How to build a Net Zero (and climate resilient) society

Toby Park, Global Head of Climate, Energy & Sustainability, BIT
toby.park@bi.team

THE
**BEHAVIOURAL
INSIGHTS
TEAM**

How to build a Net Zero society

Using behavioural insights to decarbonise home energy, transport, food, and material consumption

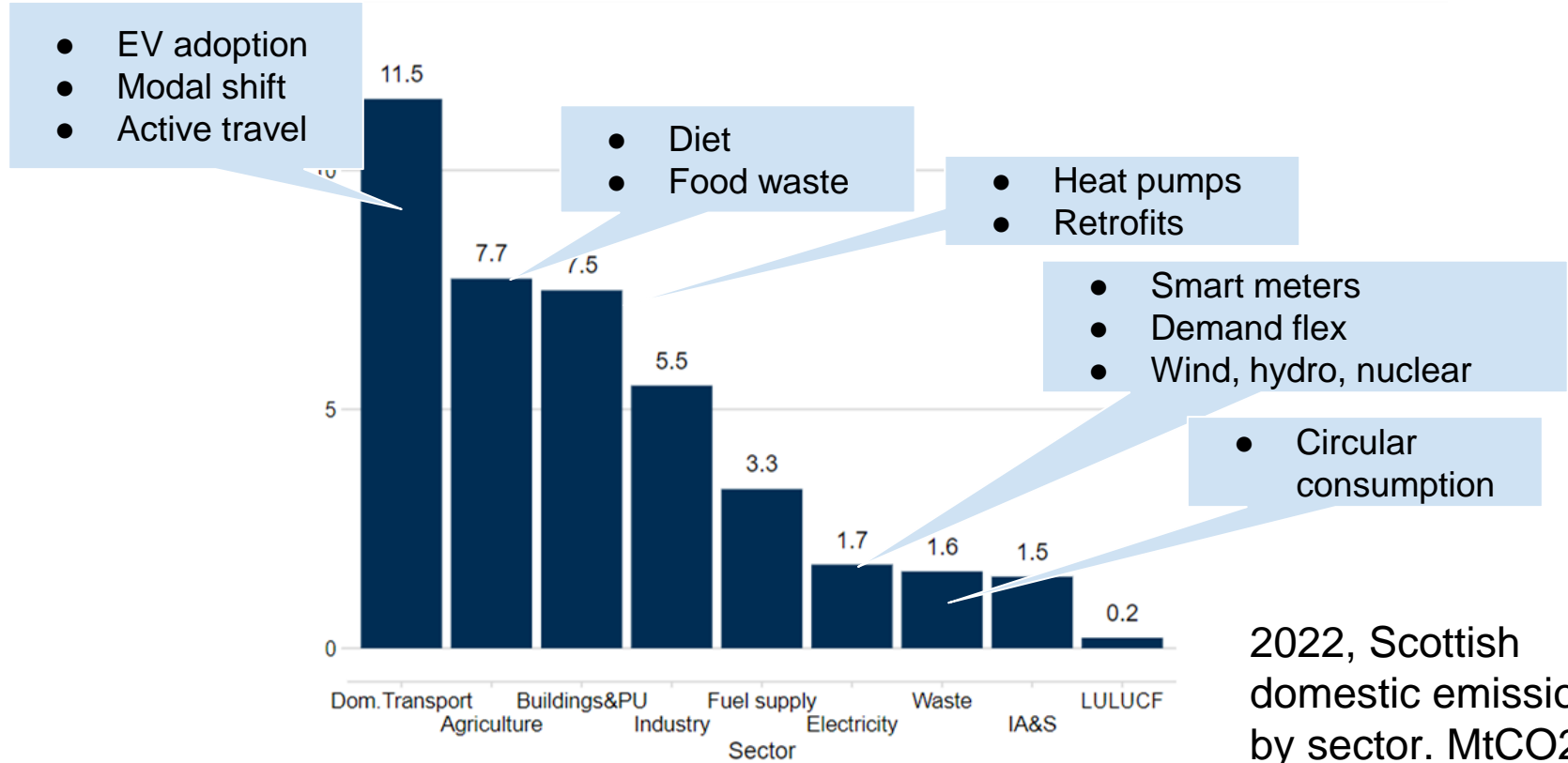A guide for policymakers and businesses

Lead Author: Toby Park
Contributing authors: Kristina Londakova, Izzy Brennan, Andrew Schein, Jake Reynolds, Ed Whincup, Edwin Chan, Marcos Pelenur, David Halpern
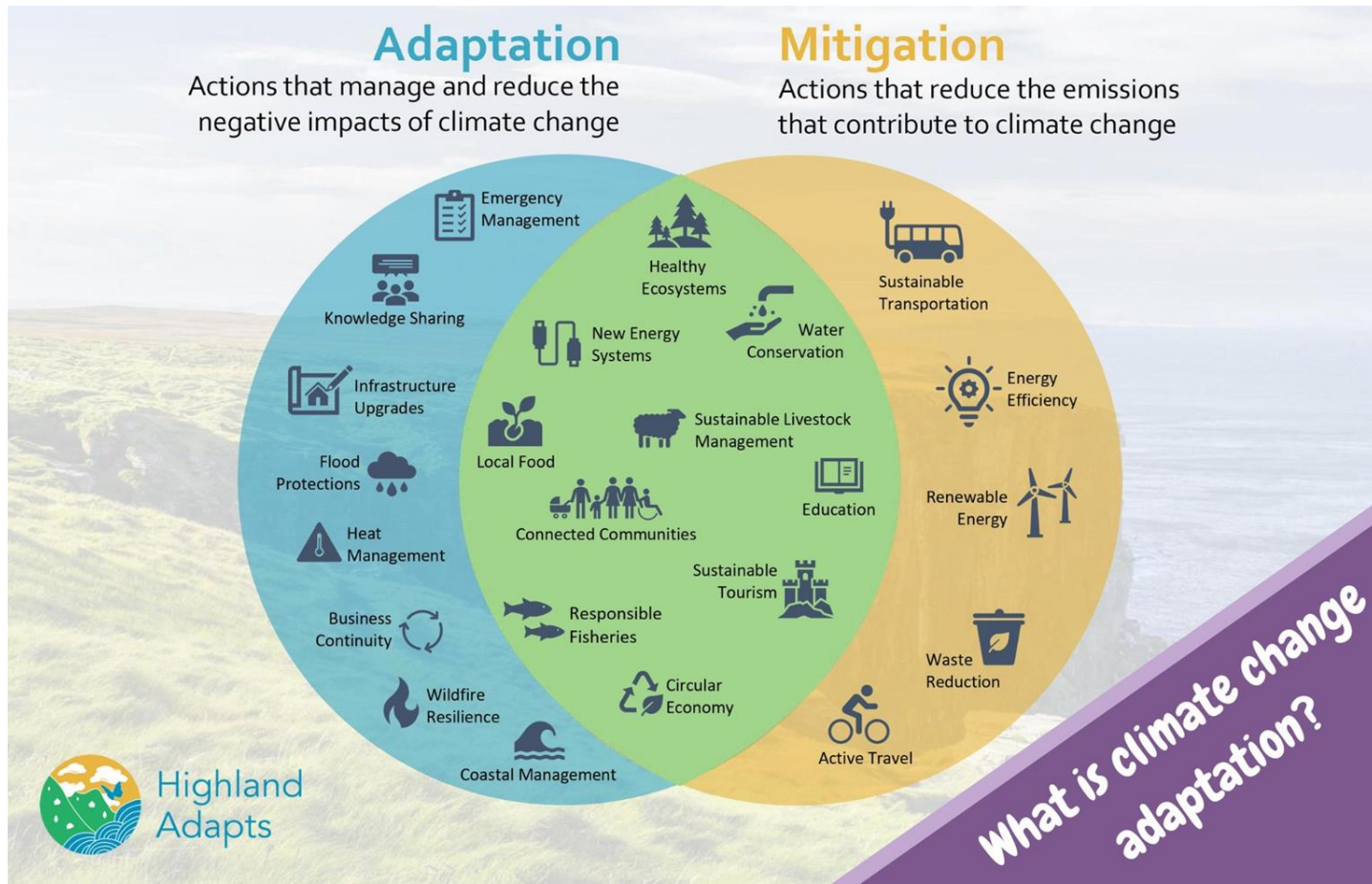
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We know that reaching Net zero heavily depends on widespread behaviour-change and public engagement

Curtailment behaviours
9.0%

Supply-side changes
38.0%

Low-carbon tech adoption
53.0%
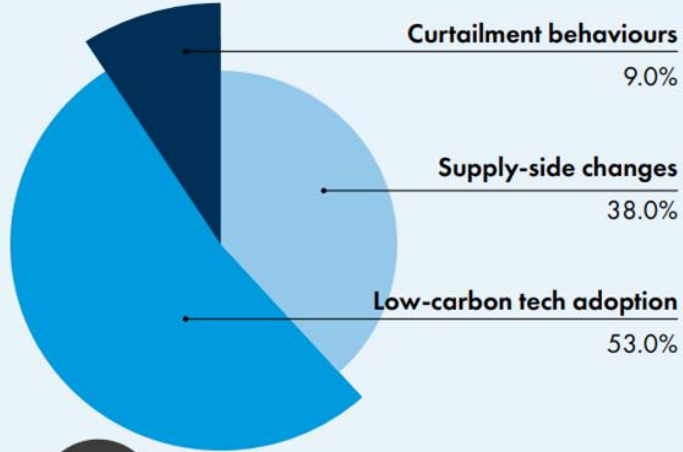
50% reduction since 1990, but **"The only sectors to reduce emissions in 2021 were electricity supply and industry…. The transport and buildings sectors will require a particularly rapid increase in the rate of emissions reduction to meet the targets set out in the last Climate Change Plan update (2020 CCPu)." (CCC)**

- EV adoption
- Modal shift
- Active travel

- Diet
- Food waste

- Heat pumps
- Retrofits

- Smart meters
- Demand flex
- Wind, hydro, nuclear

- Circular consumption

11.5
7.7
7.5
5.5
3.3
1.7
1.6
1.5
0.2

Dom.Transport
Agriculture
Buildings&PU
Industry
Fuel supply
Electricity
Waste
IA&S
LULUCF

Sector

2022, Scottish domestic emissions by sector. MtCO2e

Climate adaptation and resilience are just as 'behavioural'

Where are the public at?

The public do want a more sustainable society…

89% I would like to make more sustainable choices in my life if I could

88% It's often too hard to make more sustainable choices because of high costs, inconvenience, limited knowledge or other barriers

87% I wish leadership on the environment (from government and businesses) was stronger

87% I would like government and businesses to do more to help me make more sustainable choices (e.g. better information, stronger policy)

But big gaps remain…

1. We don't know what to do. Our survey data show a **negative** correlation (-0.37) between perceived and real climate impacts…

💡 Turning off lights > Heating efficiency 🌡️

🚲 Driving less > Switching to an EV 🔌🚗

🥤 Plastic packaging & food miles > Dietary choice 🥩

♻️ Recycling > Flying less, installing a heat pump, and everything else! ✈️

2. Myths, negative narratives and skepticism are widespread

Of the GB public….

… just

27%
said they understood what a heat pump was.

And familiarity with other low-carbon heating options was low: 18% were familiar with biomass boilers; 18% were familiar with hydrogen heating; 17% were familiar with district heat networks.

Green Action Belief and Misinformation Map: **Choosing heat pumps (and other low-carbon heating options)** *% who agree with the statement*	
"Installing a heat pump is more costly than installing a gas boiler"	**78**
"Heat pumps only work effectively in well insulated houses"	**76**
"Heat pumps are only suitable for modern or specifically designed homes"	**64**
"Heat pumps are noisy and often cause disturbance"	**50**
"The running cost of a heat pump is roughly the same as a gas boiler"	**49**
"Heat pumps cannot heat my home in very cold weather"	**45**
"The government currently offers significant financial support for anyone looking to install a heat pump in their home"	**43**
"Hydrogen heating systems are unsafe"	**36**

2. Myths, negative narratives and skepticism are widespread

Of the GB public….

60% understood **what an EV was**.

…just

23% were **familiar with Vehicle-to-Grid technology.**

Green Action Belief and Misinformation Map:
Engaging with EVs

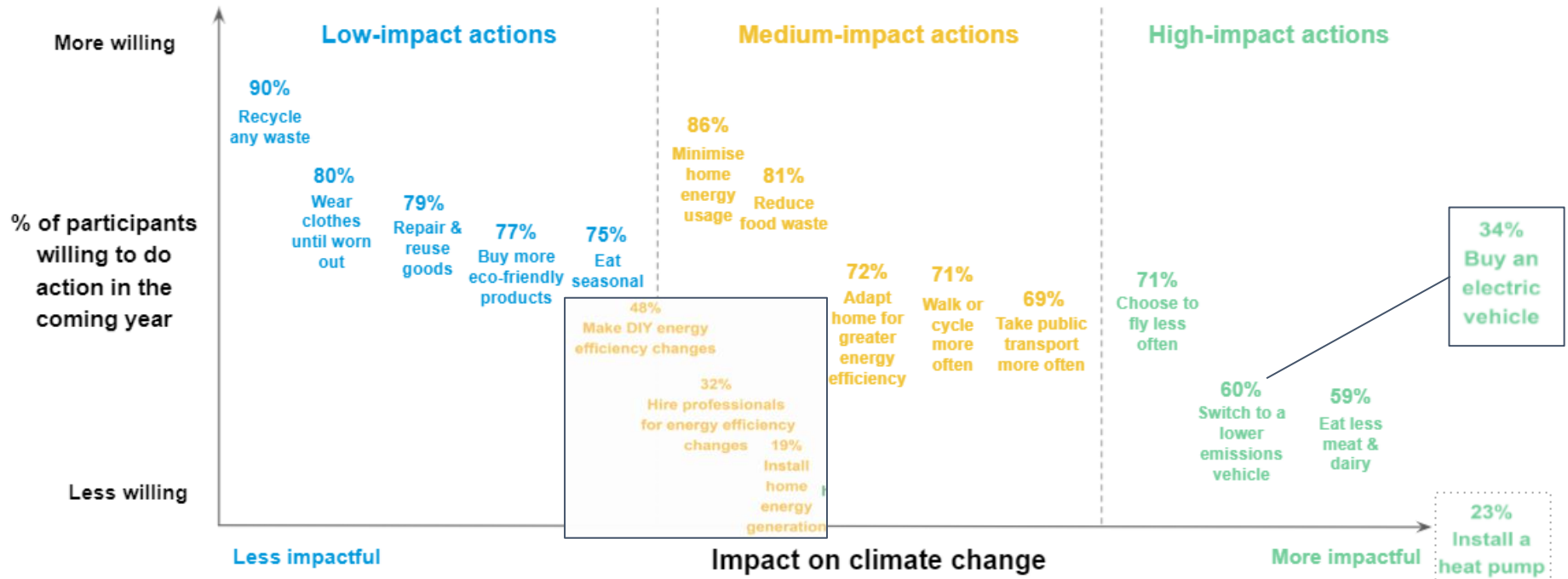| Statement	%
"EV batteries need to be replaced every few years"	75
"Over their lifetime, EVs tend to be better for the climate than petrol / diesel cars"	75
"EVs cannot travel long distances (more than 250 miles) on a single charge"	74
"Public charging stations are rare and inconvenient to use"	73
"Charging an EV is significantly cheaper (per mile) than refuelling a petrol / diesel car"	67
"EVs work out more expensive over their lifetime than traditional cars"	66
"EVs have a shorter lifespan than traditional petrol / diesel cars"	62
"EVs don't work well in cold weather"	45
"EVs are not as safe as traditional cars"	41
"EVs are less safe in accidents than traditional petrol/diesel cars"	41

3. We're *somewhat* willing to make the necessary changes… at least for the small things, in the abstract

…but favour low-impact actions which tend to be easier, cheaper, or bring more obvious co-benefits (e.g. financial savings). This data is also very sensitive to 'framing' (see boxes)

More willing

Low-impact actions   **Medium-impact actions**   **High-impact actions**

% of participants willing to do action in the coming year

90% Recycle any waste

80% Wear clothes until worn out

79% Repair & reuse goods

77% Buy more eco-friendly products

75% Eat seasonal

86% Minimise home energy usage

81% Reduce food waste

72% Adapt home for greater energy efficiency

71% Walk or cycle more often

69% Take public transport more often

71% Choose to fly less often

34% Buy an electric vehicle

48% Make DIY energy efficiency changes

32% Hire professionals for energy efficiency changes

19% Install home energy generation

60% Switch to a lower emissions vehicle

59% Eat less meat & dairy

23% Install a heat pump

Less willing

Less impactful   Impact on climate change   **More impactful**

Action items were presented to participants in random order with no indication of impact on climate change. Data collected by BIT on 8,007 UK adults on 17-30 June 2021.
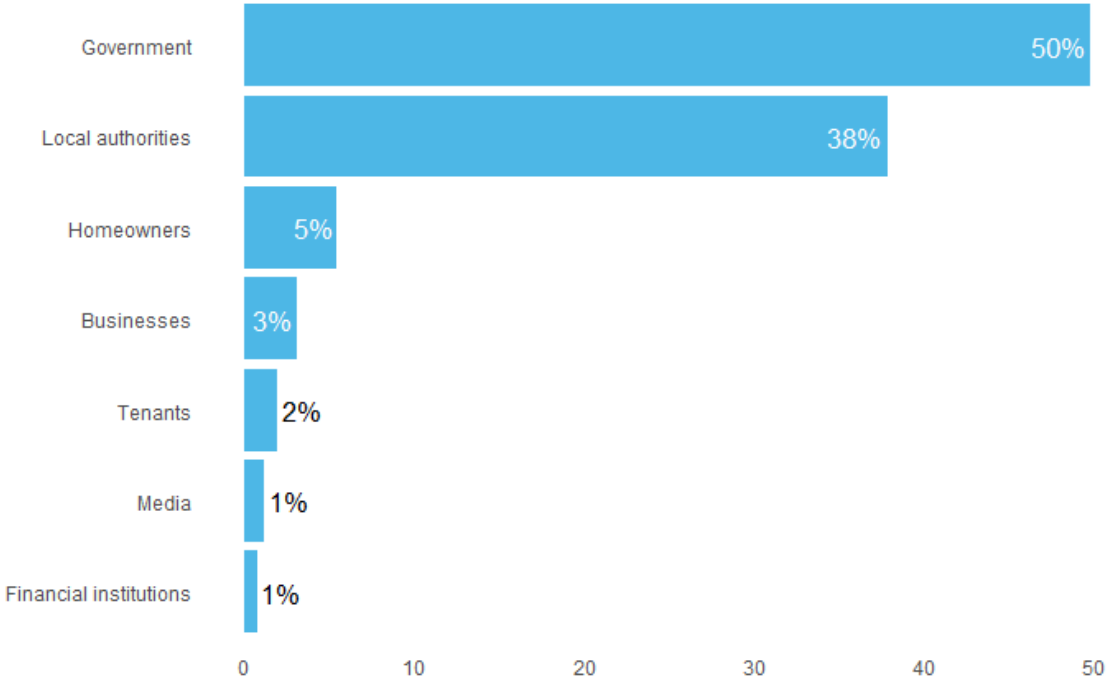
Getting a heat pump through planning doesn't need to be this hard

Many homeowners can install air source heat pumps without requiring planning permission, but when they do need planning permission, the complex, costly and lengthy process can be a barrier to heat pump adoption. Meanwhile gas boilers are more damaging for the environment and hot tubs can be noisier.
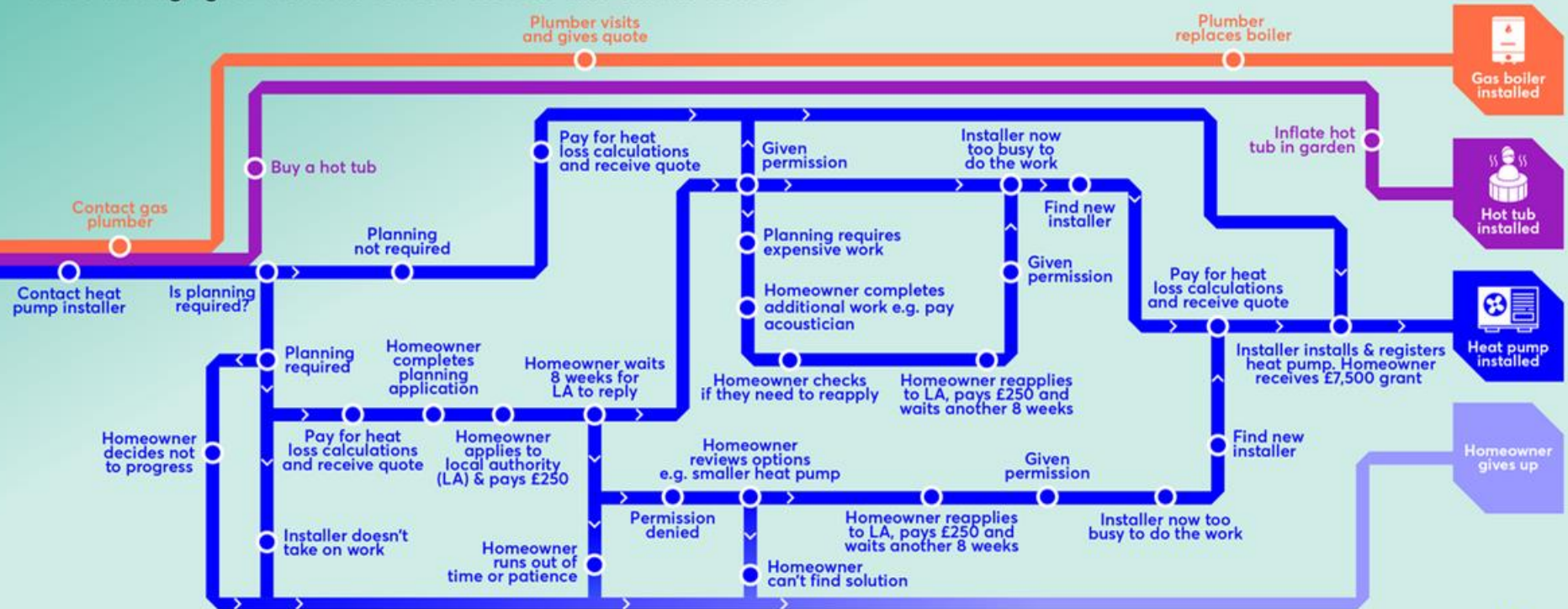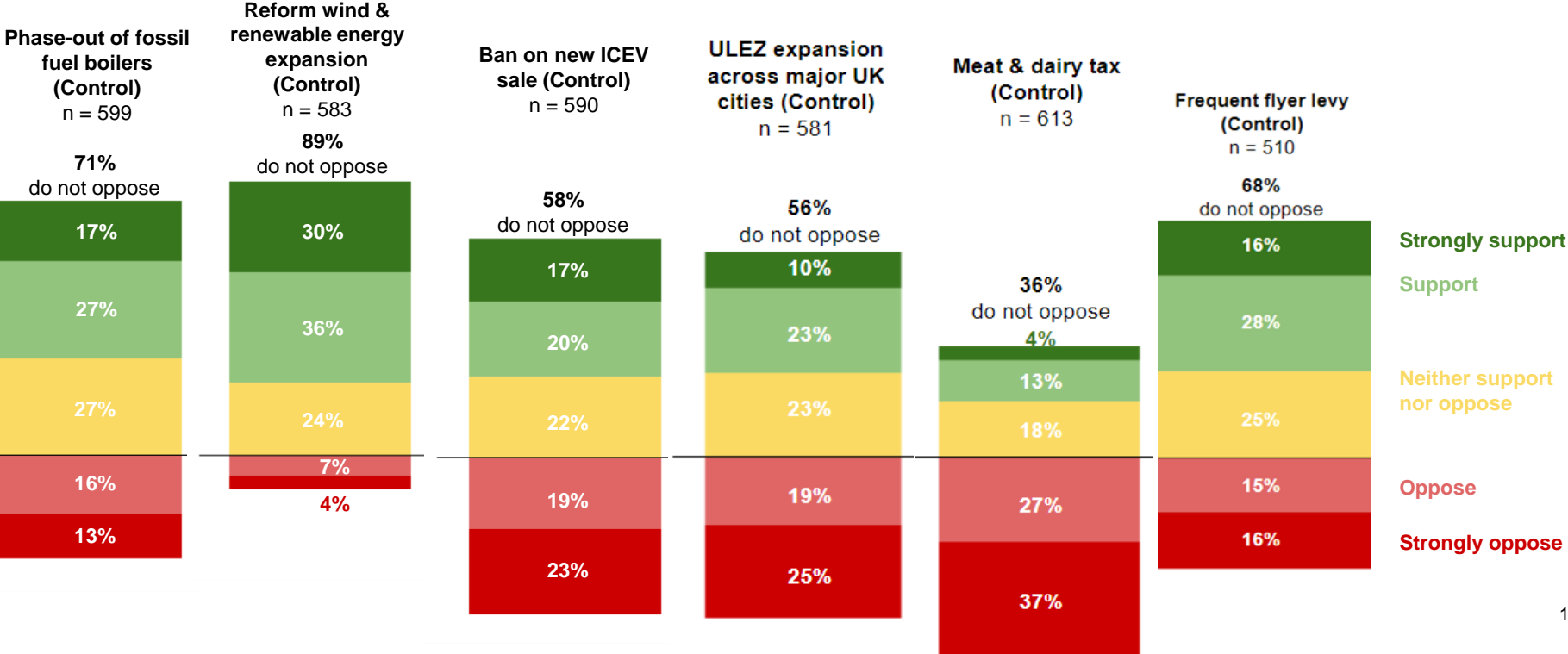
5. We generally think it's someone else's responsibility

Perceived responsibility for taking action on adaptation:

Category	Percentage
Government	50%
Local authorities	38%
Homeowners	5%
Businesses	3%
Tenants	2%
Media	1%
Financial institutions	1%

Data collected by BIT on Feb 2024. Sample of 3,610 UK adults.

6. Support for bold policy which influences behaviour is mixed (and depends very heavily on perceived fairness, benefits, effectiveness and coerciveness)

Phase-out of fossil fuel boilers (Control)
n = 599

71% do not oppose

17%
27%
27%
16%
13%

Reform wind & renewable energy expansion (Control)
n = 583

89% do not oppose

30%
36%
24%
7%
4%

Ban on new ICEV sale (Control)
n = 590

58% do not oppose

17%
20%
22%
19%
23%

ULEZ expansion across major UK cities (Control)
n = 581

56% do not oppose

10%
23%
23%
19%
25%

Meat & dairy tax (Control)
n = 613

36% do not oppose

4%
13%
18%
27%
37%

Frequent flyer levy (Control)
n = 510

68% do not oppose

16%
28%
25%
15%
16%

Strongly support
Support
Neither support nor oppose
Oppose
Strongly oppose

Data collected by BIT, 30 May-10 June 2024. Additions/alternatives were compared against the (Control) policy. **p<.01, * p<.05, +p <.1. Results in this deck are not corrected for multiple comparisons and should be interpreted as exploratory. Numbers are rounded and may not sum to 100%.

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In summary so far…

We want a more sustainable and resilient society, BUT:

- This depends on widespread behaviour change and public engagement
- The key actions required of us demand too much cost and effort
- We don't want to significantly compromise our lifestyles
- We don't really know what actions we should be prioritising
- We don't know how to do them
- We're skeptical of green technologies
- We think responsibility should mainly be on others (Government, businesses)
- Yet support for bold policies that would tackle the above, is mixed

So what do we need to do?

Back to first principles… how does behaviour 'happen'?

> " *Individuals* **make choices** as a function of their preferences, knowledge, values, habits and biases, **within choice environments that exert profound influence** due to the proximate effects of pricing, convenience, salience, defaults, and social pressures**, which exist as they do largely because of a** system of commercial incentives, competitive markets, regulation, cultural norms, investment & infrastructure decisions and institutional leadership. "

Micro

Meso

Macro

We can encourage, enable or default green choices by acting downstream, midstream or upstream

Downstream *"Swim this way!"*
- Encourage direct individual action
- Effective communications, marketing and public engagement

Online experiment

We redesigned labels to encourage energy-efficient purchases
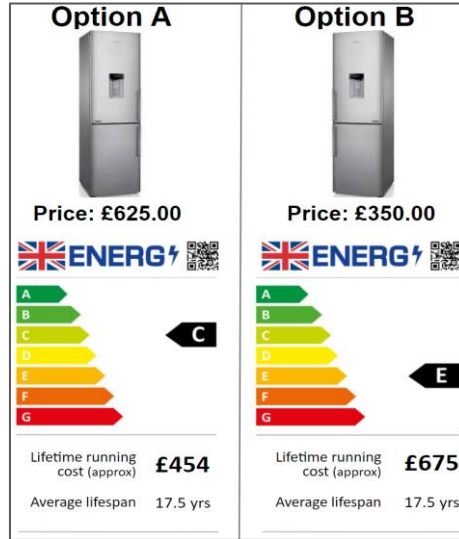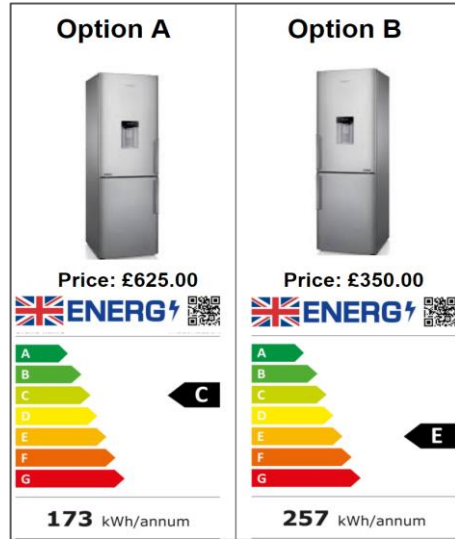
(Left) original labels vs. (right) new £-labels.

** $p < 0.01$, * $p < 0.05$
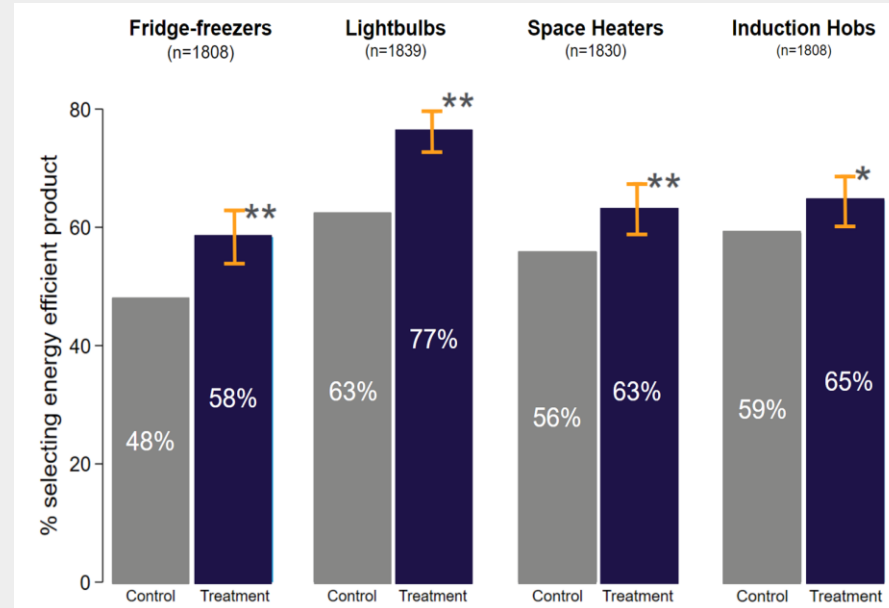
Framing to encourage sustainable food choices

What we did: We ran a series of online experiments on sustainable food consumption with the World Resources Institute (WRI) to explore how language might be used to encourage non-vegetarians to choose plant-based options from cafe and restaurant menus.

What we found: We found that describing food as 'field-grown' rather than 'meat-free' **roughly doubled self-reported ordering rates of vegetarian items**. These results have broadly been replicated in the field - in Sainsbury's grocery stores - by WRI.

% of consumers choosing vegetarian dishes

Meat-free Breakfast (control)	Feel Good Breakfast	Garden Breakfast	Super Value Breakfast	Field Grown Breakfast
6.8	11.9	11.9	11.1	13.1
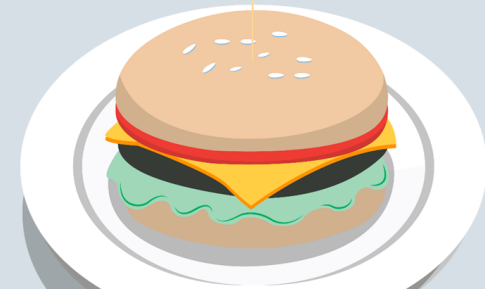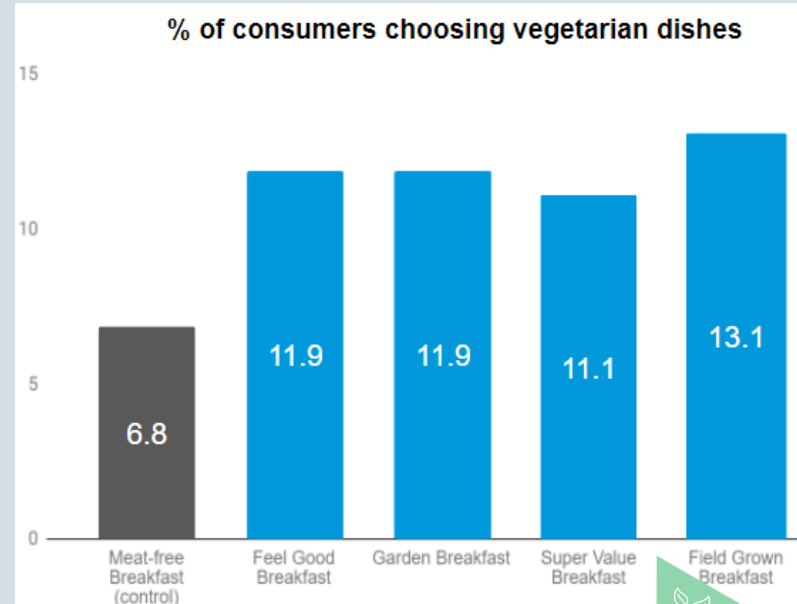
We encouraged modal shift at a timely 'moment of change'

What we did: With the US city of Portland, we conducted a randomised controlled trial to encourage modal shift among commuters. Specifically to encourage them to sign up to a bike sharing scheme - testing leaflets and a promotion code.

What we found: We found that those who had just moved houses were about 4 times more likely to sign up - showing the **value of encouraging habit change at moments of disruption.**

Signups by Recipient Type

N=10,500
*** p≤0.001, ** p≤0.01, * p≤0.05, + p≤0.1

New Station: 0.31%
New Mover: 1.14% ***
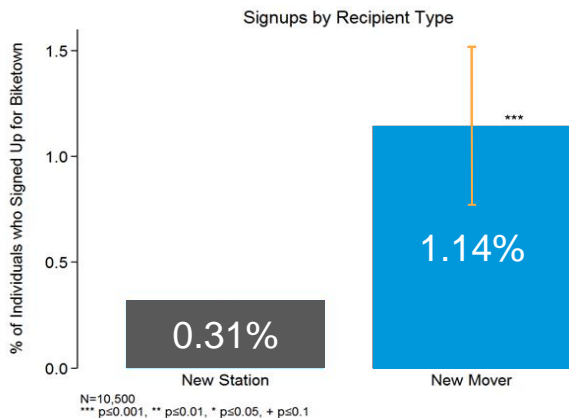
The **city transportation bureau have subsequently used these findings** to help encourage municipal bike sharing.

Improving government communications and services - flood plans

Simplified the purpose of the flood plan

Provided flood warning website as well as key info

Personal flood plan
Filling out this document will help you to plan what to safe and get support in the event of a flood; and (3) pr

What can I do now?

1. Sign up for free flood warnings

Go to www.gov.uk/sign-up-for-flood-warnings or sign up. You will need:
- ❑ Your postcode
- ❑ Your address
- ❑ An email address

3. Find out where your electricity, gas, and water cut-off points are and note the locations down.

Service	Where you might find it	Where is it in your home?
Electricity	Your mains electricity switch is usually a big red switch on your fuse box	

enters the house.

Flooding can be sudden and mean losing possessions, being forced out of your home, and lengthy repair works. It's tough - and can also be difficult for children, pets, and other dependents.

Take a moment now to think about what it would be like for you and (if applicable) others who you live with if your home was flooded.

Improving a personal flood plan

Figure 18: Usefulness of flood plan, by treatment arm
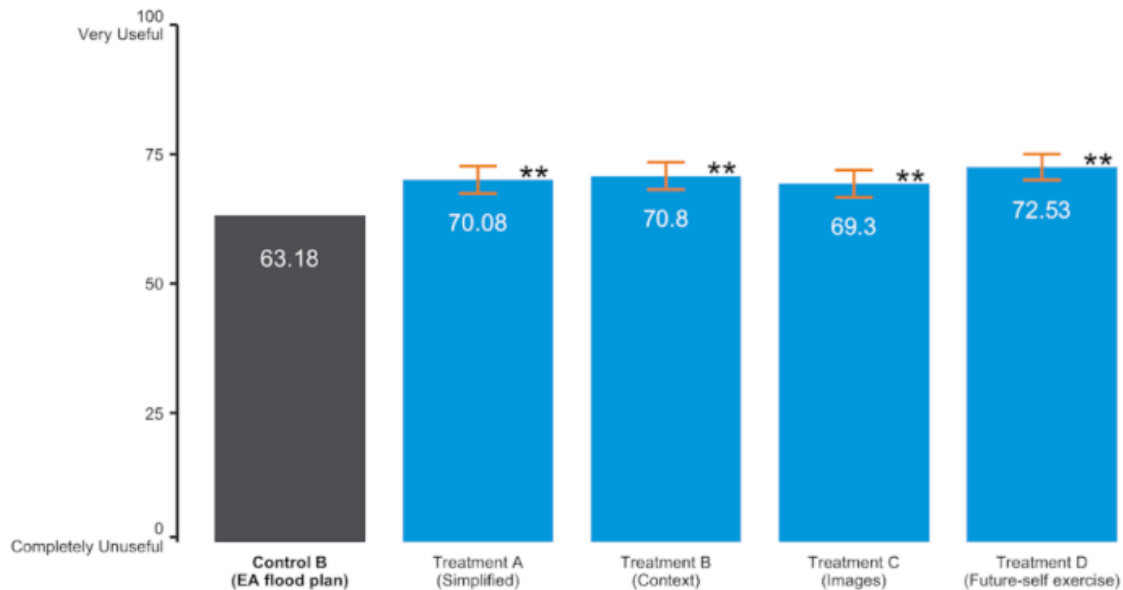
N = 3,563
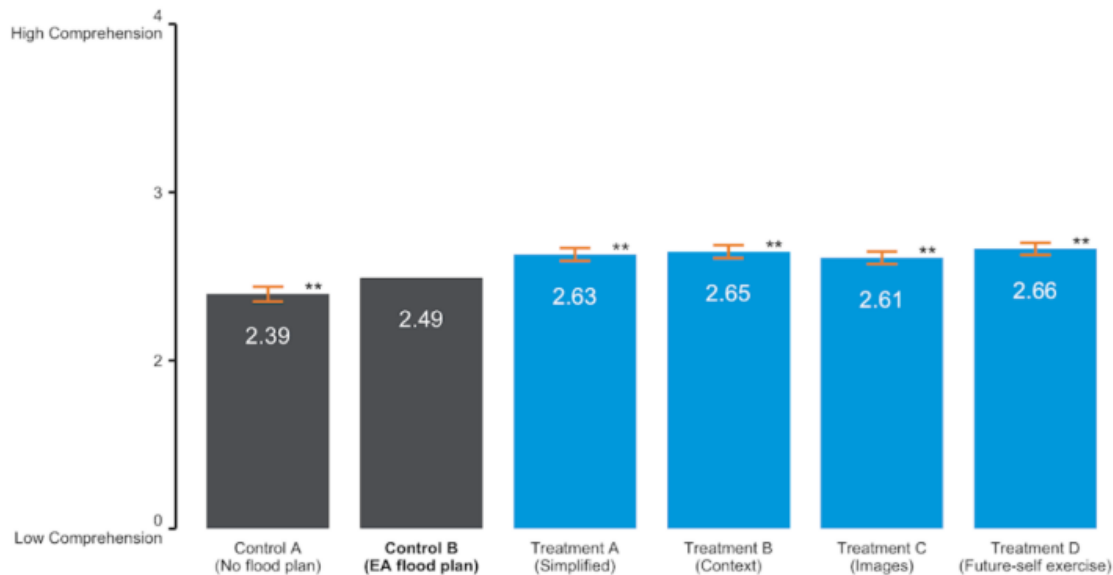** p<0.01, * p<0.05, + p<0.1, adjusted for multiple comparisons
Errorbars = 95% CI for each treatment effect vs. Control B
Primary analysis

Improving a personal flood plan

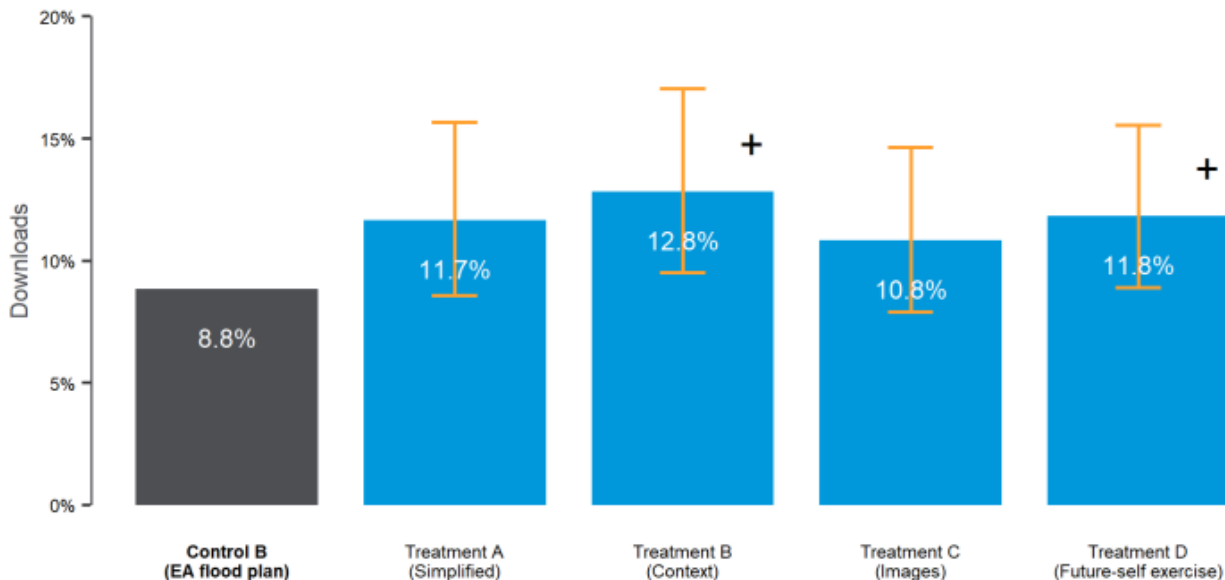Figure 19: Comprehension of actions to take in a flood, by treatment arm

N = 3,866
** p<0.01, * p<0.05, + p<0.1, adjusted for multiple comparisons
Errorbars = 95% CI for each treatment effect vs. Control B
Secondary analysis

Improving a personal flood plan

n = 3563
** p < .01, * p < .05, + p < 0.1
Secondary analysis, with covariates
Corrected for multiple comparisons

Improving a personal flood plan

Figure 21: Preparedness for flood, by treatment arm

Control A (No flood plan): 52.7 **
Control B (EA flood plan): 61.29
Treatment A (Simplified): 67.4 **
Treatment B (Context): 66.88 **
Treatment C (Images): 66.86 **
Treatment D (Future-self exercise): 68.46 **

N = 3,866
** p<0.01, * p<0.05, + p<0.1, adjusted for multiple comparisons
Errorbars = 95% CI for each treatment effect vs. Control B
Secondary analysis
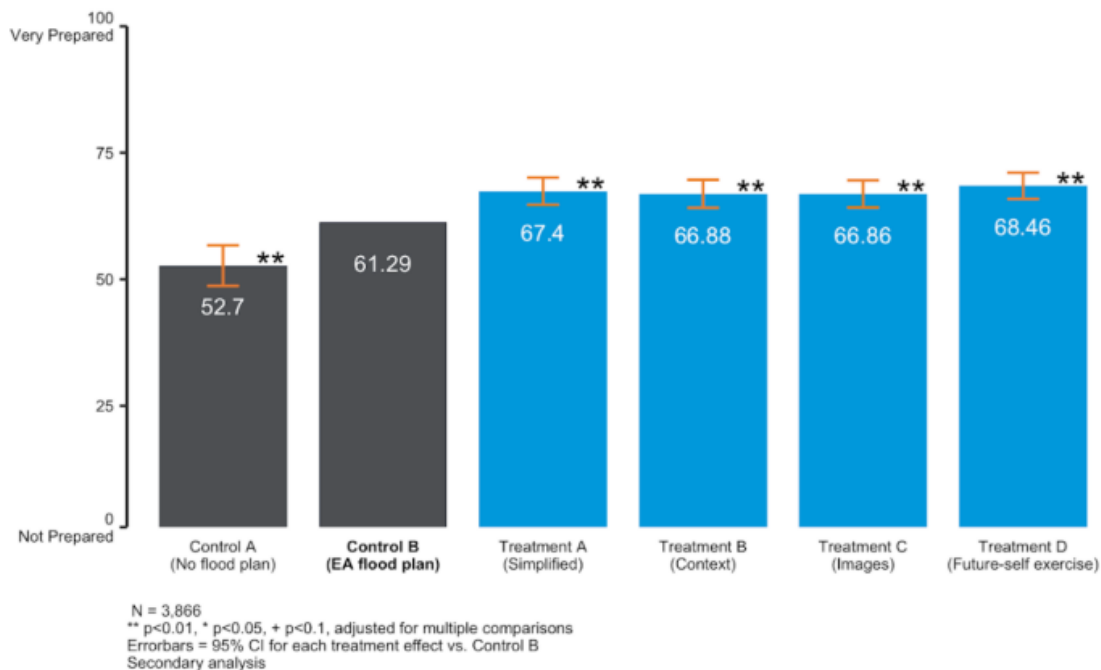
Improving a personal flood plan

Our re-designed flood plans also:

❖ Increased **completion rates** over Environment Agency version

❖ Increased **acceptance of personal responsibility** to make home flood resilience (vs. 'government's responsibility')

❖ Boosted **self-efficacy** (belief that they were capable of being more prepared for a flood and responding appropriately)

❖ Increased **perceived likelihood / risk** exposure of flooding (under-estimated at baseline)

We can encourage, enable or default green choices by acting downstream, midstream or upstream
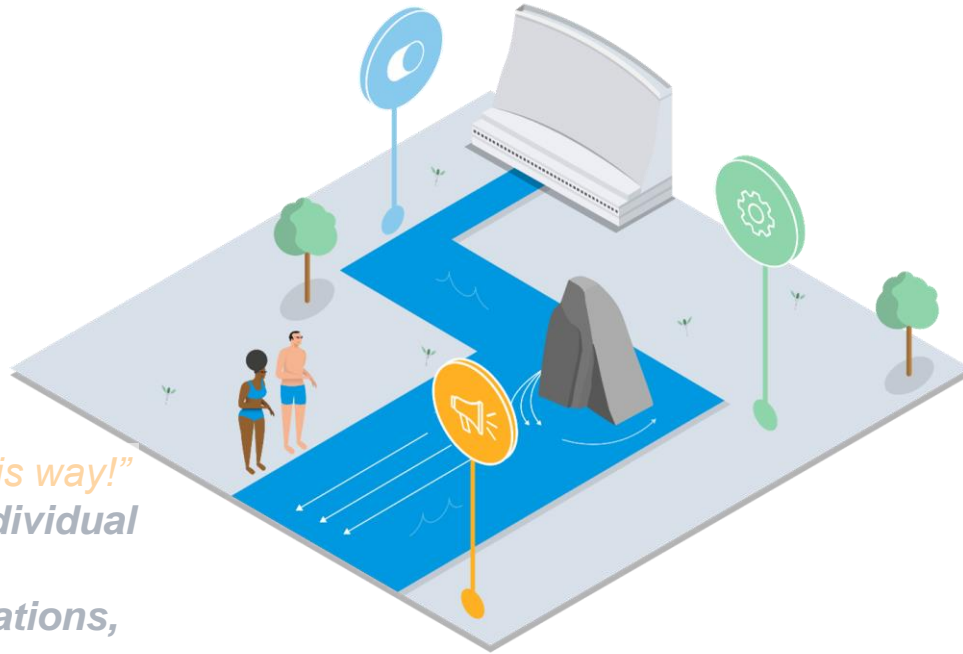
Midstream "deflect the current"
- Create an enabling choice environment
- Green actions should be easy, available, affordable, normal or the default

Downstream *"Swim this way!"*
- Encourage direct individual action
- Effective communications, marketing and public engagement

Changing the choice environment to reduce food waste in hotel canteens

1. **Smaller portions by default**. Can always come back for more
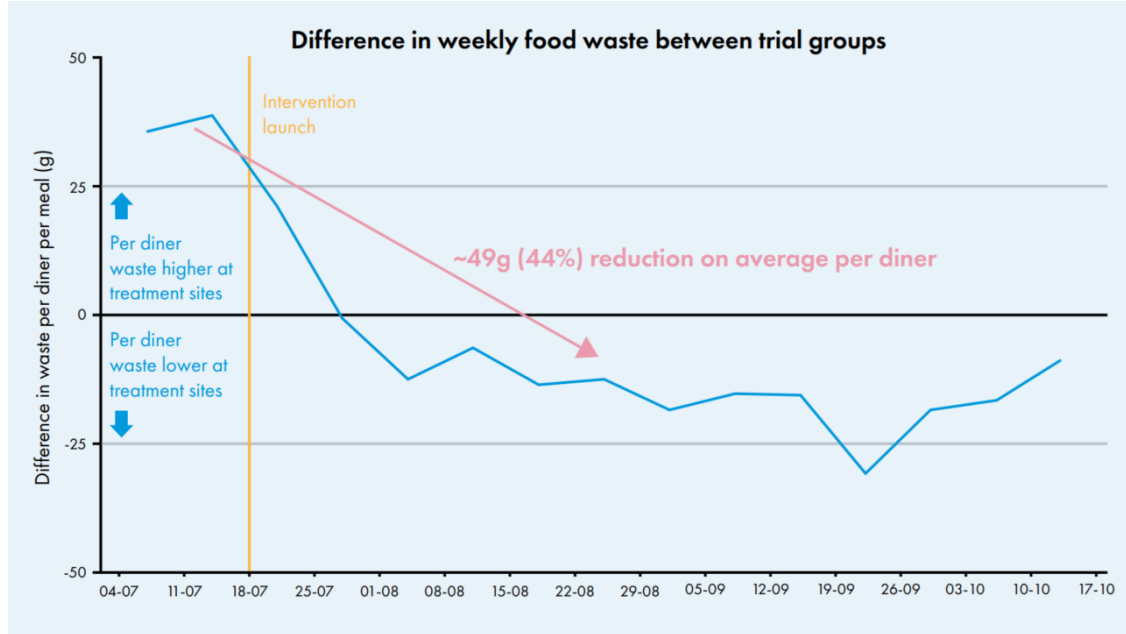

3. **Leadership boards** (social comparison) + **transparent bins** (observability) aim to engender new norms

2. **Signage** scattered throughout the service and dining area using a variety of insights (norms, salient messengers, etc.)

Trial. An RCT / difference-in-difference analysis

Difference in weekly food waste between trial groups

~49g (44%) reduction on average per diner

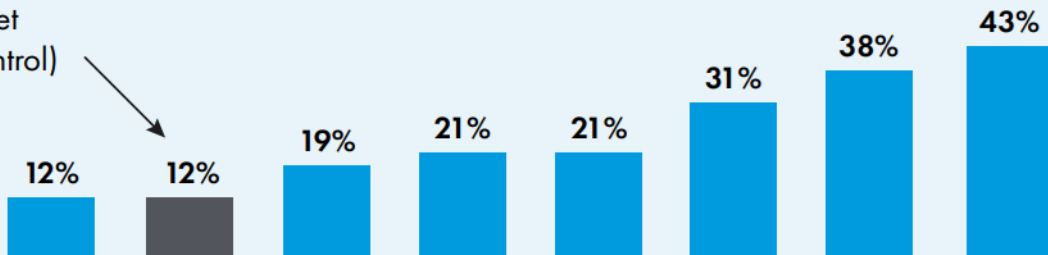**If scaled nationally across hospitality in the UAE**

5% reduction in waste = **1/10** of UAE's 50% goal by 2030

144,000 tonnes saved = **$200m** annual savings

Testing incentives for heat pumps

Current market situation (Control)

	12%	12%	19%	21%	21%	31%	38%	43%
Installation cost	£10,500				£5,500		£10,500	£5,500
Payment method	Upfront			Over time	Upfront	Over time	Over time	Upfront
Installation time	3 days	10 days	10 days	10 days	10 days	10 days	10 days	10 days
Running cost	High	High	Low	High	High	High	Low	Low

N = 8,016; Choices = 24,048.
Descriptive statistics, no significance testing.
Data collected by BIT on 11 March - 5 April 2022

Lower upfront cost
(£5.5k vs. £10.5k)

    +   10pp

Lower running costs
(+£20 vs -£20 per month)

    +   7pp

Combined

    +   31pp

When a price is a nudge: Incentives work, but don't forget the psychological dimensions of pricing

Why do small plastic bag levies work so well? (97% reduction according to Defra)

- A weak economic incentive
- But effectively 'crowds-in' psychological factors. A default, a social norm, a salient reminder.

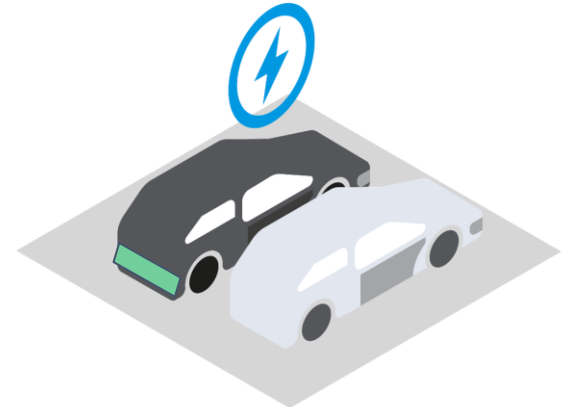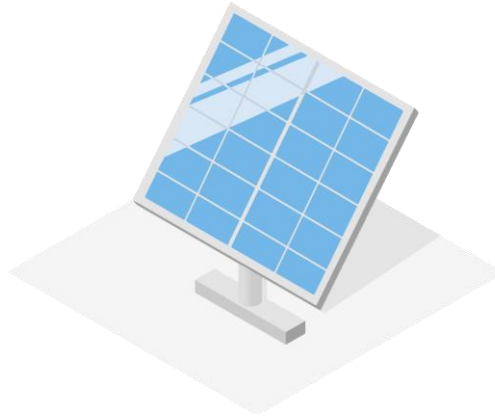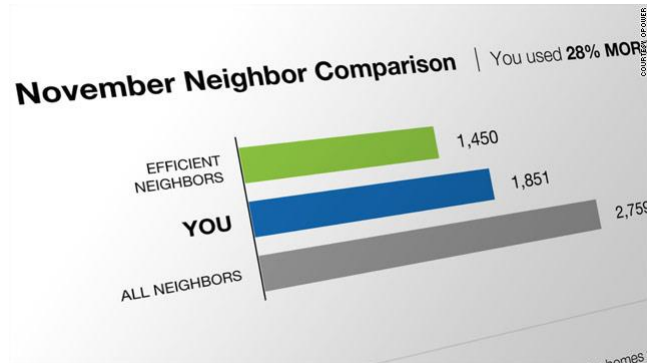**Use smarter incentives.**
Would you throw away a £100k lottery ticket?

Social aspects of in the choice environment

Make the green choice the socially normative choice

We're social creatures (social proof, reciprocity, conformity to norms), yet many green choices are invisible, unfamiliar, or not yet a majority norm.

We can normalise green choices by making them more **visible** (home signage for retrofits, property listings, 'show-home' networks), driving **collective action** (e.g. postcode collective switching), and using the right **messengers** (e.g. subsidise plumbers' first heat pump installation, use referral incentives for heat pumps and EVs)
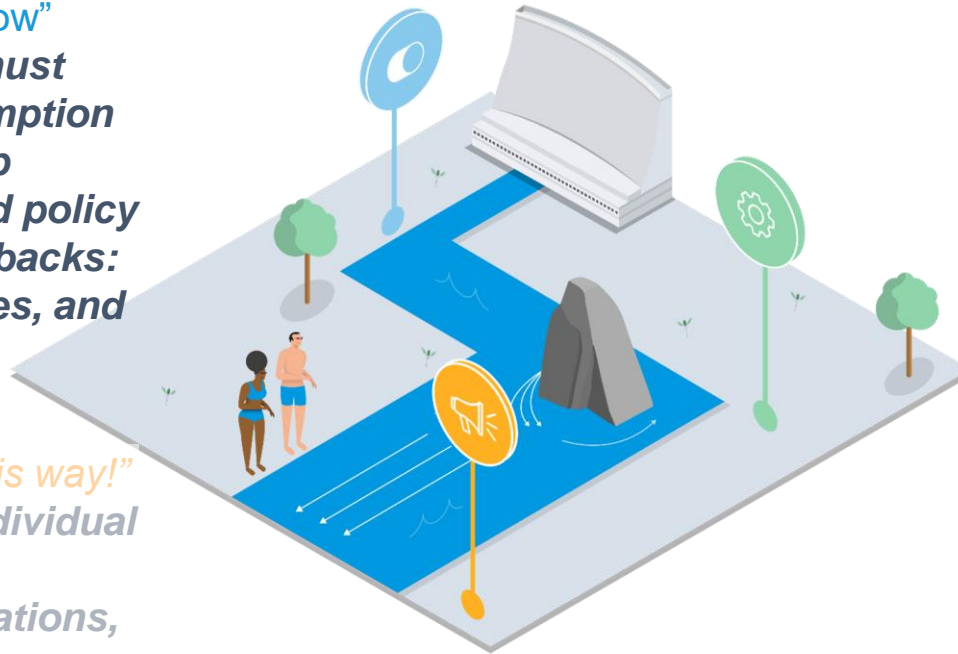
We can encourage, enable or default green choices by acting downstream, midstream or upstream

Upstream "redirect the flow"
- *Business incentives must align with green consumption*
- *Institutional leadership*
- *Public support for bold policy*
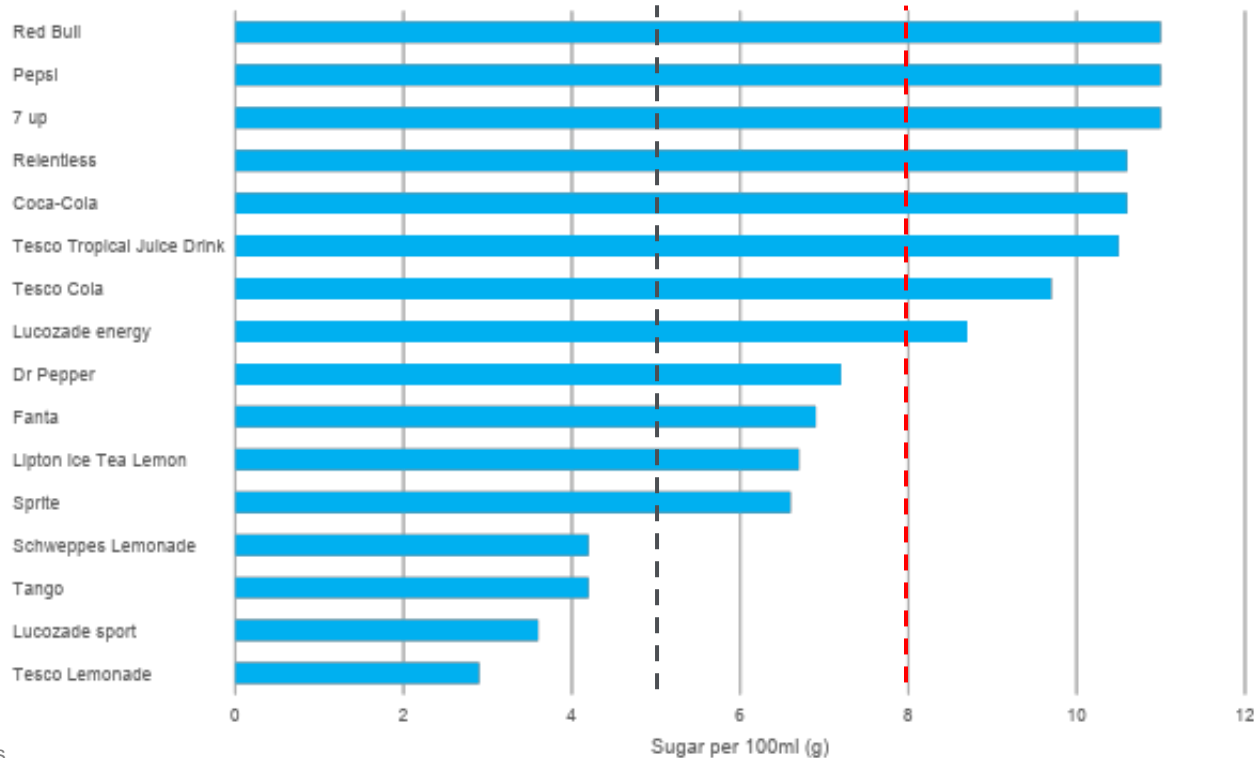- *Leverage system feedbacks: markets, media cascades, and investment*

Midstream "deflect the current"
- *Create an enabling choice environment*
- *Green actions should be easy, available, affordable, normal or the default*

Downstream *"Swim this way!"*
- *Encourage direct individual action*
- *Effective communications, marketing and public engagement*

Sugar tax – targeting producers and consumers

Sugar per 100ml (g)

Drink	Sugar per 100ml (g)
Red Bull	11
Pepsi	11
7 up	11
Relentless	10.6
Coca-Cola	10.6
Tesco Tropical Juice Drink	10.5
Tesco Cola	9.7
Lucozade energy	8.7
Dr Pepper	7.2
Fanta	6.9
Lipton Ice Tea Lemon	6.7
Sprite	6.6
Schweppes Lemonade	4.2
Tango	4.2
Lucozade sport	3.6
Tesco Lemonade	2.9

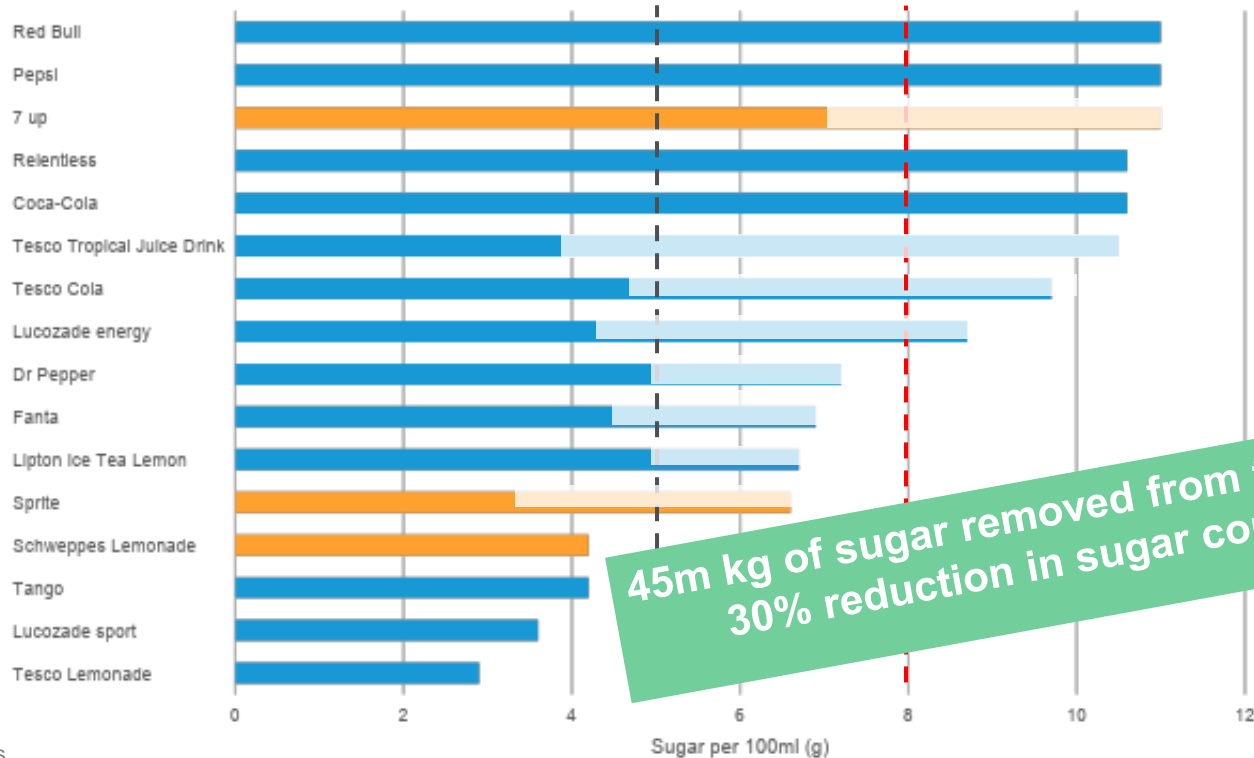We can target incentives 'upstream' to change the choice environment, rather than to change consumer behaviour

Sugar tax – targeting producers and consumers

45m kg of sugar removed from the British diet
30% reduction in sugar consumption

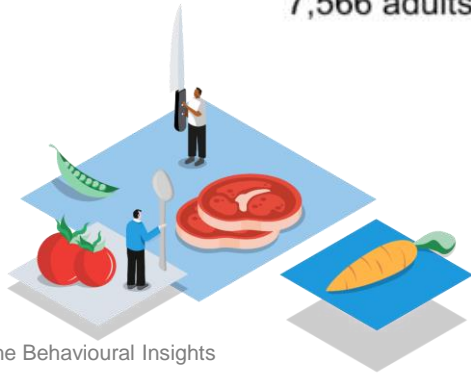# Can this approach also increase public acceptability?
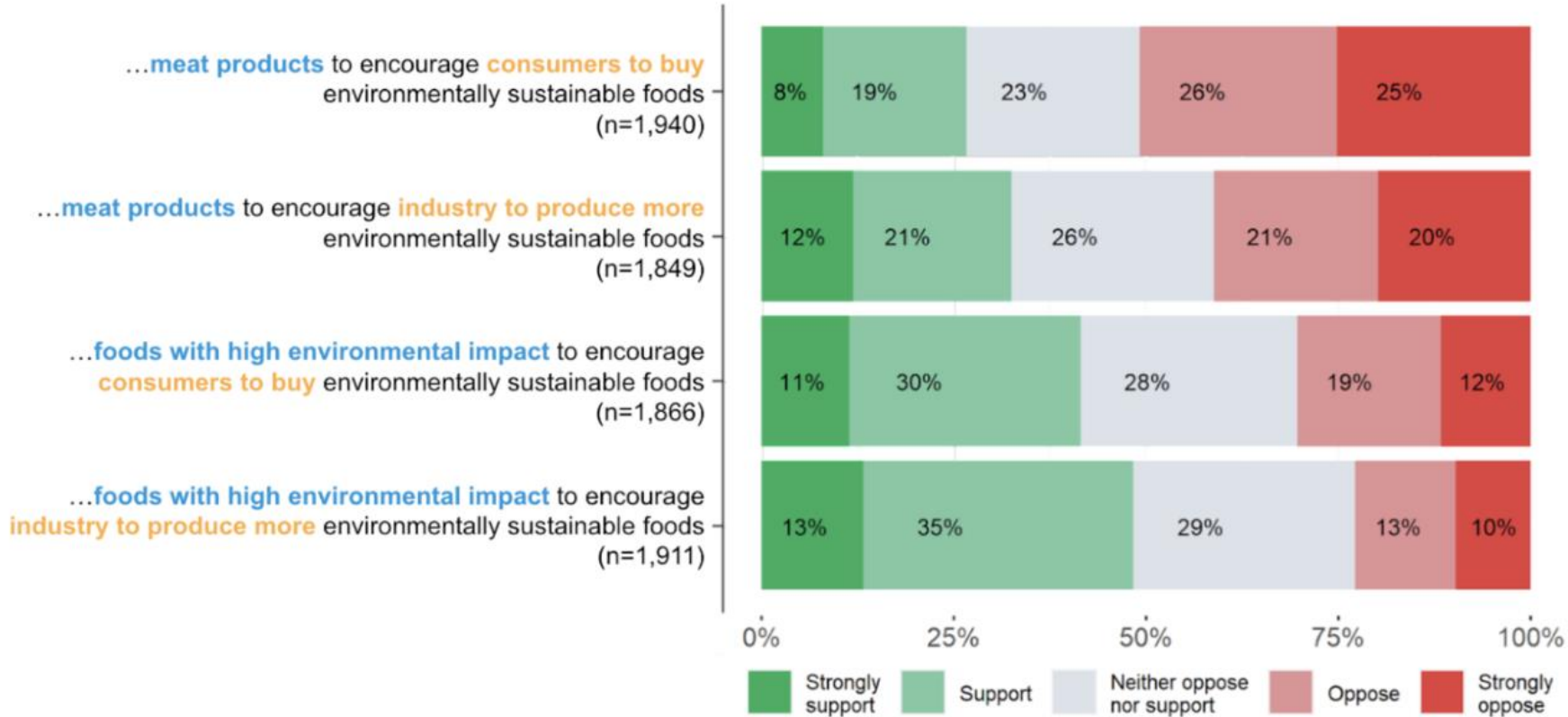
7,566 adults

Randomise

How much would you oppose or support the introduction of a tax on **meat products** to encourage **consumers to buy** environmentally sustainable foods?

How much would you oppose or support the introduction of a tax on **meat products** to encourage **industry to produce more** environmentally sustainable foods?

How much would you oppose or support the introduction of a tax on **foods with high environmental impact** to encourage **consumers to buy** environmentally sustainable foods?

How much would you oppose or support the introduction of a tax on **foods with high environmental impact** to encourage **industry to produce more** environmentally sustainable foods?

...**meat products** to encourage **consumers to buy** environmentally sustainable foods (n=1,940)
Strongly support 8% | Support 19% | Neither oppose nor support 23% | Oppose 26% | Strongly oppose 25%

...**meat products** to encourage **industry to produce more** environmentally sustainable foods (n=1,849)
Strongly support 12% | Support 21% | Neither oppose nor support 26% | Oppose 21% | Strongly oppose 20%

...**foods with high environmental impact** to encourage **consumers to buy** environmentally sustainable foods (n=1,866)
Strongly support 11% | Support 30% | Neither oppose nor support 28% | Oppose 19% | Strongly oppose 12%

...**foods with high environmental impact** to encourage **industry to produce more** environmentally sustainable foods (n=1,911)
Strongly support 13% | Support 35% | Neither oppose nor support 29% | Oppose 13% | Strongly oppose 10%

Legend: Strongly support | Support | Neither oppose nor support | Oppose | Strongly oppose

'Shrouded markets' also create misaligned incentives between businesses and consumer or society benefits

Across the economy, consumers struggle to tell the difference between good and bad products. Critical information - real lifetime cost, environmental impact, quality - is either missing, hard to access or compare, or overlooked due to behavioural biases. The markets are 'shrouded'.

This has obvious costs for consumers, but the effects on the economy run much deeper. If consumers cannot identify the best, greenest, best value products and services, firms have no incentive to compete on being green, stifling innovation.

Greenwash prevails in the absence of more reliable market signals

The Shrouded Economy

David Halpern
Lucy Makinson
Elisabeth Costa
Ben Szreter
Nida Broughton

THE BEHAVIOURAL INSIGHTS TEAM

Property rentals - an example of shrouded and overlooked information undermining incentives within the system

- Hidden at the bottom
- Many are 'pending'
- Those included don't have full certificate (which would show costs)
- It's under-valued information to begin with (future discounting, knowledge, other priorities)
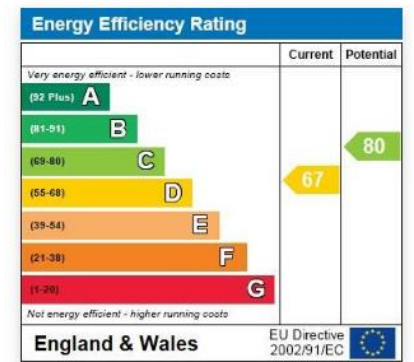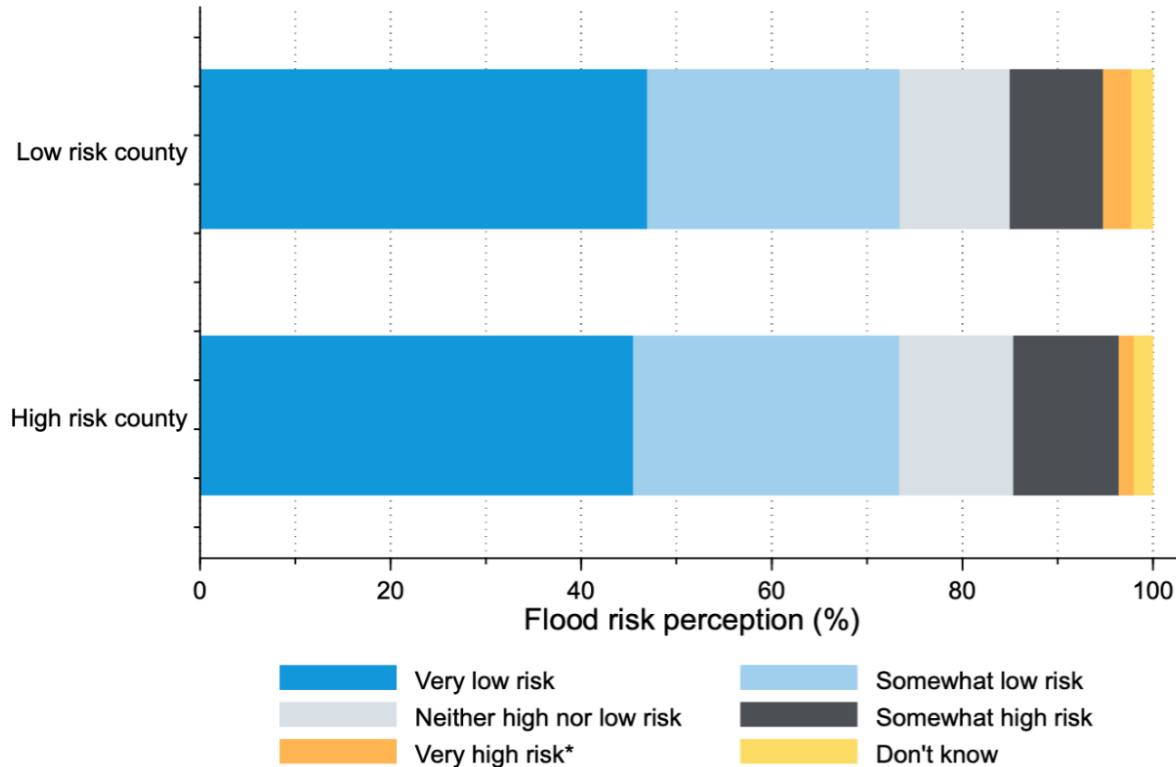
What about adaptation?

Perception of flood risk isn't impacted by actual risk of region

Low risk county

High risk county

Flood risk perception (%)

- Very low risk
- Somewhat low risk
- Neither high nor low risk
- Somewhat high risk
- Very high risk*
- Don't know

N low risk=839; N high risk=1,194
What level of risk from flooding do you feel your home is at?
** p<0.01, * p<0.05

But perception of risk is affected by past experience of flooding

Flood risk perception (%)

Legend:
- Very low risk**
- Neither high nor low risk**
- Very high risk**
- Somewhat low risk
- Somewhat high risk**
- Don't know
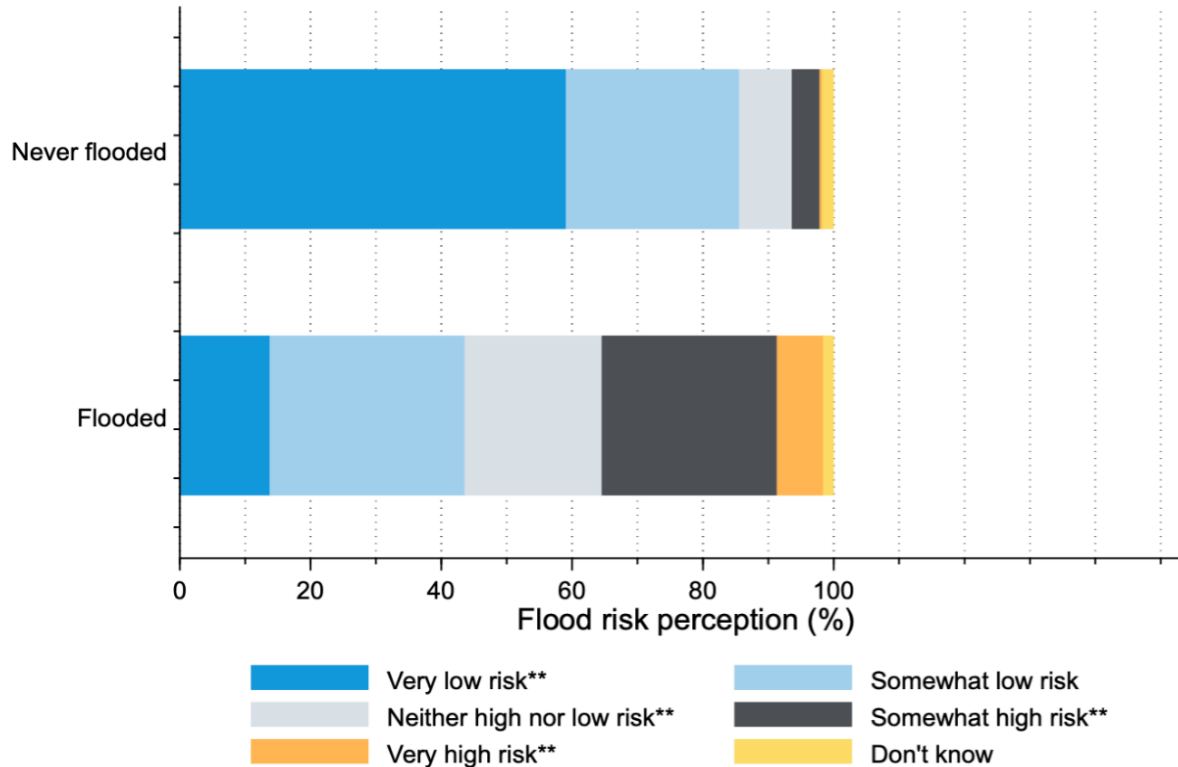
N never flooded=1,454; N flooded=553
What level of risk from flooding do you feel your home is at?
** p<0.01, * p<0.05

People think flooding is both the Government's and households' responsibility… but bias much more towards government than for other risks

Homeowner vs. Government responsibility for events (0 to 4)

N never flooded=1,454; N flooded=553
Please indicate who is more responsible for protecting your home from each of the following risks.
** p<0.01, * p<0.05
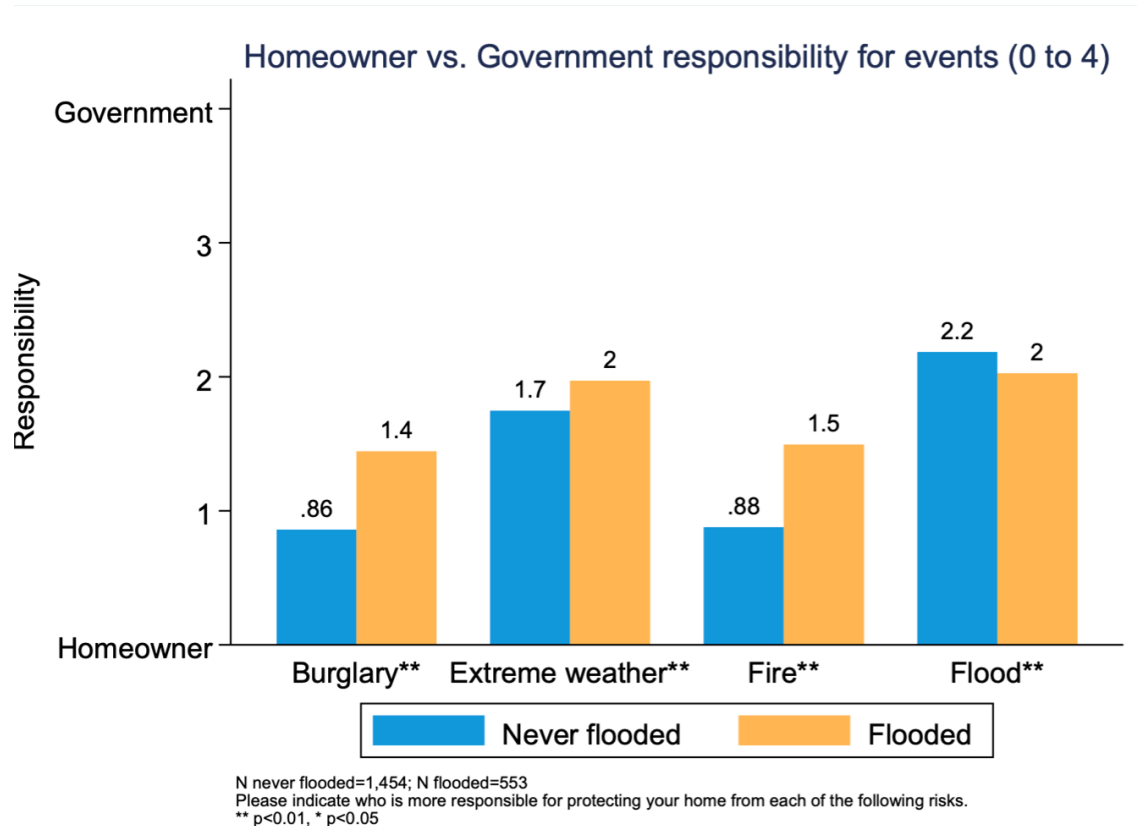
But overall, there is very little research…

❖ "**There is little evidence** of effective adaptation behaviour change interventions, and most of what does exist is methodologically weak" - CAST / CCC

❖ **Adaptation behaviours are not widespread**, and public knowledge/awareness is lower than mitigation

❖ **Individual experience** (e.g. of extreme weather) can encourage adaptation (or mal-adaptation)

❖ **Risk communication is a well-researched field,** but still big evidence gaps in this specific context. Clear communication; affect speaks louder than stats; and sense of personal risk must be accompanied by self-efficacy/response efficacy (something easy can be done), otherwise the response is often anxiety-avoidance rather than engagement.

But behavioural logic shows that the relationship between risk perception and action is very different for adaptation and mitigation behaviours. By way of analogy…

The risk: Climate breakdown

Mitigation behaviour

Adaptation behaviour

But behavioural logic shows that the relationship between risk perception and action is very different for adaptation and mitigation behaviours. By way of analogy…

~~The risk: Climate breakdown~~
The risk: Heart attack or stroke from high cholesterol

Mitigation behaviour   **Adaptation behaviour**

But behavioural logic shows that the relationship between risk perception and action is very different for adaptation and mitigation behaviours. By way of analogy…

~~The risk: Climate breakdown~~

The risk: Heart attack or stroke from high cholesterol

Mitigation behaviour

- Ongoing effort, upfront despite the threat being distant
- Collective action problem - we all need to act together, but TOTC - our own individual action doesn't reduce our individual risk
- Imagine if your diet and lifestyle made no difference to you, but you needed to get *everyone else* to exercise and eat healthily to reduce *your individual* risk of heart disease!?

Adaptation behaviour

Not *quite* that simple:
- Some collective action still required (e.g. community-level flood defence)
- While the perception of risk, and the alignment of incentives (individual action = individual benefit) may motivate action, there are still many barriers (self-efficacy, cost, hassle, knowledge, avoidance…)

Summary

❖ **Delivering Net Zero and climate resilience depends on substantial behaviour change** (62% of emissions)

❖ **Consumers want it.** 9 in 10 want to make greener choices, + high willingness for many specific steps, but they don't know what to do, how to do it, don't want to incur significant cost or effort, want government and business to do the heavy lifting but have mixed feelings about bolder policy solutions.

❖ …'Behaviour' is a product of **individual choices** (attitudes, biases, knowledge) within in proximate **choice environments** (pricing, availability, norms, defaults), which exist largely due to **systemic factors** (market forces, regulation, infrastructure & investment). The downstream-midstream-upstream analogy reflects this, highlighting different levers available to us.

❖ We can therefore promote behaviours through effective **information provision, framing, timely prompts and encouragement.** But it's generally more powerful to alter the **choice environment to make green choices easy, available, affordable, social normative, and the default action**. Ultimately, change at scale will likely require upstream intervention to change the system - leadership, investment, and creating incentives throughout economies which align with more sustainable consumption.

❖ There is a big **evidence gap on the behavioural aspects of adaptation,** though core behavioural principles show it is a very different equation than mitigation. But the basics still apply (make it easy, affordable, normal, available, boost self-efficacy, communicate better….)

Toby Park
Global Head of Climate, Energy & Sustainability, The Behavioural Insights Team
toby.park@bi.team

Download the report:

How to build a
Net Zero society

Using behavioural insights to decarbonise home
energy, transport, food, and material consumption

A guide for policymakers and businesses

Lead Author: Toby Park
Contributing authors: Kristina Londakova, Izzy Brennan, Andrew Schein,
Jake Reynolds, Ed Whincup, Edwin Chan, Marcos Pelenur, David Halpern

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