

We'd like to invite you to take part in a survey conducted by [university name left out for anonymity] on the use of seaweed as a form of renewable energy. The results of this survey will be used for statistical analyses and to inform researchers and policymakers on people's preferences for green energy. All responses are anonymous and confidential and will not be used for any other purpose.

Your household is among a number of households across the UK being randomly selected to participate in this research, so your participation is very important.

Please note that there are no right or wrong answers; we are only interested in your opinion. Often, when talking about green energy, or climate change, people feel pressured to say they care more about the environment than they actually do. For this survey to be effective, it's important that you respond freely and sincerely. This questionnaire should take about 20 minutes.

If you have any questions about this research, you can contact Dr. [name left out for anonymity] at [email].

I give informed consent to participate in this study.

- ☐ Yes
- ☐ No, I do not want to participate.

Screening questions

What country do you live in?

- England ☐
- Northern Ireland ☐
- Scotland ☐

What year were you born? (YYYY)

What gender are you?

- Male ☐
- Female ☐

First, we would like to ask you some general questions about the environment and climate change.

1) How important is protecting the environment to you personally? (*env4*)

- Very important ☐
- Fairly important ☐
- Not very important ☐
- Not at all important ☐
- Don't know ☐

2) In general, do you consider that you are very well, fairly well, fairly badly or very badly informed about environmental issues?

- Very well informed ☐
- Fairly well informed ☐
- Fairly badly informed ☐
- Very badly informed ☐
- Don't know ☐

3) In your opinion, to what extent do the following factors influence your quality of life? (*env1, env2, env3*)

		Very much	Quite a lot	Not much	Not at all	Don't know
1	State of the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Economic factors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Social factors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4) Please tell us to what extent you agree or disagree with each of the following statements. (*env5, env6, env7*)

		Totally agree	Tend to agree	Tend to disagree	Totally disagree	Don't know
1	You are willing to buy environmentally friendly products even if they cost a little bit more.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	As an individual you can play a role in protecting the environment in your country.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	The big polluters should be mainly responsible for making good the environmental damage they cause.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Environmental issues have a direct effect on your daily life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5) In your opinion, is each of the following currently doing too much, doing about the right amount, or not doing enough to protect the environment?

		Doing too much	Doing about the right amount	Not doing enough	Don't know
1	Big companies and industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Citizens themselves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Your city, town or village	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Your region	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	The government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6) Which of the following do you consider to be the single most serious problem facing the world as a whole?

Climate change	<input type="checkbox"/>
International terrorism	<input type="checkbox"/>
Poverty, hunger and lack of drinking water	<input type="checkbox"/>
Spread of infectious diseases	<input type="checkbox"/>
The economic situation	<input type="checkbox"/>
Proliferation of nuclear weapons	<input type="checkbox"/>
Armed conflicts	<input type="checkbox"/>
The increasing global population	<input type="checkbox"/>
Other	<input type="checkbox"/>
None	<input type="checkbox"/>
Don't know	<input type="checkbox"/>

7) And how serious a problem do you think climate change is at this moment? Please use a scale from 1 to 10, with '1' meaning it is "not at all a serious problem" and '10' meaning it is "an extremely serious problem".

1 Not at all a serious problem					10 An extremely serious problem					Don't know
1	2	3	4	5	6	7	8	9	10	11

8) In your opinion, who is responsible for tackling climate change? (Tick all that apply.)

National governments	<input type="checkbox"/>
Regional and local authorities	<input type="checkbox"/>
Business and industry	<input type="checkbox"/>
You personally	<input type="checkbox"/>
Environmental groups	<input type="checkbox"/>
Other	<input type="checkbox"/>
None	<input type="checkbox"/>
Don't know	<input type="checkbox"/>

9) How important do you think it is that the government sets targets to increase the amount of renewable energy used, such as wind or solar power, by 2030?

- Very important ☐
- Fairly important ☐
- Not very important ☐
- Not at all important ☐
- Don't know ☐

Recent data show that the UK has decreased greenhouse gas emissions by 38% since 1990. The 2030 target is to decrease them a total of 57%. One way of reaching this target is by using more renewable energy.

10) Overall, how much do you favour the use of renewable energy as one of the ways to provide energy for the UK or for Northern Ireland?

For the UK		For Northern Ireland	
Strongly favour	<input type="checkbox"/>	Strongly favour	<input type="checkbox"/>
Somewhat favour	<input type="checkbox"/>	Somewhat favour	<input type="checkbox"/>
Somewhat oppose	<input type="checkbox"/>	Somewhat oppose	<input type="checkbox"/>
Strongly oppose	<input type="checkbox"/>	Strongly oppose	<input type="checkbox"/>
Don't know	<input type="checkbox"/>	Don't know	<input type="checkbox"/>

Some people are worried about supporting renewable energy because it requires a lot of land. For example, for the same amount of energy you would get from 1 nuclear power plant, you would need a solar plant at least 35 times the size of the nuclear plant, or a wind farm at least 200 times the size of the nuclear plant.

11) How important is protecting land to you?

- Very important ☐
- Fairly important ☐
- Not very important ☐
- Not at all important ☐
- Don't know ☐

A New Form of Renewable Energy

Recently, scientists have studied using seaweed as a source of renewable energy. Seaweed farms can be grown in salt water, from long lines supported by buoys and are harvested once a year. The seaweed is treated through a biological process, which generates methane gas. The methane can be passed through an engine to produce renewable energy.

The potential benefit of seaweed farming is that there is no competition with land resources to grow the crop, therefore no chemical fertilizers and there is improved waste processing. However, seaweed farms may hinder recreational use at a specific site, might affect the local fishermen and the view of the buoys might bother some people.



1) Overall, how much would you favour the use of seaweed to produce renewable energy?

- Strongly favour ☐
- Somewhat favour ☐
- Somewhat oppose ☐
- Strongly oppose ☐
- Don't know ☐

Analysing the different characteristics of renewable energy

The UK government is considering a program which uses seaweed for renewable energy. This program can be described using 4 characteristics. I will describe each characteristic here.

1) Number of households powered using seaweed.

The renewable energy created from the seaweed farms would be used to power households. Seaweed could be farmed on a smaller scale, powering 45,000 households a year, on a medium scale, or on a larger scale, powering 130,000 households a year.

Number of households powered	45,000 Households	85,000 Households	130,000 Households
------------------------------	-------------------	-------------------	--------------------

How much would you favour your own household being powered by renewable energy from seaweed?

- Strongly favour ☐
- Somewhat favour ☐
- Somewhat oppose ☐
- Strongly oppose ☐
- Don't know ☐

2) Percentage of coastline used for seaweed farms

The seaweed would be grown along the UK coastline. In some areas, seaweed farms could be extended further into the sea, so the percentage of coastline used could vary. The percentage could be as low as 10% or as high as 30%.

How concerned would you be with using sea water sites for growing seaweed?

- Very concerned ☐
- Fairly concerned ☐
- Not very concerned ☐
- Not at all concerned ☐
- Don't know ☐

3) Cost



The use of seaweed to generate green bioenergy, however, may come with an additional cost to cover seaweed farming costs (until improved technology and mechanization brings the costs down). Households would, therefore, have to opt into a seaweed project scheme on their electricity bill in order to support the additional costs. The **cost** would be an additional cost on top of your current household annual electricity bill and could take on the following values:

Increase in electricity bill per year	£10	£20	£50	£100	£150
---------------------------------------	-----	-----	-----	------	------

How much does your household currently spend per year on electricity bills? £_____

4) Perks

Some perks might be offered if you choose to opt into the seaweed project scheme. Two perks being considered are: 1) a special eco-friendly overlay for your Facebook profile picture certified by the electricity provider, 2) a letter informing you of the number of houses powered thanks to your contribution, or 3) no perks at all.

Perks	Facebook profile picture overlay 	A letter with your contribution 	Nothing.
--------------	---	--	----------

How much are these perks likely to affect your decision to opt into the seaweed project scheme?

	None	Very little	Some	A lot	Don't know
Facebook profile picture overlay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A letter describing your contribution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Choice Questions

In this part of the questionnaire, we will ask you to choose between options representing different hypothetical choices for renewable energy. Each alternative is described by the characteristics just presented to you: number of households powered, percentage of coastline used for seaweed farming, increase in electricity bill per year, and perks.

Although there might be other important factors related to the issue, remember to focus on the characteristics of the alternatives presented since they are the objects of this study. All responses are **anonymous and confidential**. **There are no right or wrong answers**, we are only interested in knowing your opinion. This survey is hypothetical and in no way binds you to any future payments. It's only important to analyse each choice set and choose the option you prefer. Two alternatives are presented in each choice together with a "neither" option which means no change from your current situation. We will show you 10 choice questions. Treat each choice question as independent.

Before choosing your preferred option in each card, think of your household's budget and the impact that your choice would have on your budget.

Choice 1

Characteristics	Alternative A	Alternative B	Neither
Number of households powered	85,000 Households	130,000 Households	No change from your current situation
% of coastline used for seaweed farms	10% of coastline	20% of coastline	
Increase in electricity bill per year	£50	£150	
Perks	Facebook profile picture overlay	A letter with your contribution	
Which alternative would you choose?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Choice 2

Characteristics	Alternative A	Alternative B	Neither
Number of households powered	45,000 Households	130,000 Households	No change from your current situation
% of coastline used for seaweed farms	10% of coastline	30% of coastline	
Increase in electricity bill per year	£150	£20	
Perks	A letter with your contribution	None	
Which alternative would you choose?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Choice 3

Characteristics	Alternative A	Alternative B	Neither
Number of households powered	45,000 Households	85,000 Households	No change from your current situation
% of coastline used for seaweed farms	30% of coastline	20% of coastline	
Increase in electricity bill per year	£50	£100	
Perks	None	None	
Which alternative would you choose?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Choice 4

Characteristics	Alternative A	Alternative B	Neither
Number of households powered	85,000 Households	45,000 Households	No change from your current situation
% of coastline used for seaweed farms	20% of coastline	10% of coastline	
Increase in electricity bill per year	£20	£50	
Perks	A letter with your contribution	Facebook profile picture overlay	
Which alternative would you choose?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Choice 5

Characteristics	Alternative A	Alternative B	Neither
Number of households powered	130,000 Households	130,000 Households	No change from your current situation
% of coastline used for seaweed farms	30% of coastline	10% of coastline	
Increase in electricity bill per year	£20	£100	
Perks	Facebook profile picture overlay	None	
Which alternative would you choose?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Choice 6

Characteristics	Alternative A	Alternative B	Neither
Number of households powered	45,000 Households	130,000 Households	No change from your current situation
% of coastline used for seaweed farms	20% of coastline	20% of coastline	
Increase in electricity bill per year	£10	£100	
Perks	A letter with your contribution	Facebook profile picture overlay	
Which alternative would you choose?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Choice 7

Characteristics	Alternative A	Alternative B	Neither
Number of households powered	130,000 Households	85,000 Households	No change from your current situation
% of coastline used for seaweed farms	20% of coastline	30% of coastline	
Increase in electricity bill per year	£50	£10	
Perks	A letter with your contribution	A letter with your contribution	
Which alternative would you choose?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Choice 8

Characteristics	Alternative A	Alternative B	Neither
Number of households powered	130,000 Households	45,000 Households	No change from your current situation
% of coastline used for seaweed farms	30% of coastline	10% of coastline	
Increase in electricity bill per year	£20	£10	
Perks	None	A letter with your contribution	
Which alternative would you choose?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Choice 9

Characteristics	Alternative A	Alternative B	Neither
Number of households powered	45,000 Households	45,000 Households	No change from your current situation
% of coastline used for seaweed farms	20% of coastline	30% of coastline	
Increase in electricity bill per year	£150	£50	
Perks	Facebook profile picture overlay	Facebook profile picture overlay	
Which alternative would you choose?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Choice 10

Characteristics	Alternative A	Alternative B	Neither
Number of households powered	85,000 Households	130,000 Households	No change from your current situation
% of coastline used for seaweed farms	20% of coastline	30% of coastline	
Increase in electricity bill per year	£50	£50	
Perks	None	Facebook profile picture overlay	
Which alternative would you choose?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

About the choice questions

1) When you made your choices did you give more importance to one of the characteristics, or did you look at all the characteristics in the same way?

- ☐ I considered all the characteristics
- ☐ I considered mainly one characteristics. Which one?

Number of households powered	<input type="checkbox"/>
Percent of coastline used for seaweed farming	<input type="checkbox"/>
Increase in electricity bill per year	<input type="checkbox"/>
Perks	<input type="checkbox"/>

2) How would you rank the characteristics according to their importance? (1st being the most important to you and the 4th as the least important):

Number of households powered	
Percent of coastline used for seaweed farming	
Increase in electricity bill per year	
Perks	

3) Did you answer the choice questions according to what was best for society or according to what was best for you?

- ☐ Society
- ☐ Me
- ☐ Don't know

Hypothetical Scenario *(used in another paper)*

Next, we would like to ask you about a hypothetical scenario.

Imagine the following situation:

- 1) You are in a room with 4 other people and a researcher. Each of you are given **£1** in loose change.
 - 2) A box is passed around to each of the 5 people in the room (the researcher is excluded).
 - 3) Each person may put all or any of the £1 into the box.
 - 4) *(Treatment 1 (standard PGG): After the box goes around the room, the researcher **doubles** the money in the box and distributes it equally among each person in the room regardless of how much money they put into the box.)*
*(Treatment 2 (climate change): After the box goes around the room, the researcher **doubles** the money in the box which is then used to reduce CO₂ emissions.*
*(Treatment 3 (climate change): After the box goes around the room, the researcher **doubles** the money in the box which is then used to reduce CO₂ emissions.*
*(Treatment 4 (climate change): After the box goes around the room, the researcher **doubles** the money in the box which is then used to reduce CO₂ emissions.*
 - 5) *(Each person will go home with whatever they kept plus what they received from the box.)*
(Each person will go home with whatever they kept.)
(Each person will go home with whatever they kept.)
(Each person will go home with whatever they kept.)
- (T1: No info.)*
(T2: No info.)
*(T3 (Good ranking): The UK is among the top 3 countries with the **best** climate change performance index, out of 58 countries. This index measures how well a country does with respect to emissions levels and trends.)*
*(T4 (Bad ranking): The UK is among the **worst** 3 countries in terms of total greenhouse gas emissions, in Europe. This is measured in million tonnes of CO₂ equivalents per year.)*

How much of the **£1**, if any, would you put into the box? Please try to answer the question as if the money were real.

£ _____

Please indicate in the *(second)* table below, how much money, if any, you would put into the box, given the average contribution of the other group members. Remember that each entry is a separate case, and for each entry, you can contribute any amount between £0 and £1.

(The first table below is to help determine your payoff based on how much money you put into the box and the average contribution of the other group members. [Table below only shown for Treatment 1.]

		Your Contribution										
		0	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
Average Contribution of the Other Group Members	0	1.00	0.94	0.88	0.82	0.76	0.70	0.64	0.58	0.52	0.46	0.40
	0.10	1.16	1.10	1.04	0.98	0.92	0.86	0.80	0.74	0.68	0.62	0.56
	0.20	1.32	1.26	1.20	1.14	1.08	1.02	0.96	0.90	0.84	0.78	0.72
	0.30	1.48	1.42	1.36	1.30	1.24	1.18	1.12	1.06	1.00	0.94	0.88
	0.40	1.64	1.58	1.52	1.46	1.40	1.34	1.28	1.22	1.16	1.10	1.04
	0.50	1.80	1.74	1.68	1.62	1.56	1.50	1.44	1.38	1.32	1.26	1.20
	0.60	1.96	1.90	1.84	1.78	1.72	1.66	1.60	1.54	1.48	1.42	1.36
	0.70	2.12	2.06	2.00	1.94	1.88	1.82	1.76	1.70	1.64	1.58	1.52
	0.80	2.28	2.22	2.16	2.10	2.04	1.98	1.92	1.86	1.80	1.74	1.68
	0.90	2.44	2.38	2.32	2.26	2.20	2.14	2.08	2.02	1.96	1.90	1.84
	1.00	2.60	2.54	2.48	2.42	2.36	2.30	2.24	2.18	2.12	2.06	2.00

Average contribution of the other group members	Money YOU put into the box
£0	
£0.10	
£0.20	
£0.30	
£0.40	
£0.50	
£0.60	
£0.70	
£0.80	
£0.90	
£1	

Now imagine that you are in a room with 4 other people and a researcher, but this time you are given **£1,000**:

1) Exactly like before, a box is passed around to each of the 5 people in the room (the researcher is excluded).

2) Each person may put all or any of the £1,000 into the box.

3) *(Treatment 1 (standard PGG): After the box goes around the room, the researcher **doubles** the money in the box and distributes it equally among each person in the room regardless of how much money they put into the box.)*

*(Treatment 2 (climate change): After the box goes around the room, the researcher **doubles** the money in the box which is then used to reduce CO₂ emissions.*

*(Treatment 3 (climate change): After the box goes around the room, the researcher **doubles** the money in the box which is then used to reduce CO₂ emissions.*

*(Treatment 4 (climate change): After the box goes around the room, the researcher **doubles** the money in the box which is then used to reduce CO₂ emissions.*

4) *(Each person will go home with whatever they kept plus what they received from the box.)*

(Each person will go home with whatever they kept.)

(Each person will go home with whatever they kept.)

(Each person will go home with whatever they kept.)

How much of the **£1,000**, if any, would you put into the box? Please try to answer the question as if the money were real.

£_____

Please indicate in the *(second)* table below, how much money, if any, you would put into the box, given the average contribution of the other group members. Remember that each entry is a separate case, and for each entry, you can contribute any amount between £0 and £1,000.

(The first table below is to help determine your payoff based on how much money you put into the box and the average contribution of the other group members. [Table below only shown for Treatment 1.]

		Your Contribution										
		0	100	200	300	400	500	600	700	800	900	1000
Average Contribution of the Other Group Members	0	1000	940	880	820	760	700	640	580	520	460	400
	100	1160	1100	1040	980	920	860	800	740	680	620	560
	200	1320	1260	1200	1140	1080	1020	960	900	840	780	720
	300	1480	1420	1360	1300	1240	1180	1120	1060	1000	940	880
	400	1640	1580	1520	1460	1400	1340	1280	1220	1160	1100	1040
	500	1800	1740	1680	1620	1560	1500	1440	1380	1320	1260	1200
	600	1960	1900	1840	1780	1720	1660	1600	1540	1480	1420	1360
	700	2120	2060	2000	1940	1880	1820	1760	1700	1640	1580	1520
	800	2280	2220	2160	2100	2040	1980	1920	1860	1800	1740	1680
	900	2440	2380	2320	2260	2200	2140	2080	2020	1960	1900	1840
	1000	2600	2540	2480	2420	2360	2300	2240	2180	2120	2060	2000

Average contribution of the other group members	Money YOU put into the box
£0	
£100	
£200	
£300	
£400	
£500	
£600	
£700	
£800	
£900	
£1,000	

Some questions about yourself.

Lastly, we would like to ask you some questions about you.

1) Nationality:

- English ☐
- Northern Irish ☐
- Irish ☐
- Scottish ☐
- Welsh ☐
- Other ☐

2) Are you:

- Single ☐
- Married ☐
- Cohabiting partnership ☐
- Divorced/Separated ☐
- Widowed ☐

3) Structure of your household:

Number of adults: _____

Number of children living at home: _____

4) Highest level of education completed:

- No education ☐
- Primary school ☐
- GCSE ☐
- A Levels ☐
- Foundation degree or equivalent ☐
- Bachelor's degree ☐
- Master's degree ☐
- PhD ☐

5) Are you (a):

- Employed full-time ☐
- Employed part-time ☐
- Self-employed ☐
- Retired ☐
- Unemployed ☐
- Homemaker/Looking after family ☐
- Student ☐

6) Which of the following do you consider yourself?

- Catholic ☐
- Orthodox ☐
- Protestant ☐
- Other Christian ☐
- Jewish ☐
- Muslim ☐
- Sikh ☐
- Buddhist ☐
- Hindu ☐
- Atheist (you believe there is no god) ☐
- Agnostic (you are not sure if there is a god) ☐
- Other ☐
- Prefer not to say ☐

7) Approximately how many miles do you live from the nearest coast: _____ miles

8) Do you smoke? Yes ☐ No ☐

9) Do you have a Facebook account? Yes ☐ No ☐

10) Are you, or anyone else in your household, a member of an environmental organisation?

- ☐ Yes
- ☐ No
- ☐ Don't know

11) Do you, or anyone else in your household, regularly buy "green" energy?

- ☐ Yes
- ☐ No
- ☐ Don't know

12) Do you or anyone in your household work in the energy sector? Yes ☐ No ☐

13) When people talk about politics, the terms left and right are usually used. Below there is a left-right axis. Where would you place yourself on this axis? Indicate it with an X.

Left					Right				
1	2	3	4	5	6	7	8	9	10

14) This survey is **anonymous** and the data will be confidential. With this in mind, could you tell me, **what is your gross (before tax) annual HOUSEHOLD income?**

- < £ 15,000 ☐
- £ 15,000- £ 23,500 ☐
- £ 23,501- £ 33,800 ☐
- £ 33,801- £ 48,000 ☐
- £ 48,001- £87,500 ☐
- £87,501+ ☐

Thank you for taking part in the study, please click "Submit" to finish the survey and record your answers.

The choices you selected will be confidential and will not be traceable to any individual by name. The data collected will only be used by the researchers who are analysing the data. By participating in the study you are helping researchers understand the value of **using seaweed as a source of green energy**.

Your data will be kept confidential and anonymous. If you have any further questions or queries please do not hesitate to contact the principal investigator Dr. [name left out for anonymity] ([email]).