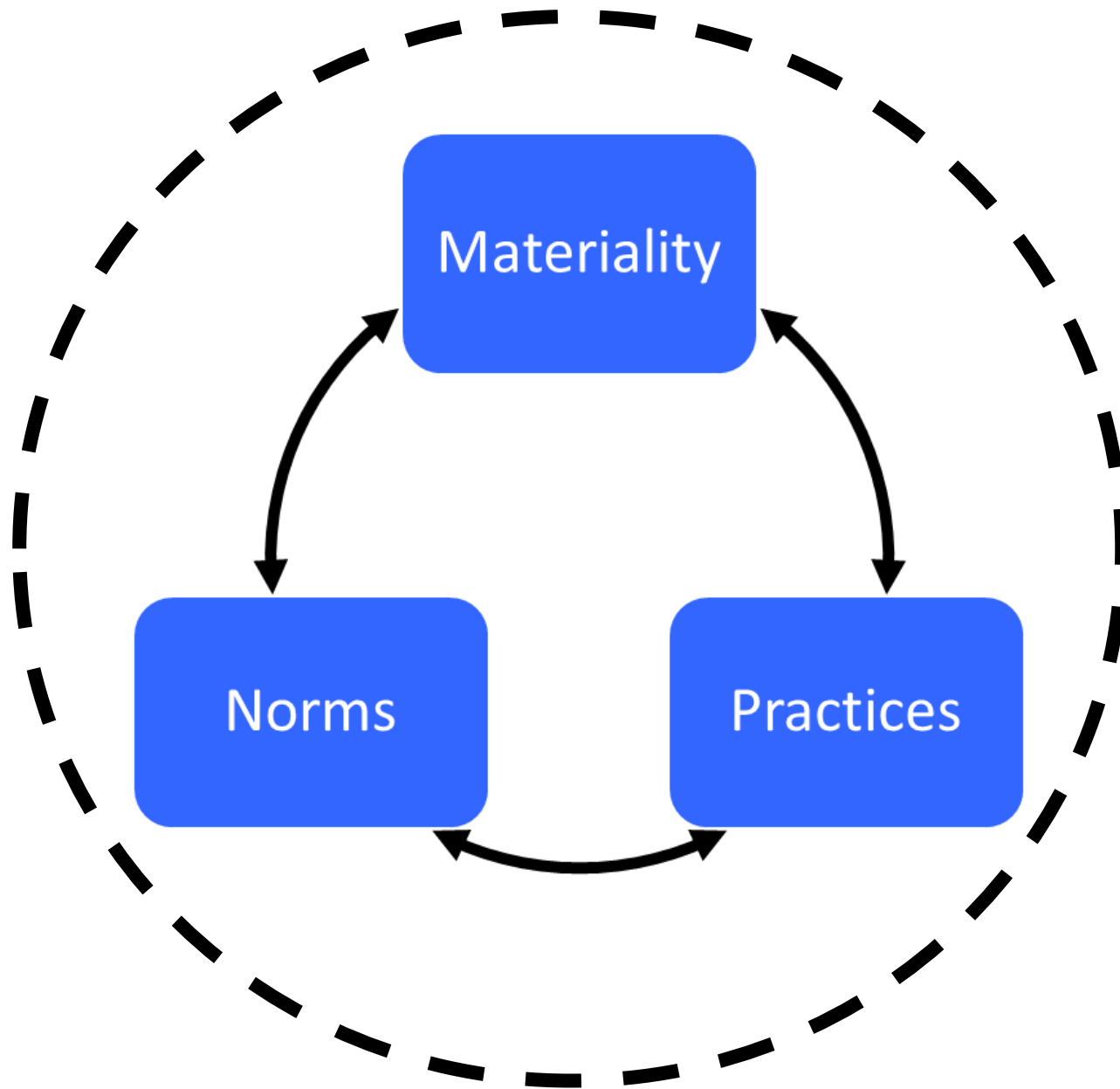
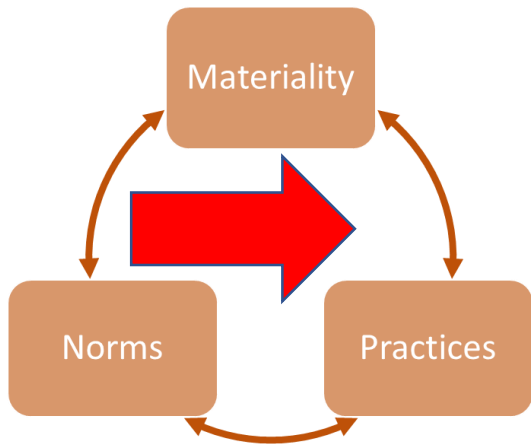


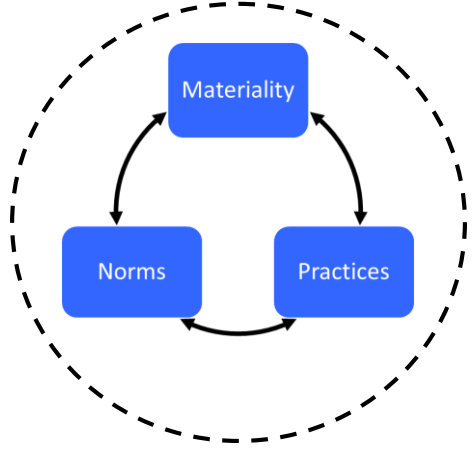
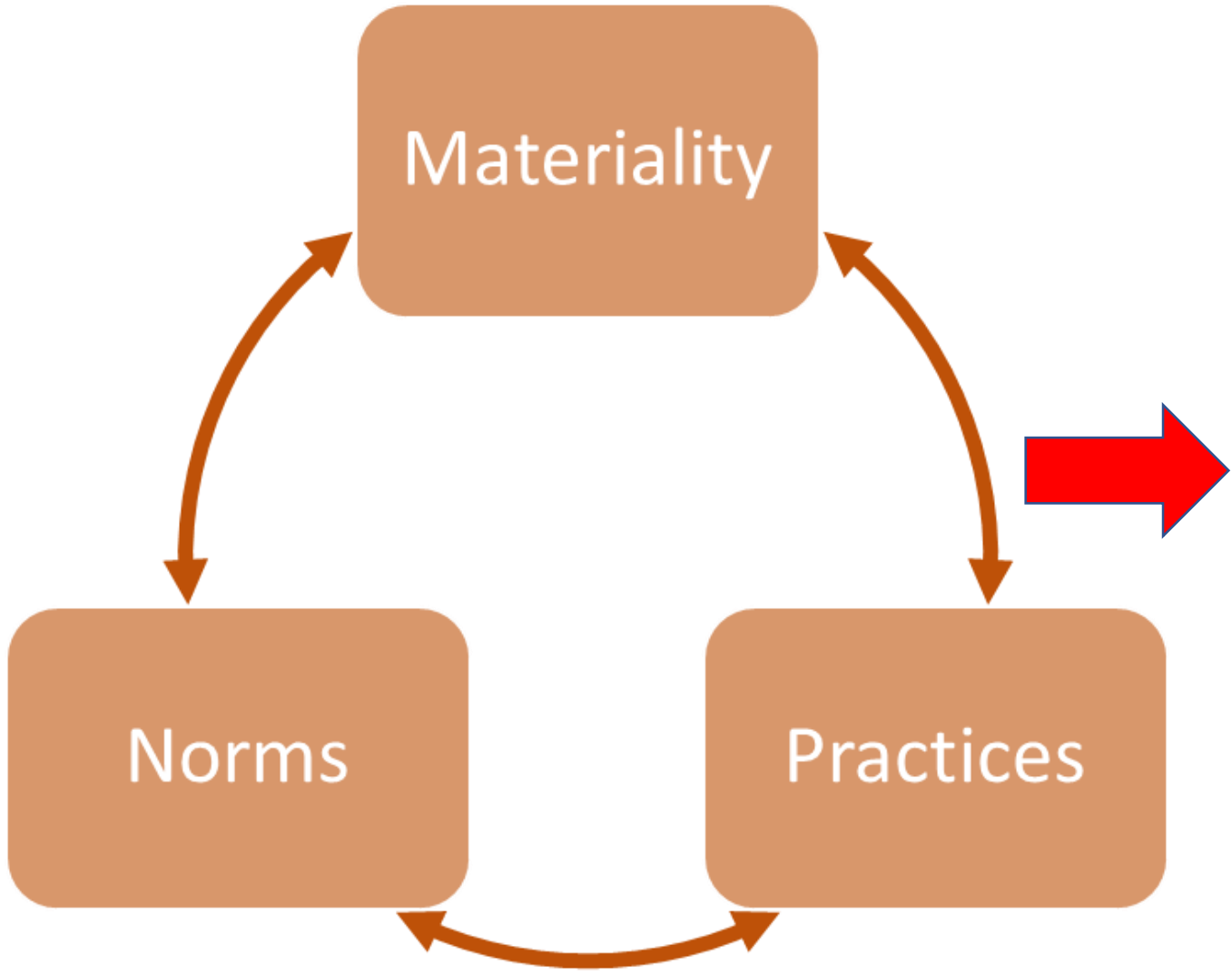


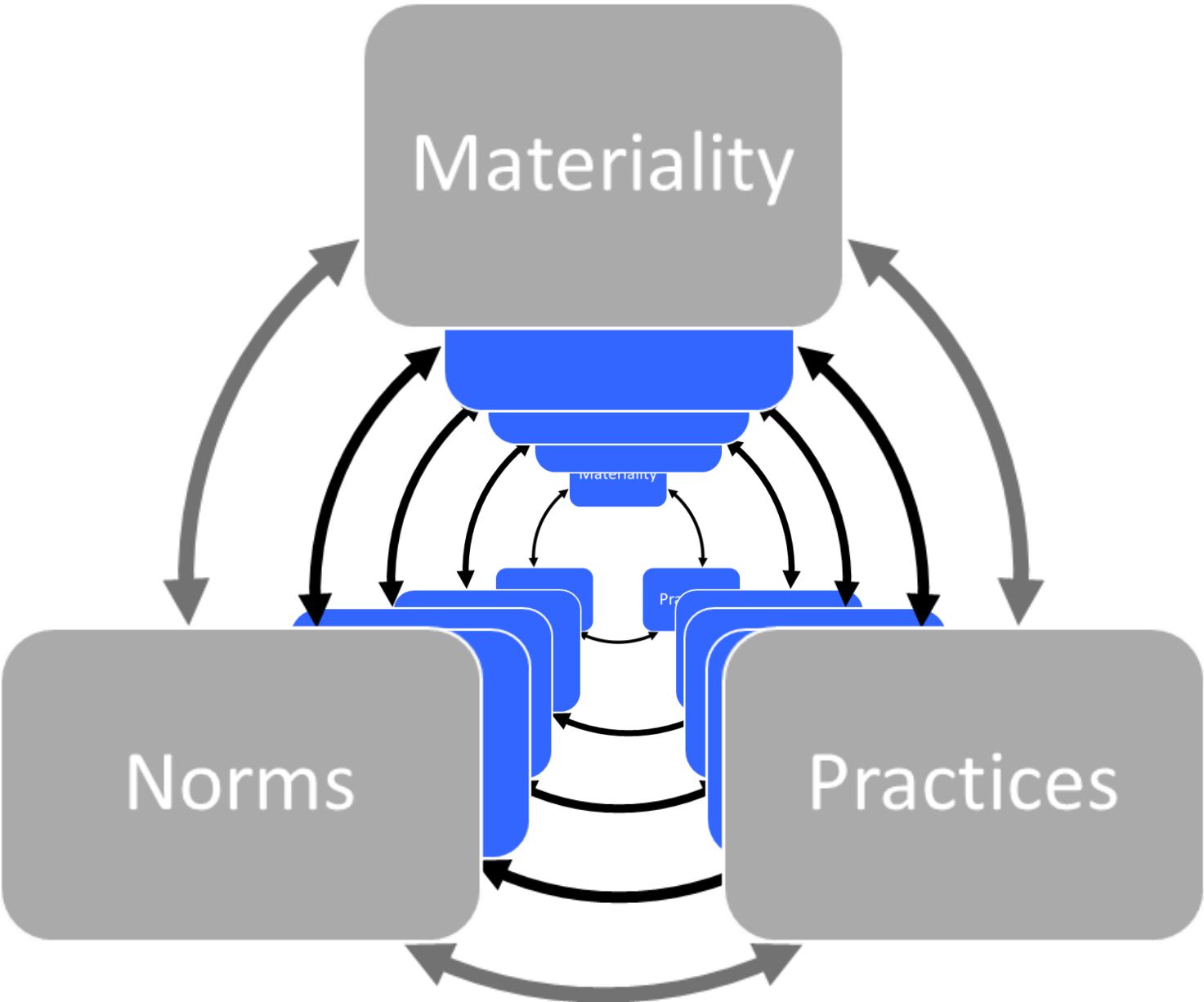
Materiality

Norms

Practices



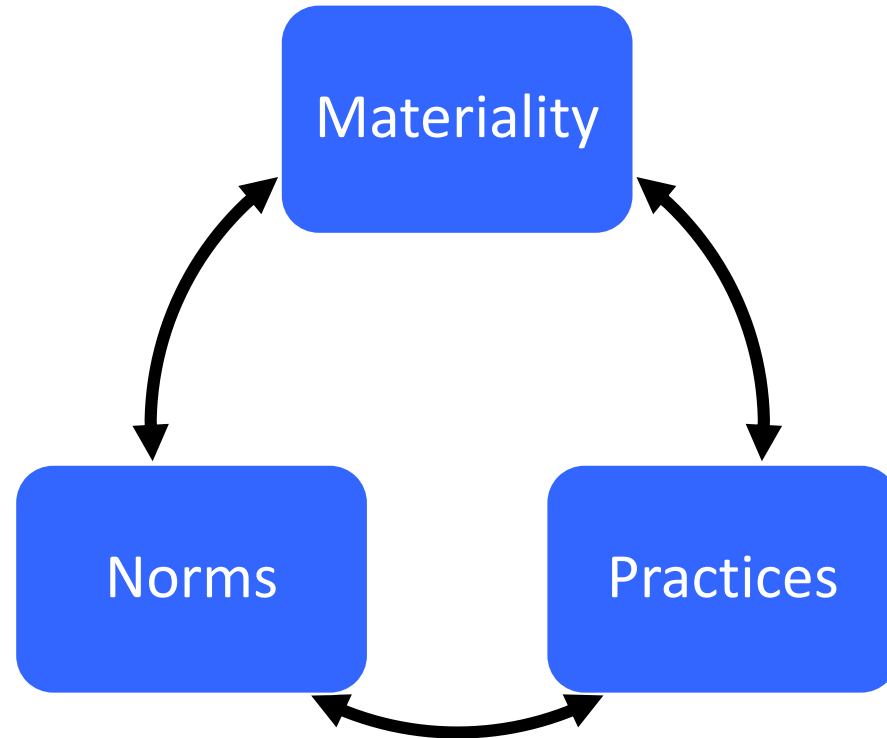




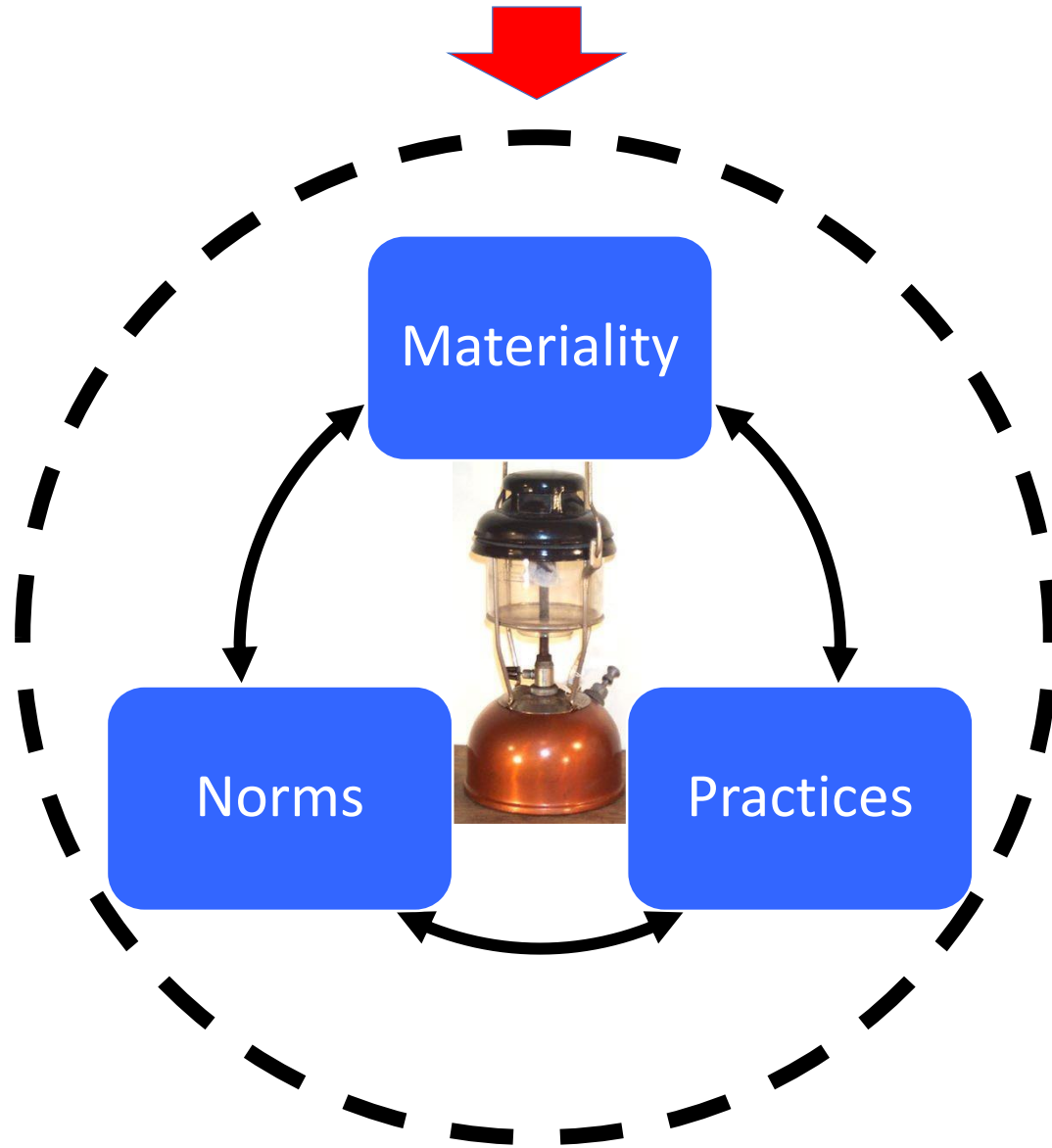


Culture and change

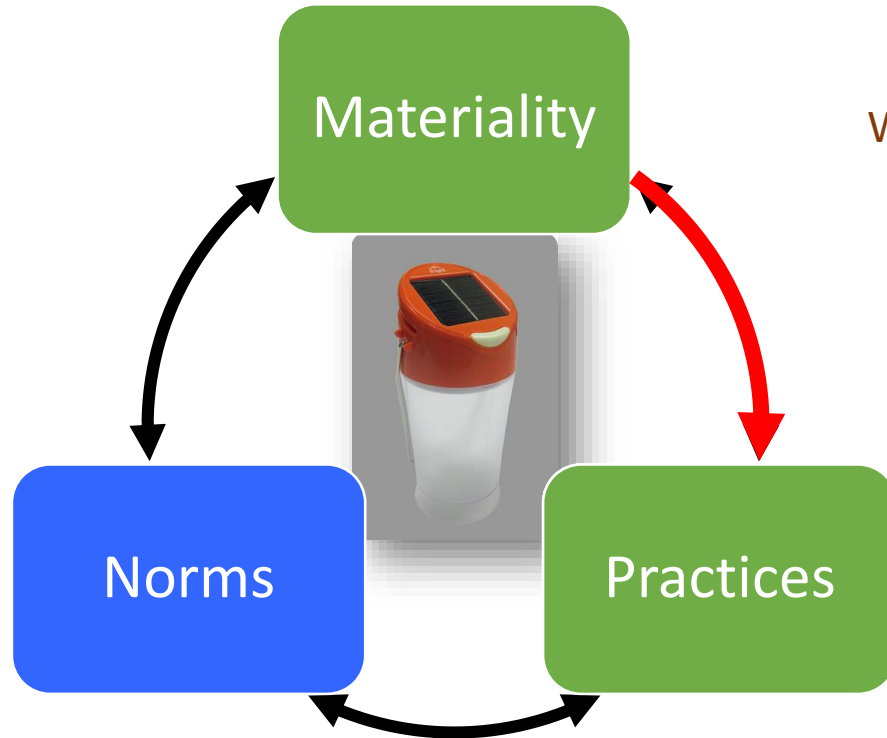
# Lighting in Vanuatu



# Australian Aid supply-side subsidy for NGOs



Solar lamps replace  
kerosene lamps



Women & children using lamps

New evening practices  
e.g. Womens weaving;  
children's homework

Supporting social  
interactions, fishing,  
etc at night

Less need to engage  
in cash economy





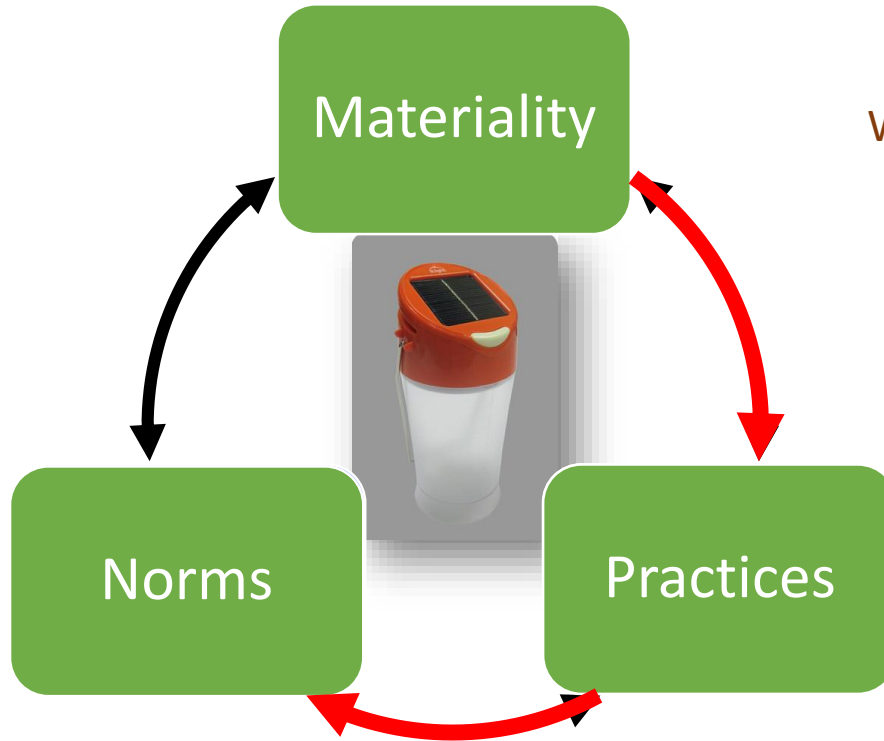


Light is for everyone

Sunlight is from God

“Free” energy

Aversion to kerosene



Women & children using lamps

New evening practices  
e.g. Womens weaving;  
children’s homework

Supporting social  
interactions, fishing,  
etc at night

Less need to engage  
in cash economy







Solar panels,  
phones, chargers



Women & children using lamps



Aspirations for  
more solar

Light is for everyone

Sunlight is from God

“Free” energy

Aversion to kerosene

Materiality



Norms

Practices

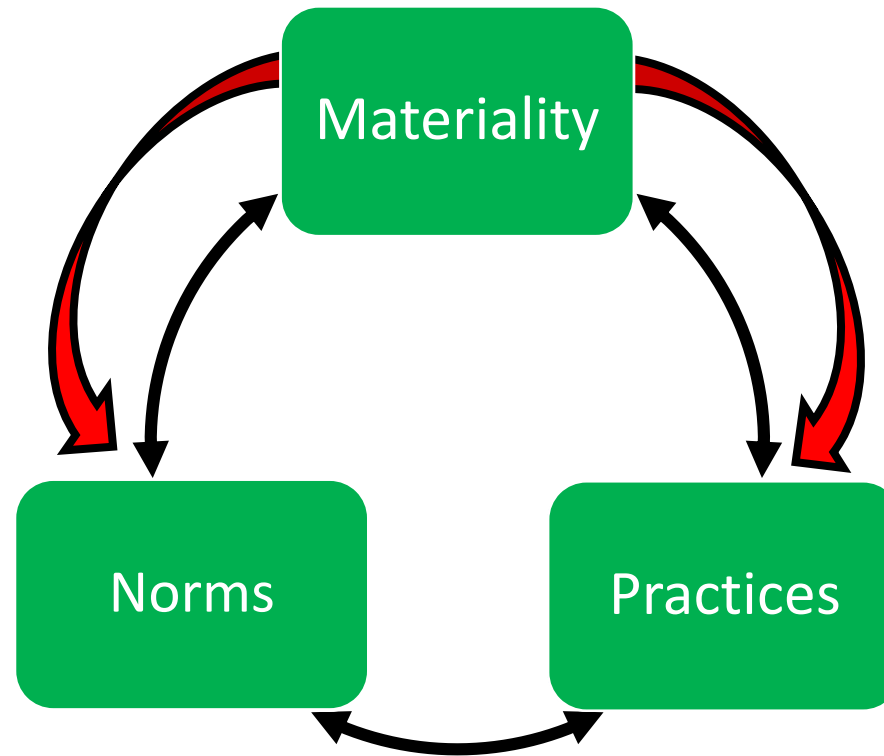
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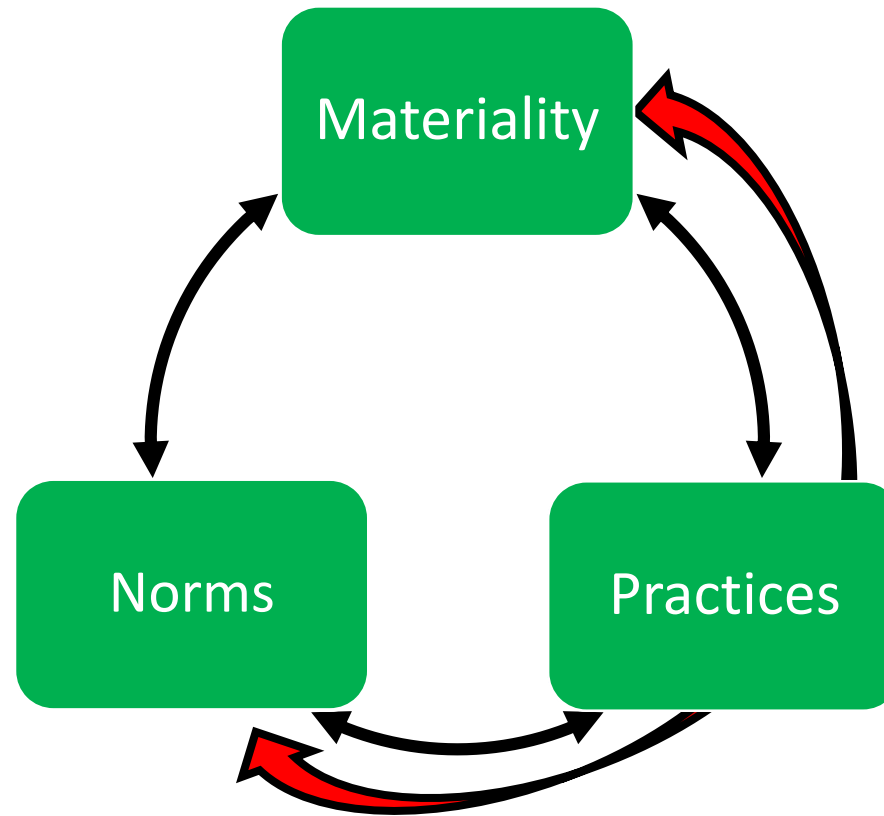
Less need to engage  
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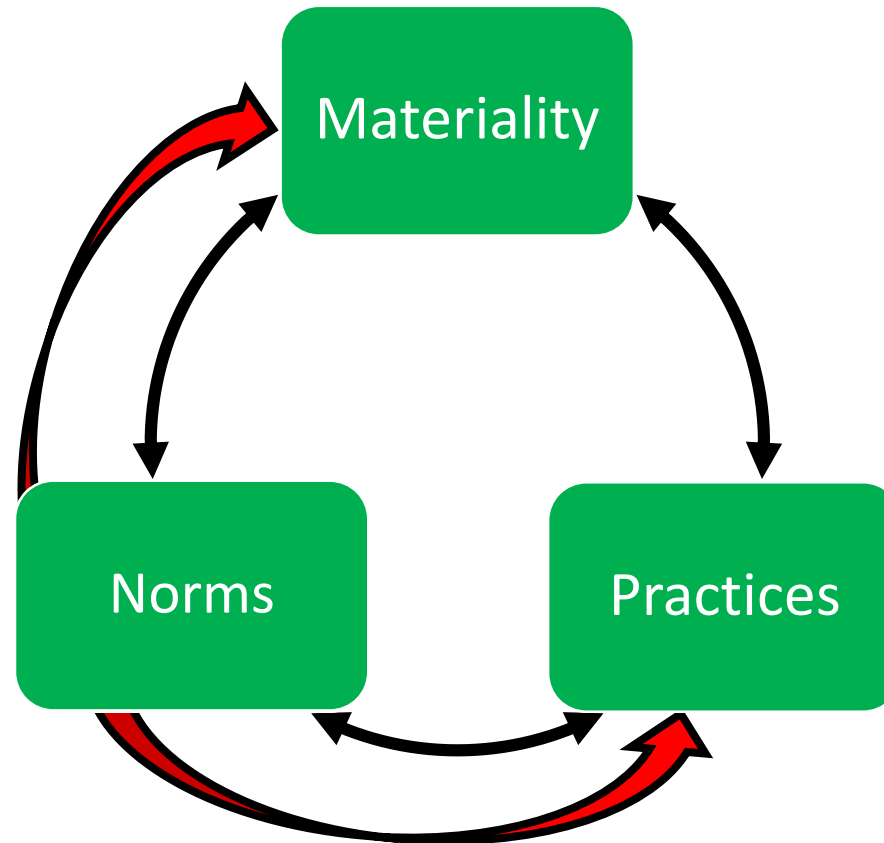
# Business energy efficiency - internal trigger points: More efficient technology



# Business energy efficiency - internal trigger points: Lean manufacturing – efficient practices

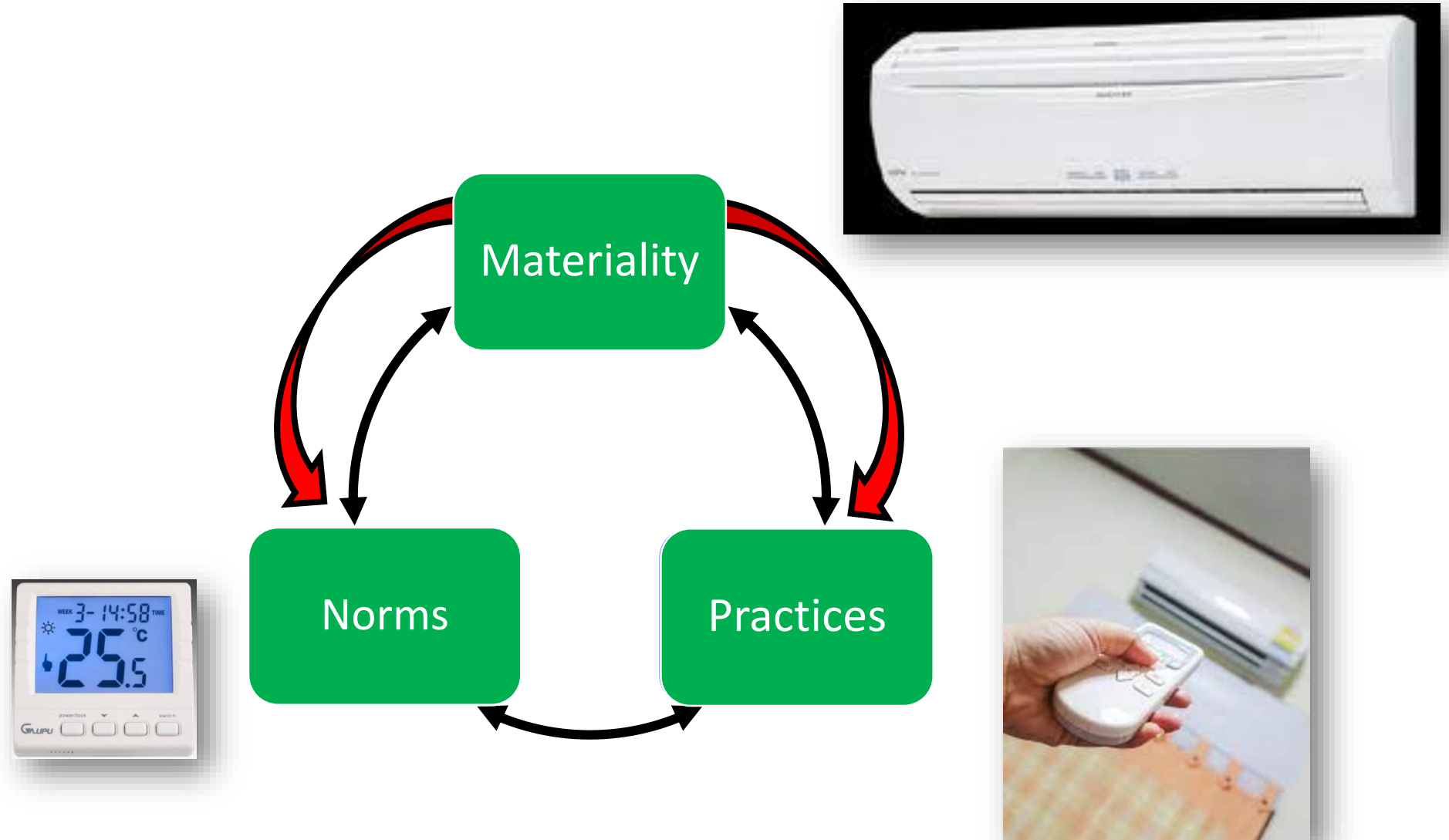


# Business energy efficiency - internal trigger points: Reset business strategy – new aspirations

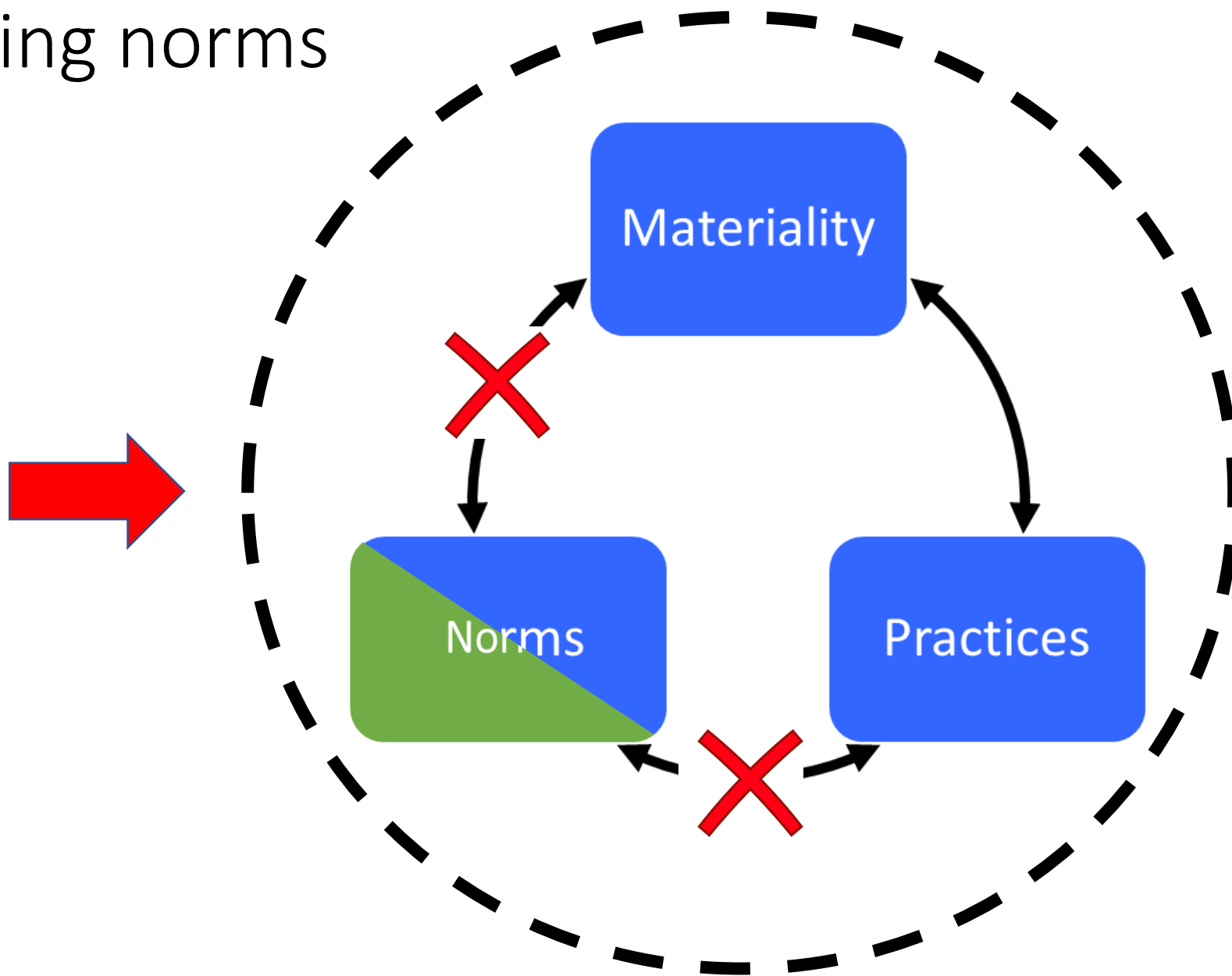




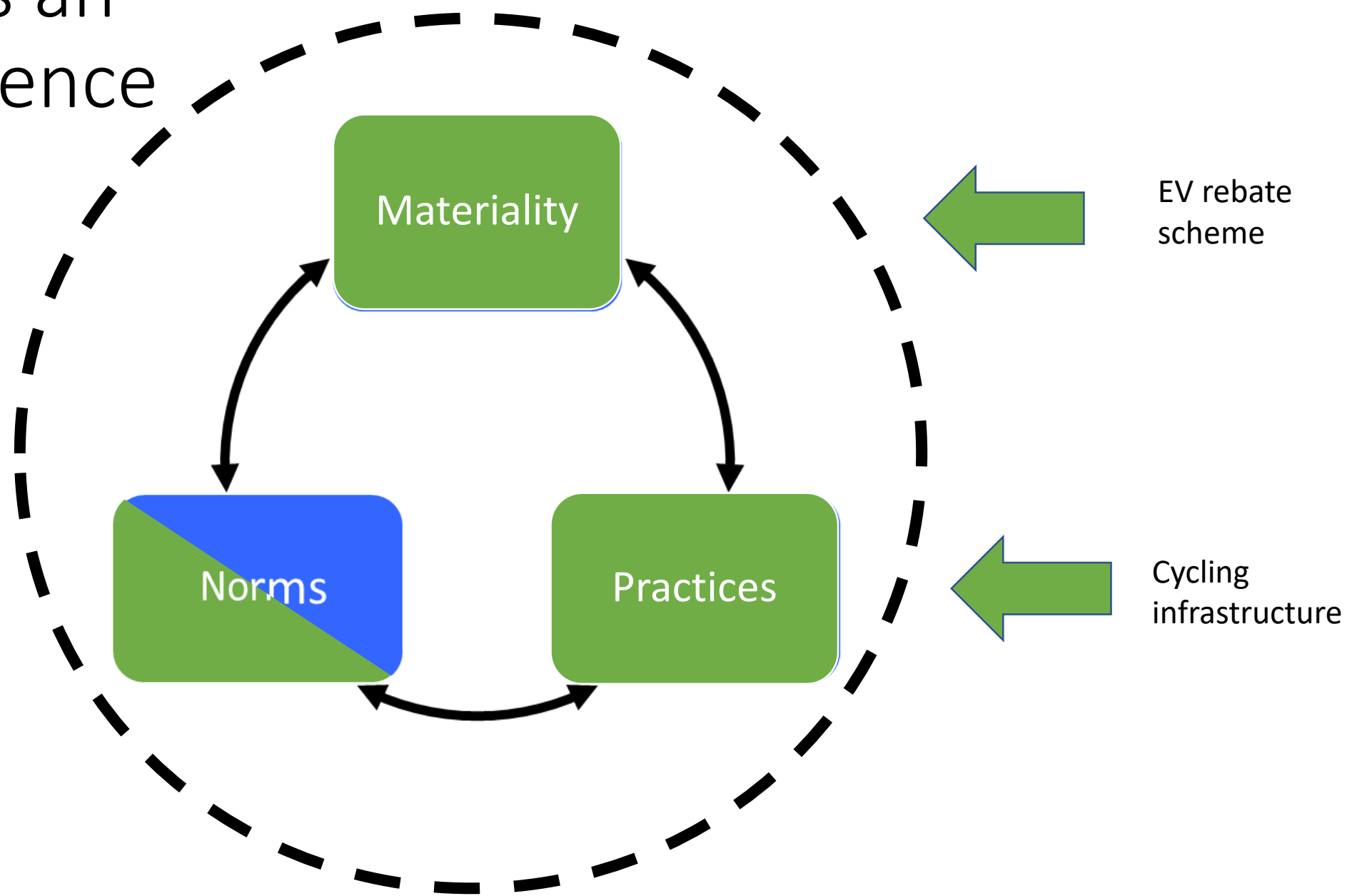
# “Rebound effect”



Conflicting norms



# New policy as an external influence



Materiality

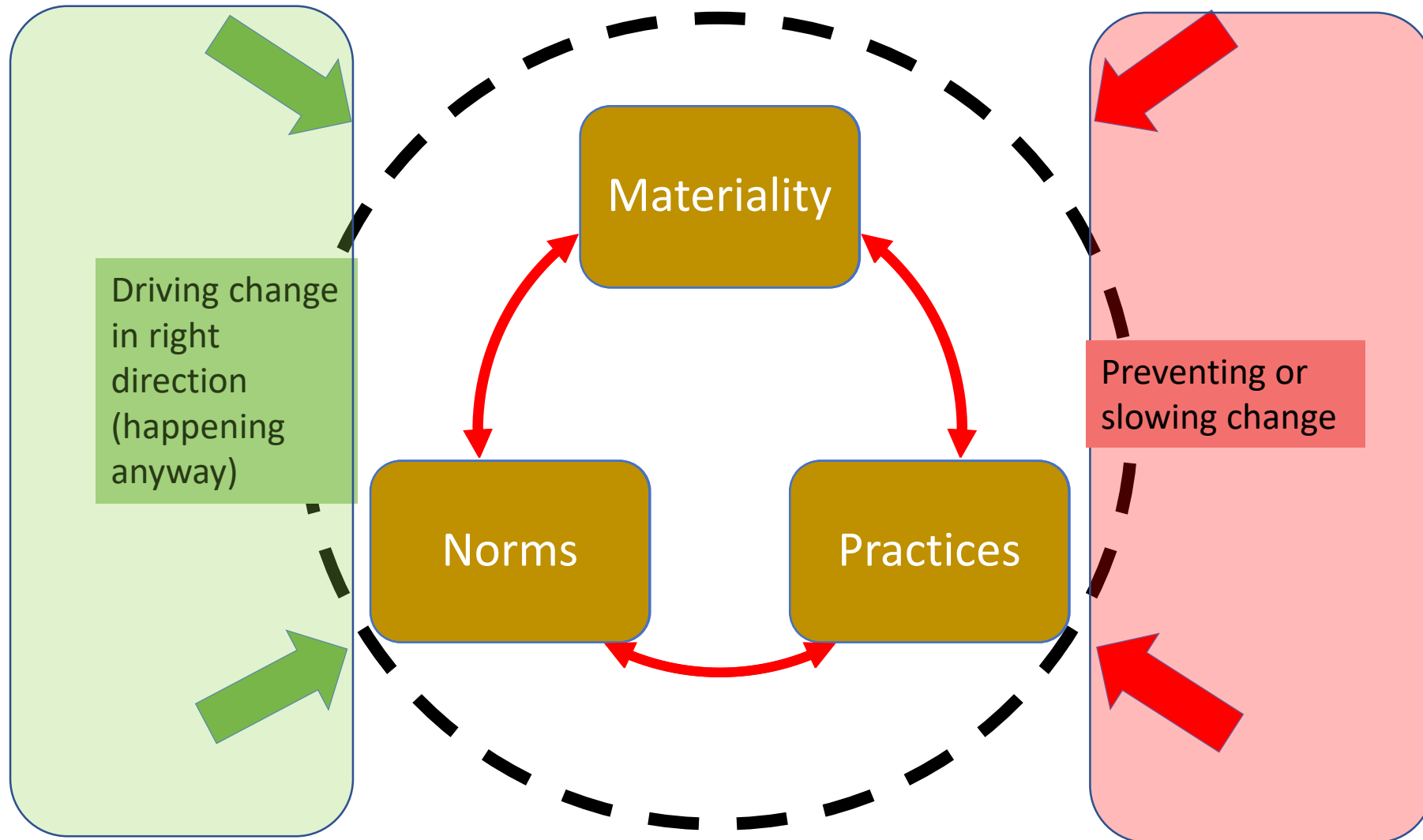
Norms

Practices

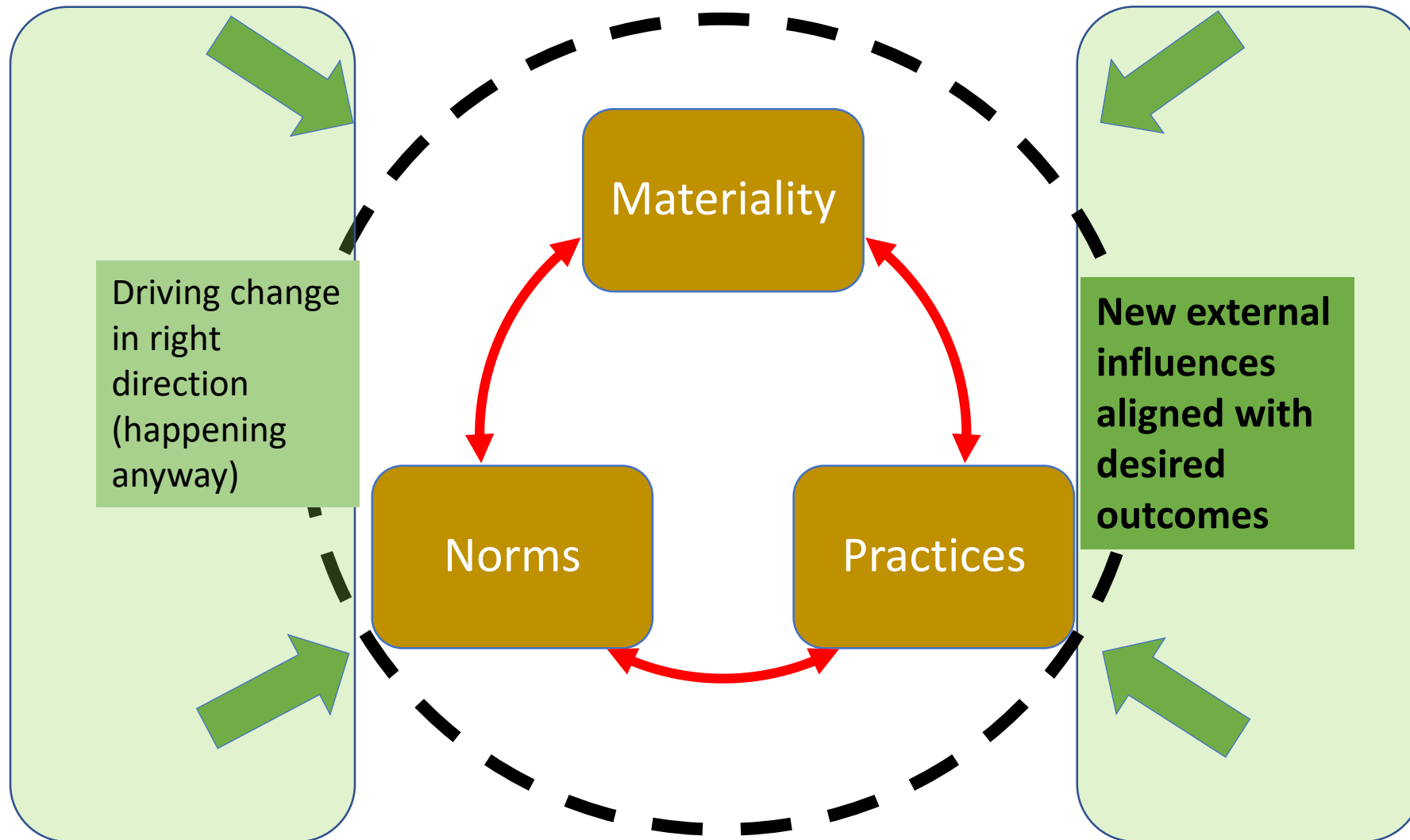
EV rebate scheme

Cycling infrastructure

# Policy analysis: What are the external influences driving and constraining change?



# Policy analysis: What are the external influences driving and constraining change?





## 2. HOME ENERGY ADVICE

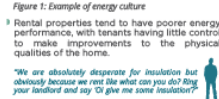
Helping households improve efficiency, warmth and comfort

### WHY IS THIS IMPORTANT?

- Much of New Zealand's housing stock, particularly older houses, is of low thermal quality. Cold, damp houses are expensive to heat and can also be harmful to occupants' health and wellbeing.
- Householders can improve the efficiency, warmth and comfort of their homes by implementing simple inexpensive changes in everyday practices through to major investments.
- Many households have changed their energy practices through to major investments.

### Our research shows:

- People are often locked into unhealthy energy cultures, which can be difficult to change.
- Figure 1 portrays the energy culture of an older person living in a colder part of New Zealand, showing how norms, material culture and practices reinforce each other.



Rental properties tend to have poorer energy performance, with tenants having little control to make improvements to the physical qualities of the home.

"We are absolutely desperate for insulation but obviously because we rent the what can you do? Ring your landlord and say 'Oh give me some insulation!'"

As a result, people in rental properties often adopt very frugal energy practices. Cutting down on heating may have implications for their health and wellbeing.

Issues to look with rental housing quality are discussed in the policy brief on Fuel Poverty.

6.3% spent more than 10% on fuel went without power at least once

- This group had:
  - Lowest income per capita
  - More solo parent families and elderly
  - Spent more time at home (nearly 20 hours/day)
  - Older houses, and more likely to be renting
  - Homes less likely to be insulated

Very economical heating low-puff clothes in cold water driers, dish washers

Aspire to reduce a money, or to increase This is the most vulnerable circumstances reduce expenditure poor energy efficiency tenants they have the highest priority

However, it does not radically change a firm's operating systems.

It does not necessarily develop new strategic capabilities and competencies.

Other insights

For energy eco-innovation to become a strategic capability, businesses need to align all aspects of their energy culture - strategic intent, aspirations, values, practices and technologies, along with knowledge development to underpin ongoing innovation.

Eco-innovation change must involve a whole-of-business alteration in energy culture, as opposed to an isolated incident, for sustained competitive advantage to result.

## 3. FUEL POVERTY

Households in fuel poverty - the need to improve living standards

### WHY IS THIS IMPORTANT?

- Much of New Zealand's older housing stock has poor energy performance. When people live in inefficient, cold, damp homes, it costs more to stay warm and dry than in an efficient home. They are also more likely to suffer health impacts.
- People on lower incomes can face relatively high costs to stay warm and dry, or suffer low temperatures, discomfort and sometimes ill effects if they don't spend at this level.
- Energy Cultures research interviewed householders who experienced fuel poverty (McIntyre et al., 2016). Results show that fuel poverty affects people's participation in society and their quality of life. Quotes in this brief are from this study.

"It's very cold and damp in this house... you can actually feel the draught coming in a tickle of heat to warm up this house... even when sometimes it feels like an ice - Single father

"We are absolutely desperate for insulation but obviously because we rent the what can you do? Ring your landlord and say 'Oh give me some insulation!'"

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## 5. ECO-INNOVATION

Developing strategic capability in businesses through energy eco-innovation

### WHY IS THIS IMPORTANT?

- Businesses are under increasing pressure to think strategically about the sustainability of their production and consumption processes.
- Eco-innovation is the development and application of business models that incorporate sustainability throughout all parts of the business.
- By implementing eco-innovations, businesses can enhance their environmental performance and help build a resource-efficient economy.
- Eco-innovations can also increase the strategic capability of SMEs by transforming environmental challenges into new market opportunities.
- Strategic capability is the ability of a business to use competitive strategies that allow it to survive and increase its value over time.

"We feel deprived and you can't do anything... you are constantly going without... either it's without power or without food... and you are always cold."

As a result, people in rental properties often adopt very frugal energy practices. Cutting down on heating may have implications for their health and wellbeing.

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## 6. ELECTRIC VEHICLES

Promoting Electric Vehicles: Insights and Implications

### WHY IS THIS IMPORTANT?

- New Zealand's (NZ) road transport fleet is mid-range in efficiency compared to the rest of the OECD, and contributes 46% of NZ's energy-related greenhouse gas (GHG) emissions.
- Increasing the number of energy-efficient vehicles in the fleet is important to improve productivity and reduce emissions.
- Electric vehicles (EVs) are a highly efficient alternative to conventional internal combustion engine vehicles (ICVs). About 80% of NZ's electricity is generated from renewable sources with minimal GHG emissions. Co-benefits include energy security and reductions in air pollution and noise.
- Energy security derives from switching from petrol or diesel to electricity, a 'home-made' fuel that is priced in NZ dollars.
- The NZ government has set a target of doubling the number of EVs every year to reach 64,000 by 2021, about 2% of New Zealand's current light vehicle fleet. This may be hard to achieve without strong supportive policy environment. Public policy is a key driver that influences the uptake of EVs.
- The current policy package on EVs, 'Electric Vehicles: Driving an EV Future', is relatively modest by international EV policy standards.

"We examined New Zealanders' interest in EVs and reviewed international policies to identify the characteristics of measures that would suit New Zealand."

A good fit with Kiwi mobility culture?

EVs are well aligned with some aspects of Kiwi's material culture, practices and norms:

- 80% of homes have off-street parking so EVs can be charged at home
- 60% of households have a car

Alignment of Kiwi mobility culture with EVs

As a result, people in rental properties often adopt very frugal energy practices. Cutting down on heating may have implications for their health and wellbeing.

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## 8. URBAN FREIGHT

Improving energy efficiency and emissions

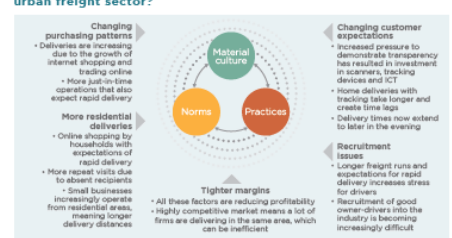
### WHY IS THIS IMPORTANT?

- Freight movements nationally are predicted to increase by around 60% by 2042.
- Urban freight movements have a disproportionate impact on urban traffic movements, quality and energy use due to most movements occurring in relatively congested areas.
- Urban freight movements are increasing due to more just-in-time deliveries to businesses, deliveries of online shopping to households, and returns of products bought online.
- Increasing demand for freight nationally is contributing to greenhouse gas emissions.
- Actions such as switching fuels, the adoption of efficient driving behaviours and the uptake of more efficient vehicles may offset some of the projected growth in freight emissions and increase energy efficiency.

### OUR RESEARCH

- The characteristics of the urban freight sector are not well understood.
- We set out to understand the 'mobility cultures' of urban freight businesses, external influences that are shaping that culture, and their perceptions of the future.
- We conducted 25 semi-structured interviews with freight managers and drivers in four New Zealand cities.

What external influences are changing the energy culture of the urban freight sector?



Together these influences are tending to increase urban freight movements, increase road congestion, and reduce profitability in the sector.

## 9. GENERATION Y

A youth-led transition? Supporting more widespread use of multi-modal transport

### WHY IS THIS IMPORTANT?

- Compared to earlier generations, many young people born between 1980 and 2000 (Generation Y) are becoming less dependent on private cars.
- This trend is occurring in many developed nations as well as in New Zealand.
- In NZ, the distance driven per day for people aged 25-34 has been generally trending downwards since the 1990s. They spend less time as car drivers than older age groups of the working population, and the percentage with a full licence has fallen since the early 2000s.
- Similar trends are seen in 15-25 year olds although it is unclear whether this is partly due to changes in the licensing regime!
- Our research shows that many of these young people are instead using multiple travel modes such as active transport, public transport and shared transport.
- There are many co-benefits of multi-modal transport including improved health and reduced greenhouse gas and particulate emissions.
- If these positive trends are not supported, Gen Y members are likely to revert to high levels of car ownership and use as they move through different life stages.
- Policy should support the emerging culture of multi-modality amongst Generation Y, and encourage more widespread uptake across the population, while addressing any negative repercussions.

### TWO DIFFERENT MOBILITY CULTURES

Our research shows that many influences, both personal and external, are involved in young people adopting multi-modal mobility. We have shown the main influences below:



Other combinations of influences mean many young people remain largely car-dependent.

External influences: POLICY - Policy and funding support for active and public transport

External influences: SOCIAL - Social norms of multi-modality

External influences: POLICY - Policy and funding support for active and public transport

External influences: SOCIAL - Social norms of car ownership and use

External influences: POLICY - Policy and funding support for active and public transport

External influences: SOCIAL - Social norms of car ownership and use

## 10. TRANSPORT

Interventions for a sustainable transport future

### WHY IS THIS IMPORTANT?

- New Zealand's current transport system is dominated by relatively inefficient motor vehicles that use fossil fuels. Negative outcomes include health issues (particulate emissions, road safety, noise, sedentary living), economic costs (e.g. of congestion), and being a significant contributor to New Zealand's greenhouse gas emissions.
- There are many cost-effective options for low-emissions transport, including alternative modes of travel such as walking, cycling, public transport and shared vehicles.
- Poorer communities tend to be less well served with active and public transport options, giving them little choice but to rely on cars.

How should New Zealand's transport system evolve to sustain a healthy economy, environment and society?

### OUR RESEARCH

We undertook a 4-stage Delphi study involving 88 New Zealand transport experts.

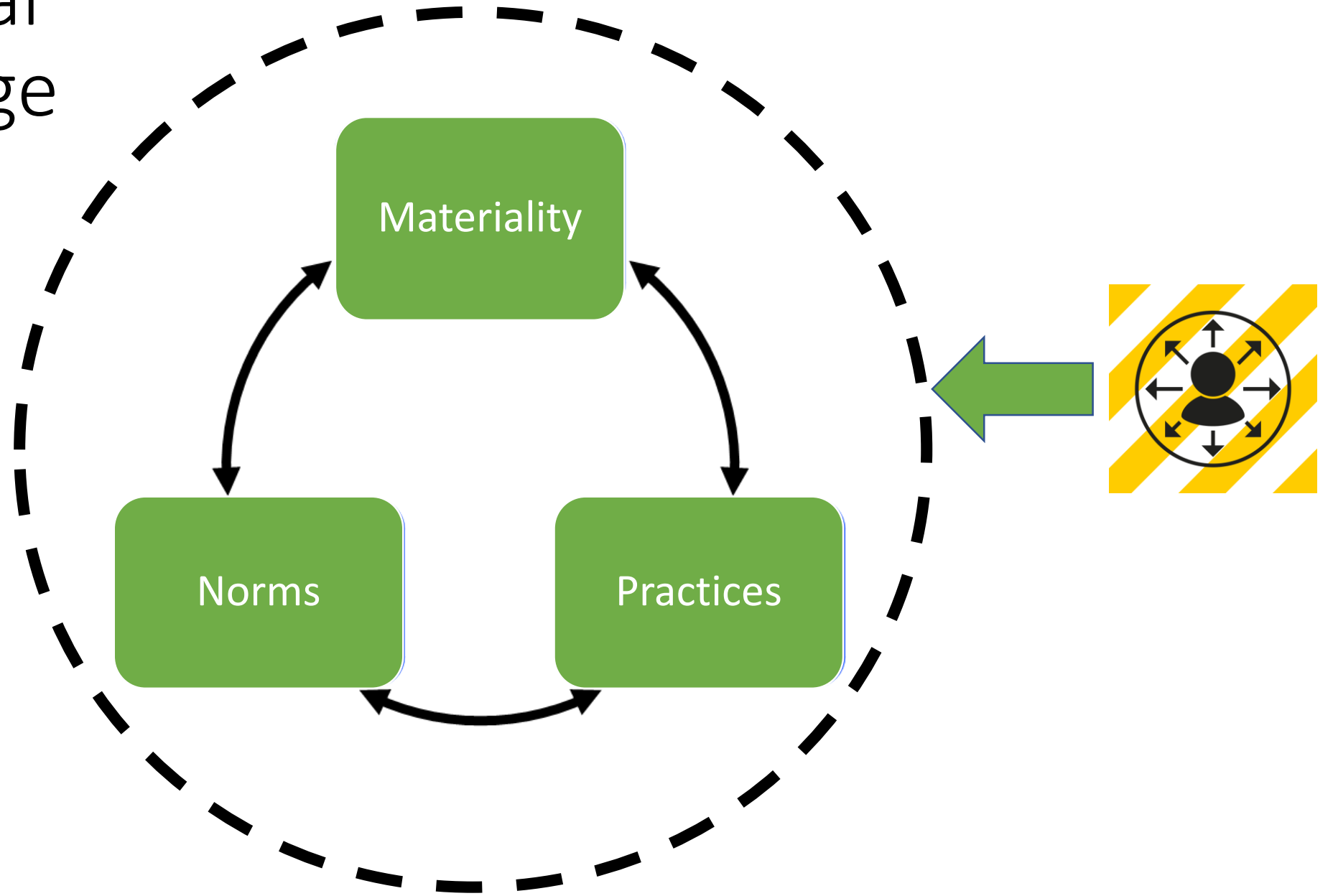
### Key findings

- The transport system is likely to face significant future challenges such as technology developments, volatile oil prices, and the need to radically reduce greenhouse gas emissions.
- There was a high level of agreement (80% or more) amongst the experts that a sustainable transport system for New Zealand would need to have the following features:
  - A collective, cross-party vision of NZ's future transport
  - Urban form and functioning reducing the need to travel
  - Integrated multi-modal transport systems in urban areas with over 100,000 people
  - Cross-modal ticketing systems for public transport
  - A range of mobility options for different length trips
  - Rural areas having access to information communication technologies to support travel substitution
  - Widespread understanding of the full cost (including externalities) of car ownership so that all transport modes are on a level playing field

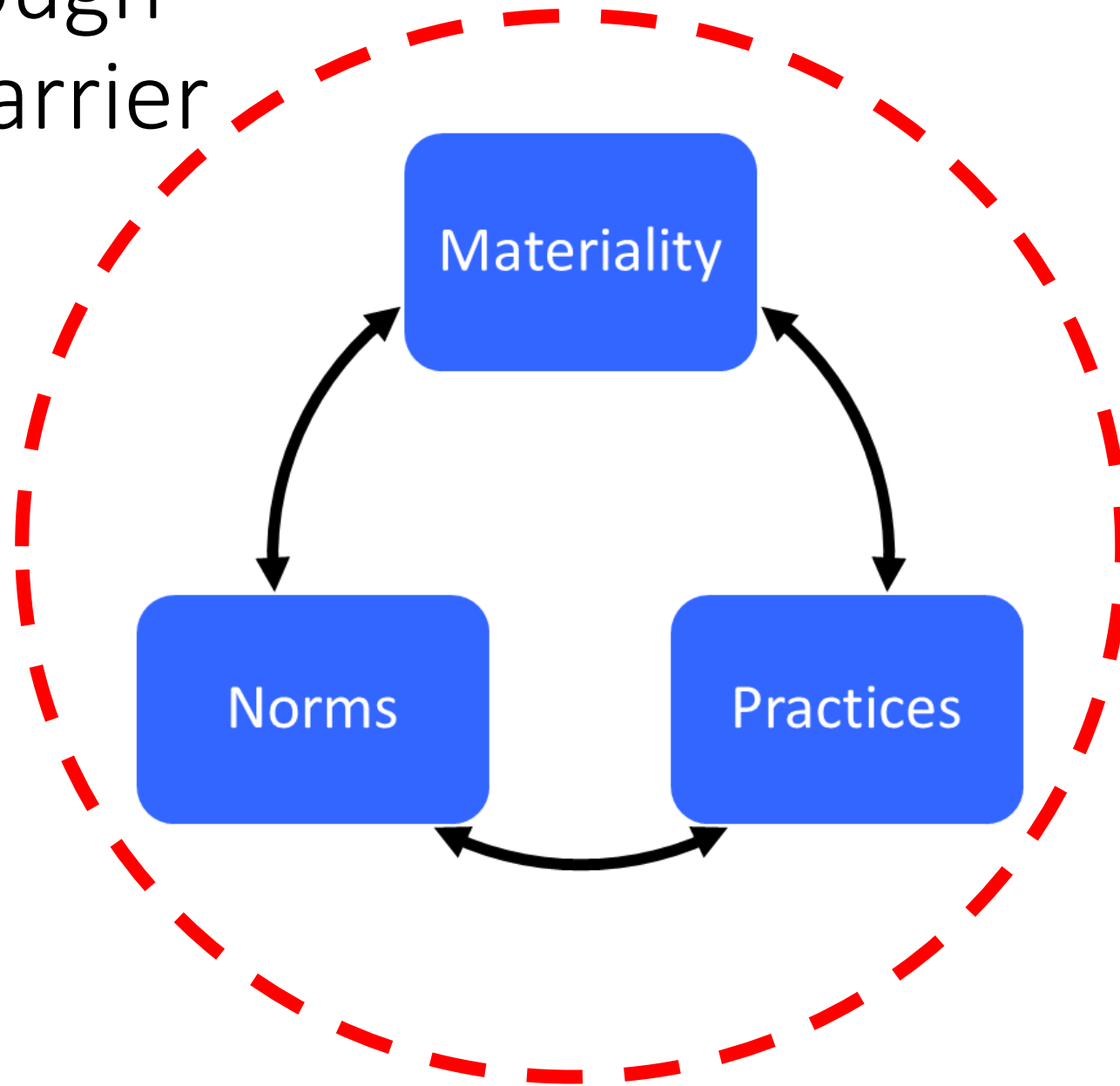
How should NZ respond to these challenges and achieve a transport system that enables NZ to thrive?

- The experts considered that interventions are needed to achieve:
  - A legal and structural shift in transport agencies to support investment in sustainable transport
  - Legislation and policies that prioritise sustainable transport across all laws that affect transport
  - A transport funding system that consistently reflects costs, benefits and long-term strategy
  - New options for transport revenue including congestion charging, road pricing, and the health budget (for active travel)

# Circumstantial culture change



Breaking through  
the agency barrier



# External influences discouraging PV uptake

**Government:** No feed-in tariff or other PV subsidies

**Smart Grid Forum:** PV marginal cost greater than wind; variability problematic

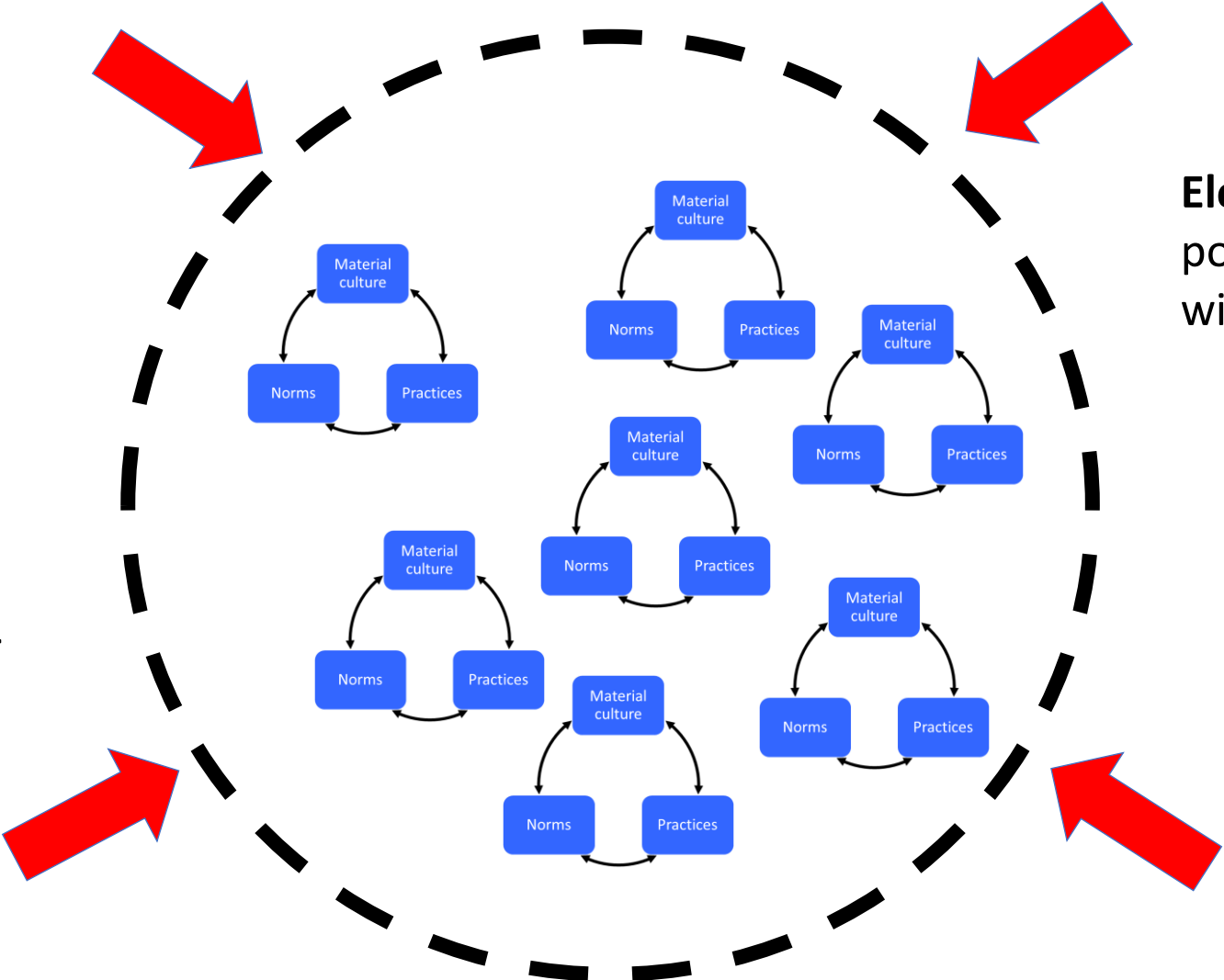
**Lines company:** 'solar tax' – an extra lines charge to customers who install PV

**Retailers:** very low buy-back rates

**Electricity Authority:** poorer consumers will pay more

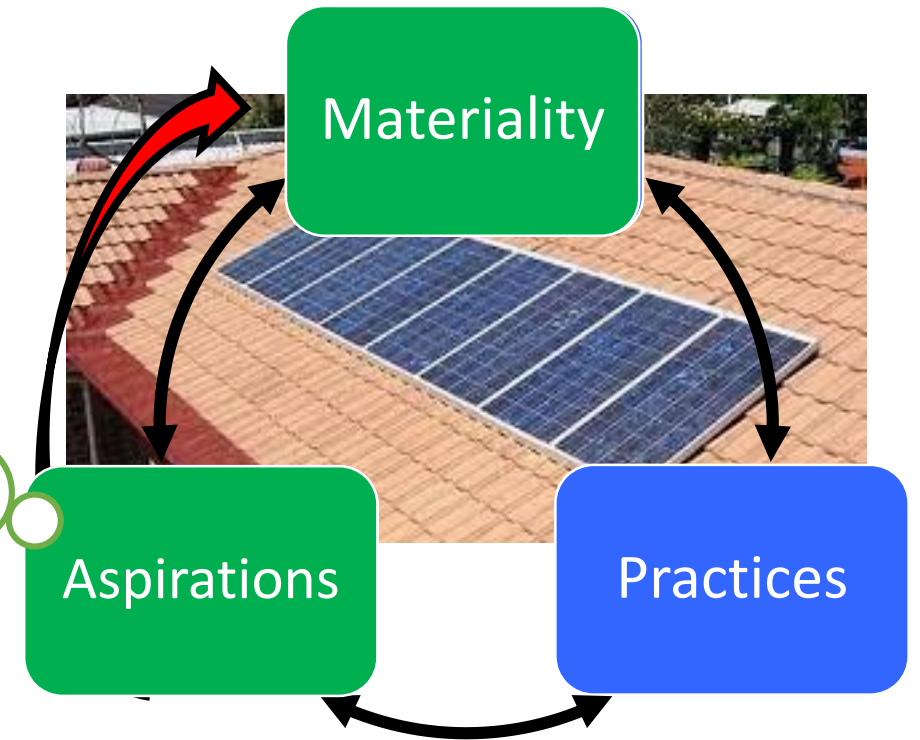
**Parliamentary Commissioner for the Environment:** does not reduce GHGs

**Energy Efficiency and Conservation Authority:** buy an EV not PV



# Aspirations driving PV uptake

Desire for independence  
Lack trust in electricity companies  
Greater financial control  
Environmental concern  
Perceived resilience  
Cost equivalence less important





# Collective culture change driving disruption



**New businesses**

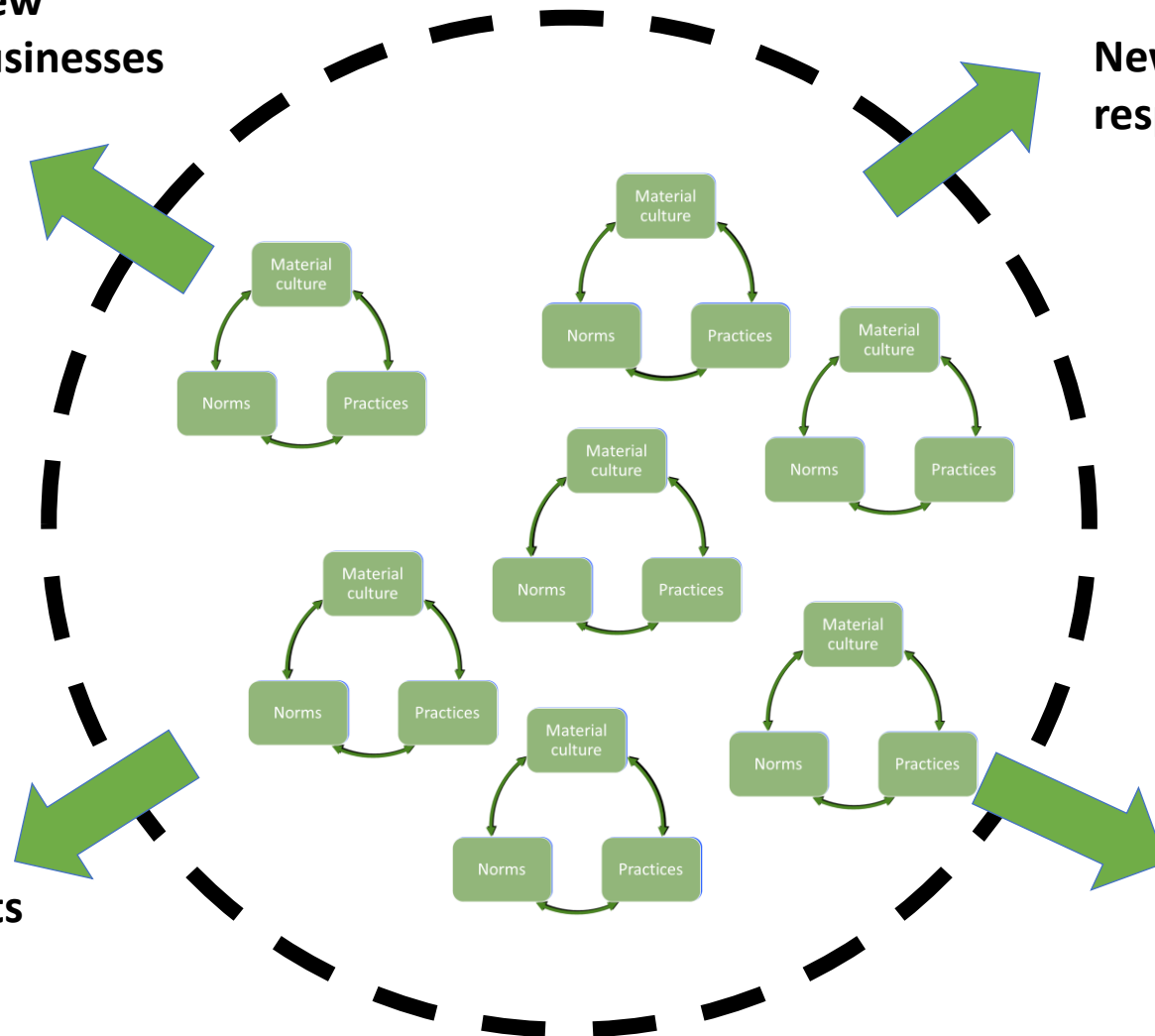


**New policy responses**

**Our Energy Limited**  
Clean, local energy



**New markets**



**New actors and locales of power generation and optimisation**

# Divestment

**SCOOP** Sci-Tech Search Scoop

Front Page Scoops Parliament Politics Regional Business **Sci-Tech** World

## Uni of Otago Foundation Trust Divests from Fossil Fuel

Wednesday, 15 July 2015, 4:23 pm  
Press Release: [OtagoUniDivests](#)

University of Otago Foundation Trust Divests from Fossil Fuel Exploration and Extraction

Scoop News 15 July 2015  
<https://www.scoop.co.nz/stories/SC1507/S00045/uni-of-otago-foundation-trust-divests-from-fossil-fuel.htm>

## The database of fossil fuel divestment commitments made by institutions worldwide

[VIEW DATABASE](#)



<b>\$40.57 TRILLION</b> <small>Approximate value of institutions divesting.</small>	<b>1546</b> <small>Institutions Divesting</small>
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GoFossilFree.org 9 Sept 2022  
<https://gofossilfree.org/divestment/commitments/#>

# Keep it in the ground



Wikipedia 20 June 2016

[https://en.wikipedia.org/wiki/File:Keep\\_it\\_in\\_the\\_Ground.\\_protect\\_Mother\\_Earth.jpg](https://en.wikipedia.org/wiki/File:Keep_it_in_the_Ground._protect_Mother_Earth.jpg)

## No new oil, gas or coal development if world is to reach net zero by 2050, says world energy body

**Governments must close gap between net zero rhetoric and reality, says International Energy Agency head**

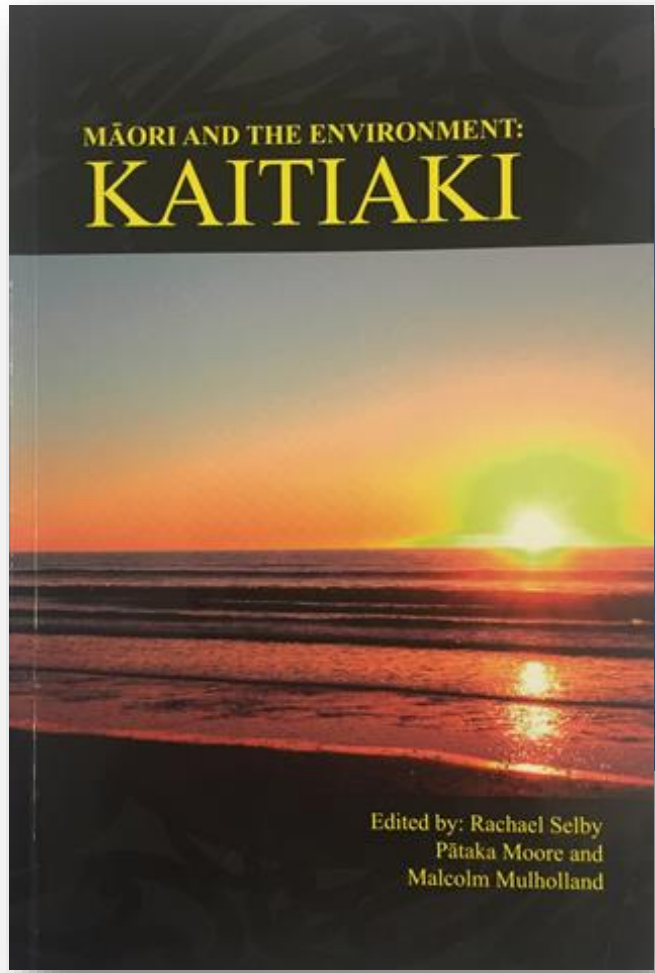


Guardian 18 May 2021

<https://www.theguardian.com/environment/2021/may/18/no-new-investment-in-fossil-fuels-demands-top-energy-economist>



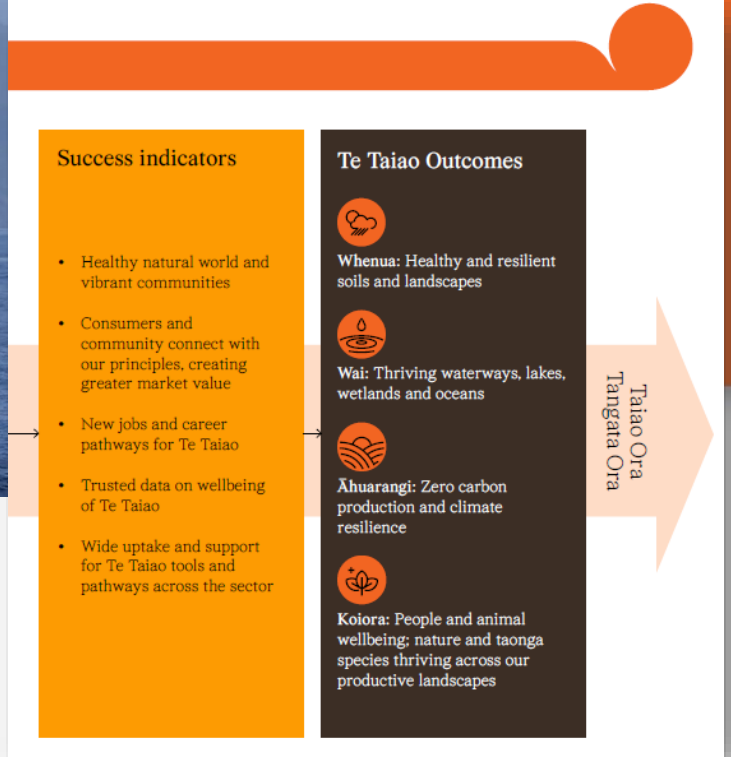
# Learning from Indigenous worldviews



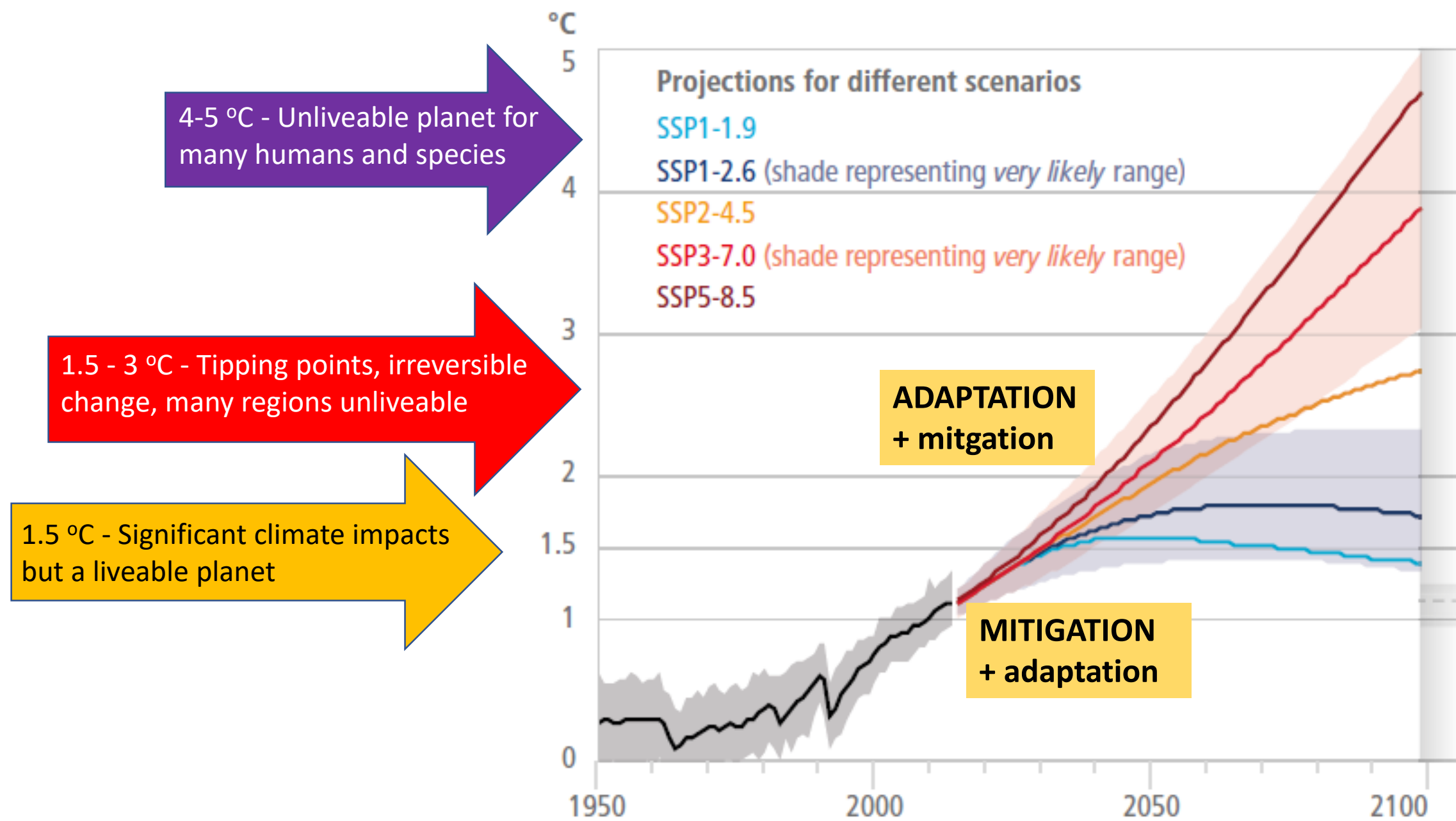
Selby, Moore & Mulholland 2010



Whalewatch 2021



Primary Sector Council 2020



Global surface temperature change (relative to 1850-1900) under different GHG scenarios. IPCC Summary for Policymakers 2022



