


# Informing the development of Longitude 2014

Findings from public dialogue workshops and  
stakeholder event

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<b>Version</b>	FINAL	
<b>Approved on:</b>	5 February 2014	
<b>Signature:</b>		

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## Key findings

## Key findings

In October 2013, Nesta<sup>1</sup> with co-funding and support from the BIS<sup>2</sup> Innovation Directorate and Sciencewise<sup>3</sup>, commissioned Ipsos MORI to carry out research into public and stakeholder<sup>4</sup> views of Longitude 2014, including final prize challenges, prize challenge selection criteria, and achieving public engagement. The findings presented in this report will feed into the development of the Longitude 2014 prize.

### Project design

- 3 locations (Cambridge, Leeds, London).
- Two reconvened events in each location, each lasting three hours.
- 32 people attended the events, within a mixture of ages and gender and ethnicity broadly representative of each area. Longitude Committee members and other experts identified potential prize challenges and prize selection criteria which then were tested with the public. The public were also invited to suggest alternative challenges and criteria.
- 16 stakeholders attended an event held at the Science Museum, lasting three hours. In this event the findings from public dialogue workshops and expert views were presented and stakeholders were asked to debate these findings but not be constrained by them.

### Public and stakeholder prize challenge preferences

The research revealed that further development of prize challenges may be required prior to the process of shortlisting. The key points to consider are summarised below.

- **The committee should not feel constrained by the themes (i.e. challenge categories)** – although they were felt to be in broadly the right areas.
- **The prize selection criteria below drive prize challenge preferences**, and many felt finding a challenge that met these criteria was more important than which theme it fell in.

Prize selection criteria by each audience <sup>5</sup>	
The public's view	Stakeholder view
<b>Ambitious but solvable.</b> Longitude 2014 should reflect the scale and significance of the original Longitude prize.	<b>Specific, outcome focussed</b> prize challenges. This will help with the development of prize success metrics and stimulate innovator engagement.
<b>Interconnected.</b> Tackling or solving one challenge to help resolve other problems.	<b>Impact that makes a real difference</b> in society.
<b>Global reach.</b> Specifically, promoting global equality between developed and developing countries.	<b>Scaleable.</b> Final prize challenge shortlisting should consider issues such as practicality, and affordability to the end user.
<b>Benefit the whole of society.</b> Unless the prize has the potential to make a "life-changing" impact for specific groups.	The prize should stimulate <b>innovation that would not happen without the incentive of Longitude 2014.</b>

<sup>1</sup> Nesta is an innovation charity with a mission to help bring people and organisations bring ideas to life.

<sup>2</sup> The UK Department for Business, Innovation and Skills.

<sup>3</sup> Sciencewise is the UK's national centre for public dialogue in policy making involving science and technology issues.

<sup>4</sup> The term stakeholders is used throughout to describe individuals who participated in the post public dialogue event, but also to distinguish from experts whose input was gained via other channels e.g. Longitude Committee.

<sup>5</sup> Selection criteria are presented in order of salience and strength of feeling for each audience.

- Where technological solutions were included in the challenge description, **views of the technology rather than the challenge itself drove people's responses**. This is important to bear in mind when thinking about how challenges should be framed.
- Some participants **suggested alternative challenges**. They felt these have the potential to encourage engagement and increase the salience of less popular themes e.g. energy.

There was a **potential tension** between the public and stakeholder views pertaining to Nesta's suggested prize challenges. The public appear to favour global issues being tackled, whereas stakeholders prioritised challenges which were seen to have a direct impact on individual's lives e.g. health and wellbeing.

That said, public and stakeholder views did converge around certain issues (e.g. tackling dementia / Alzheimer's) but only when they were invited to suggest alternative challenges which they thought could be taken forward to subsequent stages of Longitude 2014. Below is a summary of the public and stakeholder views of Nesta's suggested challenges, and alternatives suggested by each audience.

	The public's view	Stakeholder view
<b>Challenges with most support<sup>6</sup></b>	Tackling food shortage Tackling malnutrition Tackling pollution and contamination Improving ecosystems Providing a reliable energy supply to all Helping people to live independent lives	Tackling antibiotic resistance Curing or reversing the effects of dementia Providing a reliable energy supply to all <sup>7</sup> Reducing energy usage in passenger transport
<b>Suggested alternatives</b>	Tackling Alzheimer's Mental health / blindness / "killer diseases" Combatting obesity Water shortage and quality	Energy storage Reduce dependence on oil in transport Resource and waste re-use Declining fish stocks Tackling marine eco-system degradation Tackling water acidification / desalination

## Capturing the public interest in Longitude 2014

Views of the public and stakeholders captured during the research suggest the following ideas would be effective triggers for driving engagement:

- **Stimulating interest** – it was felt that information about the details of the original and Longitude 2014 prizes would be attention grabbing and stimulate interest, specifically if it captured the ethos (open to all) and gravitas (significant impact) of the Longitude prize.
- **Making it personal** – it was suggested that if the public can be made to feel they have a stake in Longitude 2014, and be convinced it is relevant and important to their lives, this might prompt engagement. The public and stakeholders believed this would be dependent on the tone and framing of the Longitude 2014 messages.

<sup>6</sup> Analysis of detailed write-ups from public dialogue workshops and stakeholder event including verbatim quotations allowed report writers to systematically cross-check common themes and interesting outliers (i.e. views of the public where they differ from stakeholders) and understand the context and meaning of participants' comments.

<sup>7</sup> Presented to stakeholders as increasing provision of resilient energy.

## Engaging the science community and other innovators in Longitude 2014

The public dialogue was focussed on the things which might encourage the public to take part in the public debate and vote. Therefore ideas about engaging the science community and other innovators in Longitude 2014 tended to be expressed by stakeholders. Their views are summarised below.

- **Framing was seen as vital to encourage engagement.** Each problem and the desired outcome should be **specific but open to a range of solutions** to maximise response. Challenges should be framed in a **positive way** (i.e. 'promote equality' not 'address inequality') as this was seen to be more likely to work as a "call to action".
- **Publicising Longitude 2014 is also important to ensure maximum interest.** Explain how prize money will work across the different prize challenges so innovators know what to aim for and promote the **"hero status"** of Longitude winner so that it appeals to a wide audience.





# 1. Introduction

In October 2013, Nesta<sup>8</sup> with co-funding and support from the BIS<sup>9</sup> Innovation Directorate and Sciencewise<sup>10</sup> commissioned Ipsos MORI to carry out research into public and stakeholder views of Longitude 2014, including final prize challenges, prize challenge selection criteria, and achieving public engagement. The findings presented in this report will feed into the development of Longitude 2014.

## 1.1 Background

The **original Longitude Prize** sought a solution to one of the great challenges of the day – to enable accurate calculation of longitude at sea – to enable global trade and avoid shipping tragedies. The prize, valued at £15 million in today's terms, was won by a watchmaker - John Harrison - who created the marine chronometer.

Nesta hopes, 300 years on, that **Longitude 2014** will be a ground-breaking global challenge prize, which will catalyse an 'ideas race' for innovations that solve publicly important challenges. The public will help to decide what the main challenge prize should be.

In April 2013, Longitude 2014 began with a meeting at 10 Downing Street. A group of the UK's most eminent scientists met at No.10 to discuss ideas that could be presented to the public for a new world leading challenge prize. Following this, the Prime Minister announced the UK's intention to recreate the Longitude Prize. The **Longitude Committee**<sup>11</sup>, chaired by Lord Martin Rees, and backed by leading scientists, major foundations and the UK government, will use insight of experts and the public to shortlist prize challenges.

## 1.2 Overview of Longitude 2014 project

The overall programme of work is illustrated in the diagram overleaf.<sup>12</sup> The stages of the Longitude 2014 project are as follows:

### Stage 1

1. Seven potential prize categories (i.e. themes) and a series of potential prize challenges were identified by Longitude committee members.
2. Building on this scoping work, insight gained from Longitude subcommittee meetings chaired, in almost all cases, by an appropriate Longitude committee member, and interviews with other experts developed further the list of challenges within each theme. This output informed materials used during public dialogue workshops.
3. Between the public dialogue workshops and the stakeholder event, discussions between Longitude committee members and other experts led to further iterations of potential prize challenges. To reflect these changes, Ipsos MORI in collaboration with Nesta amended the wording of a small number of potential prize challenges while some were replaced in the stimulus presented to the stakeholder event. However, almost all prize challenges presented to the public were retained so that, in so far as possible, stakeholders and the public commented on similar issues.

<sup>8</sup> Nesta is an innovation charity with a mission to help bring people and organisations bring ideas to life

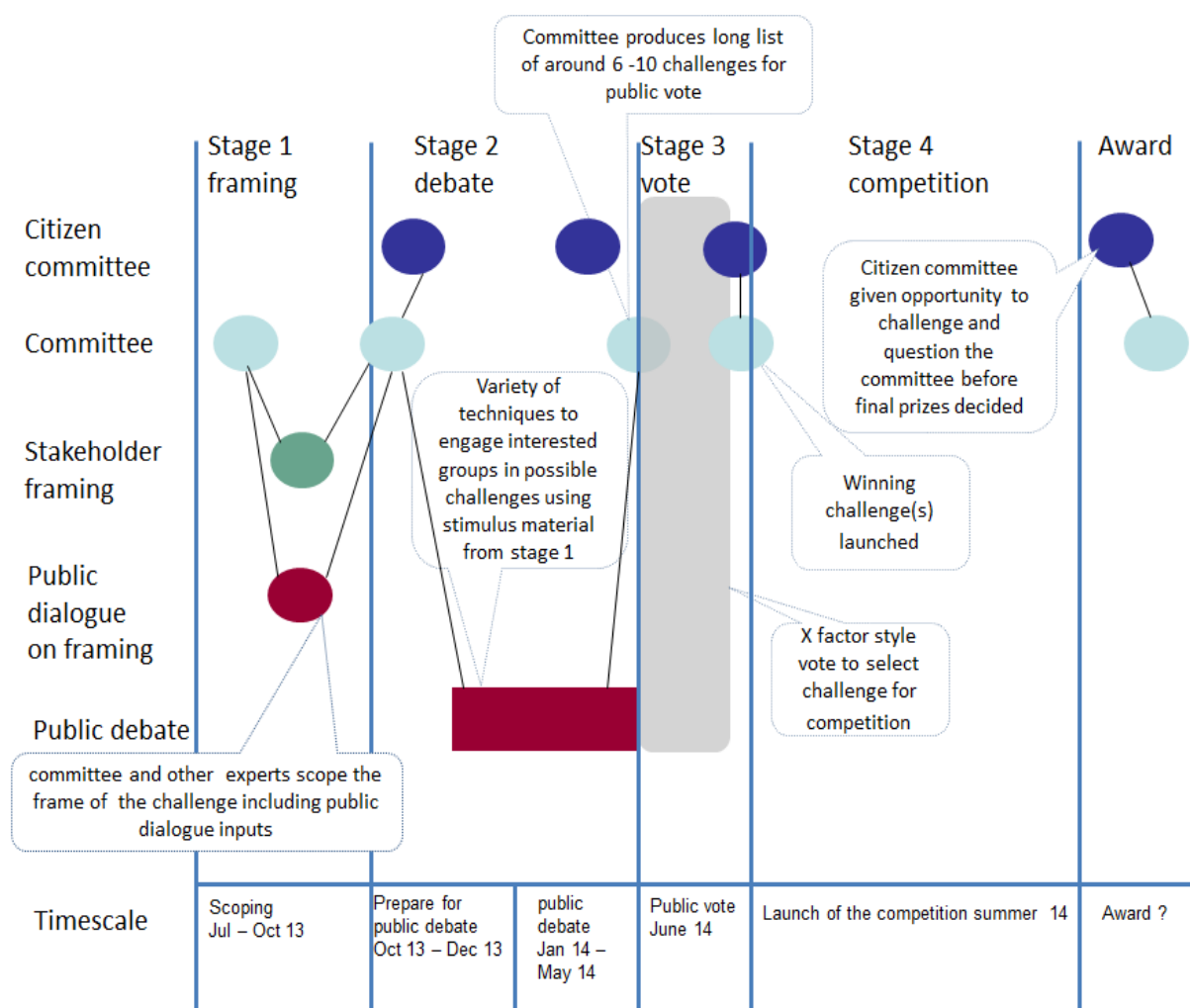
<sup>9</sup> The UK Department for Business, Innovation and Skills.

<sup>10</sup> Sciencewise is the UK's national centre for public dialogue in policy making involving science and technology issues.

<sup>11</sup> Details of committee membership are published in a separate annex.

<sup>12</sup> Nesta anticipates that stage 2, 3 and 4 will also include public dialogue processes but will be contracted at a later date. There is also the potential that following stage 1 the subsequent phases could be reviewed and altered.

4. During the stakeholder event, findings from public dialogue and discussion with experts were presented and stakeholders were asked to consider those findings but not be constrained by them. Findings from this research and on-going discussion with experts and other stakeholders will inform decisions taken by the Longitude Committee (stage 2).



## Stage 2

The Longitude Committee will use the outputs of stage 1 to agree an evaluation process and shortlist a number of prize challenges. These will be used as part of a public debate to stimulate public interest in Longitude 2014 and science and innovation more generally.

## Stage 3

A high profile public vote will select the primary Longitude prize challenge (and a series of secondary prize challenges) to be solved by the science community and other innovators.

## Stage 4 and 5

Nesta anticipates that the public will remain involved as the project enters stages 4 and 5 via a Longitude citizen committee that will be set up to shadow the work of the Longitude committee.

## 1.3 Objectives

The public dialogue and stakeholder consultation outlined in stage 1 was undertaken on behalf of Nesta with co-funding and support from the BIS Innovation Directorate and from Sciencewise. The

research aimed to understand what the public and stakeholders consider to be worthy prize challenges for Longitude 2014. Findings from the public dialogue and stakeholder consultation will help inform the development of Longitude 2014.

The following aims were considered throughout this dialogue

- To ensure through consultation with stakeholders and dialogue with the public that the public voice informs the scope and framing of a new Longitude prize for innovation in science and technology.
- To ensure that there is a high degree of transparency around the process for developing longitude challenges.
- To ensure that the outcomes from the stakeholder workshop and public dialogue frame and develop specific ideas and topics for potential challenges under each theme.

Additionally, a set of secondary objectives were drawn up, namely:

- To frame and develop ideas and topics for potential challenges under each challenge theme.
- To understand public response to each theme and challenge.
- To develop new potential ideas for prize challenges / themes.
- To understand language and priorities of the general public.

## 1.4 Methodology

Public dialogue allows participants the freedom to express the issues that are salient to them as well as to respond to stimulus and gather information at their own pace about complex issues; it allows them to draw in information from facilitators; plus it allows participants to think about their own perspective, deliberate with others, and consider the views of other groups in society.

Evening (3-hour) reconvened workshops (conducted in three different locations) allowed participants enough time to express their spontaneous views about the development of Longitude 2014 and reflect on issues pertaining to a variety of potential prize challenges, prize selection criteria, and prize engagement. The public were also shown a film which gave them information about the original Longitude prize and the aims of the current one. This served two purposes. First, it encouraged the public to think about societal issues through the lens of a science and technology prize; and second, it also helped them to think about potential prize selection criteria.

The workshops were deliberative in nature and participants were given information about what is involved in Longitude 2014 e.g. public debate and vote. Participants were encouraged to develop their views in light of the information provided and to debate and vote as the workshops progressed.

Following the public dialogue workshops, Ipsos MORI and Nesta convened stakeholders to a 3 hour workshop held at the Science Museum's Dana Centre in South Kensington, London. The workshop allowed stakeholders time to consider findings from the public dialogue as well as additional insight gained from concurrent discussion with experts with regard to potential prize selection criteria and prize challenges.

The research materials - including examples of potential prize challenges and prize selection criteria presented during the public dialogue workshops and stakeholder event, and discussion guides - are published in a separate annex.

Events were held between 24<sup>th</sup> October and 7<sup>th</sup> November 2013.

## 1.5 Sample

Participants were recruited by specialist qualitative Ipsos MORI recruiters. Recruitment was carried out face-to-face on the street. In each location (Cambridge, Leeds and London) 12 people were recruited to allow for some drop-out over the process. 32 participated in both events. Quotas were set for gender, age, socio-economic group and ethnicity to ensure participation of individuals from a range of backgrounds, reflective of the areas they came from and of the broad diversity of the UK population. In Cambridge, participants were recruited to be younger (18-25 years) to ensure that we fully captured the views of younger people who might have felt less confident in a discussion with older people.

Screening questions based on scientific interest and creativity were also set and people not interested in science were screened out during recruitment. This was done to ensure people were willing to engage with the topic and would reflect people who could potentially be interested in any public engagement around the prize. The views of Longitude Committee members, and other experts were included in the research by a process of stakeholder engagement undertaken by Nesta prior to the drafting of the workshop materials (see section on materials below).

Participants received a financial incentive to encourage participation in the workshops.

## 1.6 Materials development

Drawing on the descriptions of different societal challenges and potential technological solutions developed by Nesta and experts engaged via the Longitude Committee, stimulus materials were designed to test potential prize challenges with the public. The wording of many of the issues had to be simplified as it was too complicated to use with the public, but without changing the scope and meaning of the issues. To ensure that this was achieved, Ipsos MORI worked collaboratively with Nesta's Centre for Prize Challenges and Sciencewise, and Anna Beckett, Head of Central Government Research at Ipsos MORI was responsible for internal sign-off of materials. All materials were then signed off by Sciencewise and Nesta, whose insight of the Longitude Committee's on-going work ensured a final sense-check.<sup>13</sup>

## 1.7 A note on interpretation of qualitative data

Qualitative research approaches (including public dialogue workshops) are used to shed light on *why* people hold particular views, rather than *how many* people hold those views. The research is intended to be illustrative rather than statistically reliable and, as such, does not permit conclusions to be drawn about the extent to which something is happening. In the case of this study, we intended to develop an in-depth understanding of views of Longitude 2014, including suggestions for final prize challenges and what public engagement should look like. Where possible we have stated how common a particular view was amongst participants, but as this is qualitative research, these proportions should be considered indicative, rather than exact.

Throughout the report, verbatim comments have been included to illustrate particular viewpoints. Where this is the case, it is important to remember that the views expressed do not always represent the views of all participants. In general, however, verbatim comments have been included to illustrate where there was a particular strength of feeling about a particular topic.

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<sup>13</sup> An overview of the process of materials development is published in a separate annex.

# Views of challenges facing society



creation or investment in infrastructure (e.g. housing, schools, hospitals) to support the existing population, let alone the estimated rise of 10 million people by 2040.<sup>16</sup>

With regard to the **ageing population**, people often described a tension between their perception of existing pressure on health and social care services, combined with society's expectation of **quality of life and well-being** in later life. Many were also worried about **health related matters** such as disease e.g. cancer and other "killer diseases".

### Concern about the world I live in

The public also reflected on issues which had more of a global dimension. Overall there was a strongly held view that we are about to reach where a point where **unless urgent action is taken the effect of these issues will snowball into even bigger problems** (e.g. war and conflict caused by competition over diminishing resources). Many took a rather pessimistic view when discussing global issues. They believed that many of these issues were unlikely to be addressed to the extent they would like due to a lack of political will and the belief they had not seen evidence of significant progress despite certain global issues being focussed upon for decades e.g. **environmental degradation**.

The public also described their concerns about the world in which they live from an economic standpoint. Here, some spoke about "global inequality", though this was mostly expressed in terms of addressing **disparity between developing and developed countries**. Many believed that tackling food and water shortages and disease in those countries would help drive economic development.

### Implications for Longitude 2014

Findings from this initial discussion provide an indication of what sort of issues the public felt should be taken forward to subsequent phases of Longitude 2014. These are summarised below, and discussed in detail in sections 3 (views of Nesta's suggested themes and challenges) and 4 (views of prize selection criteria).

With the exception of problems that had a solely economic dimension (e.g. income inequality between different groups in society) many of the **reported societal challenges reflect Nesta's suggested themes and challenges**. These issues, therefore, have the potential to engage provided they are presented in the right way (see section 5).

**The public were also concerned about global issues.** The public felt urgent action is needed to tackle inequality and to avoid damaging and irreversible effects upon the planet. And there is **some appetite among the public for science and technology to play a role in helping to solve these issues** as the public are sceptical about the effectiveness of existing mechanisms (e.g. political will) to solve many of them. However, this is dependent on public acceptance of utilising science and technology in less familiar or contentious areas. Young people in particular expressed genuine enthusiasm about technological developments that can help to tackle these longstanding problems provided they have a "wow" factor and risk is managed. Despite some being concerned about the extent to which certain technologies might be used in every-day life they were open to the prize starting a debate.

<sup>16</sup> [http://www.ons.gov.uk/ons/dcp171778\\_334975.pdf](http://www.ons.gov.uk/ons/dcp171778_334975.pdf)

# Views of Nesta's suggested themes and challenges



### 3. Views of Nesta's suggested themes and challenges

This section draws together the views of the public and stakeholders to illustrate reaction to potential themes and challenges. It also discusses the factors underpinning the arguments around whether or not they should be taken forward to the public debate.

#### 3.1 Themes presented to the public and stakeholders

Workshops with the public and stakeholders involved eliciting views on Nesta's six suggested thematic areas and potential prize challenges therein. The six themes were:

- Health and wellbeing
- Access to communication technology
- Energy
- Environment
- Global development and food security
- Technology and robotics for enhanced living

To ensure the public and stakeholders could debate each theme and decide which challenges, if any, should be taken forward to the public debate, they were presented with information which explained some of the factors which can lead to the problem occurring e.g. inequality of access to communication technology can be caused by disability, skill-level, language. Examples of technological solutions and potential benefits were presented to the public to explain why a science prize might be the right response. Potential prize challenges presented to the public and stakeholders are published in a separate annex.

Figure 2: An example of the stimulus material presented in the public dialogue workshops.

**Tackling malnutrition** **Nesta...**

**The problem**

- Food shortages affecting 2 billion people are being made worse by rising food prices; and
- Poor feeding practices (e.g. people given wrong types of food)
- Infections (e.g. diarrhoea) can mean that food alone isn't the solution

**Why might the prize be the right response**

- Might increase the potential of other solutions:
  - Sanitary solutions for people without access to toilets
  - Improvements in computer modelling to predict famine

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To ensure the public were not constrained by the expert's suggested themes and potential challenges, they were invited by Ipsos MORI researchers to suggest alternative societal challenges which could be solved by Longitude 2014. Equally, stakeholders were invited to suggest alternatives. Below we present a summary of the public and stakeholder views of Nesta's suggested themes and each challenge as well as any suggested alternatives. We have used icons to help the reader distinguish between the views of each audience (see example below).

### The global development and food security theme



The Public



Stakeholders

Themes and challenges therein are ordered based on strength of feeling and salience amongst the public. A summary of prize challenges seen as most important by each audience is at the end of this section.

## 3.2 Global development and food security

The four challenges challenge presented to the public and stakeholders under this theme were:

- Tackling malnutrition<sup>17</sup>
- Feeding a larger and wealthier population<sup>18</sup>
- Providing a reliable energy supply to all<sup>19</sup>
- Reducing the impact of natural disasters on communities

### The global development and food security theme



The theme of global development and food security proved to be popular in the public dialogue workshops, though the public mostly discussed food security thorough the lens of food shortage. They did not think that world hunger or malnutrition could be eradicated within the Longitude timescale, but they assumed substantive progress could be made.

They felt that a prize challenge related to tackling food shortages would have multiple benefits:

- **Drive economic development** in affected countries, thus helping to tackle poverty.
- **Boost social and cultural development** – they presumed if people were not starving this would increase the likelihood of them participating in learning and / or acquiring new skills.
- **Promote global equality** between developing and developed countries.

*"I think malnutrition is a major one because it's not fair that we're so far ahead and other countries are so far behind"*

<sup>17</sup> Presented to stakeholders as combatting malnutrition: making agriculture more productive, sustainable and nutritious

<sup>18</sup> To convey the latest thinking of Longitude subcommittee members this challenge was not presented to stakeholders

<sup>19</sup> Presented to stakeholders as increasing provision of resilient energy

## The global development and food security theme



While stakeholders acknowledged the importance of global development and food security, some felt that the Longitude 2014 prize was perhaps not the right mechanism in which to tackle these challenges as they thought political will was the main barrier to success. That said, there was **widespread support for one global development related challenge: increasing provision of resilient energy to all, which they felt should be shortlisted.**

## Tackling malnutrition



The consensus among the public was that this is a serious problem, affecting significant numbers of people, and is an issue which has already captured public attention due to on-going media coverage. **Many public participants agreed it was worth taking forward.** Despite this challenge being framed as “combatting” malnutrition, stakeholders discussed the extent to which it could be solved within Longitude’s proposed ten year timescale. Consequently, **stakeholders questioned whether this challenge should be shortlisted.** Additional findings are summarised below.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Tackling the issue can have multiple impacts e.g. boost economic development thus close the gap between rich and poor countries	Based on contextual information given, some stakeholders felt that as developing countries become wealthier a key cause of malnutrition (lack of sanitary conditions) would be addressed as people improved their own homes
Concern that global food prices will exacerbate this issue thus it requires urgent action	

## Feeding a larger and wealthier population



**Food shortage was thought to be a key priority for Longitude, though the public often discussed it in relation to developing countries.** Reflecting on potential solutions, some participants in the public workshops wanted a prize challenge that focussed on better resource management and recycling waste.<sup>20</sup> Additional findings are summarised below.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Public presumed it will be more difficult to feed the planet due to rising food prices	Some said they would prefer a prize challenge that would ensure people ate nutritious, “quality”, organic food rather than encouraging the development of scientifically enhanced crops which were seen as less ‘natural’

<sup>20</sup> While this challenge was not presented to stakeholders, they also raised the point about resource management and recycling waste during a more general discussion on global development.

## Providing a reliable energy supply to all



The public felt a reliable energy supply was important as they considered it to be a basic necessity in everyday life. It became even more salient when they reflected upon information that was presented. For example, the fact that almost half the world's population live without reliable energy supply, and the idea that **solving this challenge might help those in poverty, meant for some that it should be taken to public debate**. On reflection, however, a few were unsure because they assumed solving this issue may have unintended, negative consequences. They thought the reliable energy supply would be sourced from power generated by fossil fuels (coal, oil or gas) which when released would exacerbate the effects of climate change.

Increasing the provision of resilient energy **appealed to stakeholders, especially when they considered potential solutions**. They reasoned that this sort of well-defined, outcome focussed challenge could deliver a broad range of solutions including household appliances which are powered by renewables and /or more efficient ways to store energy. Additional findings are summarised below.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Tackling one of the causes of poverty resonated with the public and stakeholders	Public thought that energy companies which make excessive profits should not be the main beneficiary of an energy prize challenge
Information triggered an emotional response i.e. 2 out of 5 people still rely on wood	Stakeholders felt that the provision of energy supply is dependent on political will

## Reducing the impact of natural disasters on communities



This challenge initially engaged people's interest, but on reflection they decided that it was unclear how science and technology would be able to make a significant difference. Other members of the public, who were concerned about the effects of climate change, said it was **vital that society increases its capacity and ability to deal with such events**. They also said, however, that the priority should be tackling the causes of global warming. A couple of stakeholders advocated the need for investment in disaster modelling. Other stakeholders did not engage with this challenge.

### 3.3 Environment

The three challenges presented to the public and stakeholders under this theme were:

- Tackling pollution and contamination<sup>21</sup>
- Improving our eco-systems<sup>22</sup>
- Reducing the use of Nitrogen

To convey the latest thinking of Longitude subcommittee members, stakeholders were presented with two additional challenges:

- Increasing biomass for bioenergy
- Need for predictive tools for better environmental interventions



#### The environment theme

Along with global development and food security, the environment theme proved to be most popular with the public. Participant's concern about the environment was widespread and often was used throughout the public dialogue to **benchmark the seriousness of other themes and challenges, and draw conclusions on which challenges should be shortlisted**. Indeed participants said they would want the causes of environmental damage to be tackled by Longitude 2014. They felt that tackling an issue like pollution and contamination would mitigate eco-system damage and concluded then that the **impact of the prize could be maximised as just one solution could have a myriad of benefits**. That said, some were disappointed when some of the potential solutions were presented as they felt they fell short of what was required to tackle environmental challenges.



#### The environment theme

The thought of having a prize challenge in this theme appealed to stakeholders as they said the issue was important in itself, but also because the challenges were so familiar it would stimulate engagement. But **when presented with the challenges stakeholders were critical of the things which they saw**.

*"I really wanted to stand by environment, but no challenge struck me".*

In terms of engagement, some of the challenges were criticised for not being easy to understand e.g. predictive tools for environmental interventions, and when asked they said more succinct phrasing would still not make it appeal. Stakeholders suggested this theme would be **strengthened if it included challenges which the public find stimulating, are easy to understand, and will make a real difference**. Their suggested alternatives included waste management and resource re-use. They also suggested "better eco-system management" could be re-framed to focus on fish stocks, marine pollution, or water acidification / desalination as they felt these issues would resonate.

<sup>21</sup> Presented to stakeholders as tackling urban air pollution.

<sup>22</sup> Presented to stakeholders as better eco-system management.

As presented, stakeholders thought that none of the environmental challenges should be taken forward to public debate. However, they felt that **if improvements were made in the light of their views then the theme should not be discounted.**

*“Shame to lose environment but I don’t like the way in which they are framed.”*

### Tackling pollution and contamination



The public thought that **tackling pollution and contamination required urgent action** and wanted this challenge to be shortlisted. In discussion they deliberated on the causes of pollution including intensive agriculture and urbanisation and predicted **its consequences would become more problematic due to the necessity to house and feed a growing global population.** The public wanted more information about which issues would be tackled because things like soil and coastal erosion, deforestation, declining fish stocks were all felt to be important. While stakeholders **acknowledged the importance of urban air pollution they felt other causes of pollution were more engaging.** Additional findings are summarised below.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Given the stimulus suggested a key cause was agriculture pollutants, many felt this could be re-framed and merged with “reducing the use of nitrogen”	Some participants felt that tackling pollution and contamination was too vague

### Improving our eco-systems



**This challenge also gained widespread public support amongst the public.** However, almost all were disappointed with examples of solutions which were presented to them e.g. “re-wilding”. They therefore began to hypothesise about different measures which they felt could be taken to avoid eco-systems damage in the first place e.g. better land-use planning. Some felt this challenge could be tackled in large part by education to encourage people to think and behave in ways which are more environmentally friendly, and therefore were unclear whether it was a suitable Longitude 2014 challenge.

Again stakeholders were critical of the framing of this challenge. Often, but not always, they thought in terms of what might engage the public and **some felt that issues related to overfishing and marine management would be more pertinent to the public.**

*“I think there is a great opportunity here as marine and fish stocks have people’s imagination.”*

Additional findings are summarised overleaf.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
When explained people liked the idea of “re-reconstructed land”	Public did not feel that “re-wilding” would have a substantive impact
Some appetite amongst the public for a prize challenge focussed on GM food based on the view “it was about time the debate was had”. They assumed from the stimulus that GM food could potentially divert food production to marginal land and lead to an improvement in ecosystems	Stakeholders felt this challenge was too broad and suggested “it should come down a level”

### Reducing the use of Nitrogen



The public did not immediately see the importance of this challenge. It did resonate once the negative impacts of man-made nitrogen were explained (e.g. global warming, water quality etc.) **as then people assumed solving this challenge could help tackle a myriad of problems.** In terms of the solution presented (i.e. plants that generate their own nitrogen), most assumed this involved genetic modification but nevertheless felt it was interesting, and **a few suggested this was an example of “cutting edge” science and technology.** Even those who adopted a more cautionary tone in relation to GM began to consider wider applications such as feeding a growing population with fewer pollutants. They concluded this challenge would **be worthy of Longitude 2104 despite the fact those solutions might be contentious.** Additional findings are summarised below.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
The public felt this challenges could encourage a public debate about GM food	Public concern that solutions may reduce food productivity, when they believe the opposite is needed
Many want fewer chemical pollutants in the environment	Perception of a contradiction between GM and improving the natural environment

### Increasing biomass for bioenergy



Overall stakeholders did not engage with increasing biomass for bioenergy. They felt it would not be engaging for the public. Also, they suggested that research and investment in this area was widespread, and therefore concluded Longitude 2014 would not be the right response.

### The need for predictive tools for better environmental interventions



This challenge was also criticised by stakeholders. The main concern was lack of clarity as even with stimulus many asked for clarification. Once explained, many did acknowledge its inherent value, but they felt it fell short on several of their prize selection criteria for example a specific, well defined problem which did not require explanation.

### 3.4 Health and wellbeing

The five challenges presented to the public under this theme were:<sup>23</sup>

- curing or reversing the effects of dementia
- helping people to live independent lives
- tackling antibiotic resistance
- reducing alcohol and drug addiction
- preventing or delaying onset of Type 1 diabetes

#### The health and wellbeing theme



The health and wellbeing theme proved to be one of the most popular themes across all locations because of concern about an ageing population and the extra pressure this would put on health and social care systems. Other issues such as obesity and mental health were said to also require urgent attention to avoid a “health crisis” in the foreseeable future. However, when participants thought about the **organisations that might win a health prize** many said they did not want pharmaceutical companies that are already making “huge profits” to profit further from a prize.

However, as people began to reflect upon the challenges, many became concerned about the extent to which science and technology might be relied upon with regard to people’s health. Indeed, some felt Longitude 2014 might result in the expansion of technology across the health and social care sector in an attempt to meet the needs of an ageing population. People were concerned about this as they often made an **association between the use of technology and fewer face-to-face interactions** with health and social care professionals.

Others **criticised the challenges under this theme for not being ambitious enough**. Many said it did not make sense that “killer diseases” such as AIDS, cancer, and malaria or other health conditions like blindness had not been presented to them when diabetes had.

Finally, opinion on whether or not there should be health related prize challenges was often based on views about who in society should benefit from Longitude 2014. The majority view was that the whole of society should benefit.

#### The health and wellbeing theme



The health and wellbeing theme resonated with stakeholders for a variety of reasons, namely:

- The issue had immediacy and thus required urgent action – e.g. the challenge of an ageing population was “top-of-mind”.
- It was seen to have a direct and immediate impact upon individual’s lives, especially when they compared challenges across themes e.g. environment.
- The framing of many of the challenges appealed which was seen to be favourable for public and innovator engagement.

<sup>23</sup> To reflect the latest thinking of Longitude Committee members about potential prize challenges, stakeholders were asked to debate on the first four of these challenges.



**Unlike the public they did not bemoan a lack of ambition.** They felt there was already substantive research and investment into tackling AIDS, cancer and malaria, from other sources so they considered other health related challenges to be a priority.

### Curing or reversing the effects of dementia



The **issue of dementia resonated amongst many public participants**, though most were unsure what dementia encompassed and suggested it would be better if it was framed as “tackling the effects of Alzheimer’s” as they felt this would be easier for the public to understand. **Stakeholders recognised the link between dementia and an ageing population and agreed it should be shortlisted.**

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Quality of life in later life valued enormously	Public assumed this challenge is more significant in the developed world and there was appetite for solutions that have global impact
Despite initial reservations, memory aids and implant technology were viewed positively by many	Concern about certain technologies being unavailable to the less well off
Viewed as a growing problem which will have direct and indirect effect on the whole of society	Brain stimulation via the use of drugs was considered a “step-to-far” by the public if about making “superhumans” rather than medicine

### Helping people to live independent lives



The public need assurances about the role of science and technology to help people live independent lives. Concerns were centred on two situations. First, an elderly person’s lack of preparedness to adapt to technology which some assumed could result in people being harmed. Second, reliance on technology might result in a person becoming isolated. **Despite these reservations many felt this challenge should be taken forward to public debate.**

This challenge also appealed to stakeholders as they too recognised that increasingly more people will want to live at home. However, they acknowledged that **decisions about who is given technological developments and under what circumstances are contentious** and therefore felt this challenge would need to be carefully considered during the process of shortlisting. Additional findings are summarised below.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Potential to deliver a variety of solutions to have “life-changing” impact	Assurances needed that people are capable of leading independent lives in case technology fails
Some thought it would reduce pressure on an already stretched health and social care system	

## Tackling antibiotic resistance



The public have very limited knowledge about antibiotic resistance and **wanted to know how it could be that “in this day and age” there had been no new antibiotics discovered since the 1980s.** Without compelling information on how antibiotic resistance impacts upon society which could counter their preconceptions (e.g. evidence for the impact on life expectancy or number of deaths) it was evident that **the public did not immediately understand why this challenge would be important.** While its seriousness was acknowledged simply by the fact it was being presented to them, most participants felt others issues within health and across other themes were considerably more important.

**In contrast, many stakeholders said this was one of the most important challenges and should be taken forward to the public debate provided the public were informed about its societal impact.** Some suggested people could be informed about the importance of developing new antibiotics to guard against emergent zoonotic diseases like SARS. It was also liked because the challenge fitted with key aspects of their prize selection criteria for example it was specific, well-defined with a clear outcome which they presumed would encourage a range of solutions.

*“Antibiotics one is nice and easy to explain and takes 20sec to say why it is important”*

Additional findings are summarised below.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Raising public awareness about the misuse of antibiotics appealed to the public and stakeholders	Without explanation, public did not recognise the importance of this challenge
It was seen as interesting simply because it was unfamiliar to the public	The public did not want pharma to profit from the prize

## Preventing or delaying onset of Type 1 diabetes



It was evident in the way the public discussed the different factors which can cause diabetes that they mis-understood this challenge as preventing Type 2 diabetes. Even when it was explained the causes are genetic rather than lifestyle, **many participants continued to point to their concern about obesity.** Additional findings are summarised below.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Misunderstood the causes so they believed Type 1 diabetes affects an increasingly large proportion of society	Some participants thought the biomarker would be unworkable. They presumed everyone in society would need to be tested for diabetes

## Reducing alcohol and drug addiction



**Neither the public nor stakeholders thought that reducing alcohol and drug addiction should be taken forward to the public debate.** While there was some acceptance of certain contentious issues like GM foods being shortlisted, both the public and stakeholders suggested this challenge was perhaps too controversial for other members of the public. Others simply disliked the idea of helping people whose choice they said it was to be drug or alcohol dependent.

*“People choose to take drugs and if they wanted to change it, they change it.”*

Some did not adopt such a moral standpoint but they were still against the idea because for them the issue did not “fit the spirit of the original Longitude prize.” Additional findings are summarised below.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Perception that austerity has reduced the provision of services for addicts, therefore new cost effective solutions are required	Stakeholders said a variety of treatments and procedures to curb addiction are already in place
Stakeholders felt tackling addiction would indirectly benefit the whole of society	Addiction not seen as solvable via technological solutions

## 3.5 Energy

The three challenges presented to the public and stakeholders under this theme were:

- Keeping the lights on while reducing carbon emissions
- Improving home energy use
- Reducing energy usage in passenger transport



### The energy theme

The theme of energy **initially resonated with the general public but it became less popular when potential prize challenges were introduced.**

The theme initially appealed to the public because:

- There is widespread concern about the rising cost of energy to power people’s homes and transport.
- Many presumed this theme was suited to a science and technology prize.
- It is seen to require urgent action as people are concerned about the end of fossil fuels.

The idea of tackling energy related issues e.g. CO<sub>2</sub> emissions appealed because the public felt that if these **issues had more publicity via public debate it would force the Government’s hand to take more substantive action.** However, many were critical of the potential prize challenges for being not **ambitious enough**, and nor did they consider them to be particularly interesting or engaging (e.g. reducing home energy use).

Some felt that **technologies were already in place or would be in the foreseeable future** which made them reconsider whether a science prize was the right response. For example, they mentioned recent announcements by car manufacturers about the roll-out of electric cars within a decade.

*“If we’re fairly well travelled in this direction, is this a priority?”*

Others said the suggested solutions were problematic as they **could not foresee how they would be rolled-out** to have the kind of substantive impact that would make a real difference. Indeed many were unsure how energy efficiency measures could be retro-fitted to the UK’s existing house stock.

## The energy theme



**The idea of having a prize challenge in this theme proved popular with stakeholders as they felt it could stimulate interest amongst the public** provided the theme could be framed in terms of technologies that can mitigate the impact of rising energy bills while helping the UK to meet its carbon reduction targets.

*“You’re saving yourself money but you’re also doing something for the environment.”*

Irrespective of the potential benefits of solving energy related problems, stakeholders felt shortlisting any challenges in this area would need to be carefully considered as they felt that issues like world hunger would almost always be voted for by the public because of the perception they *should* be prioritised.

## Keeping the lights on while reducing carbon emissions



**This challenge was salient with the public as a reliable energy supply was seen as a basic necessity.** However, reflecting on information presented, many assumed it was unlikely the challenge could be met via local renewable energy initiatives. Despite this, **stakeholders thought the development of more efficient ways of storing energy should be shortlisted as a prize challenge.** They recognised it might not be seen as particularly exciting to the public but nevertheless felt it has the **potential to engage if presented in the right way, for example reducing household expenditure on energy.** Additional findings are summarised below:

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Many felt that tackling the causes of climate change (e.g. carbon emissions) requires urgent action	Local renewables not seen as affordable or scaleable
Some participants said it met their prize selection criteria i.e. global impact	Public felt solutions <sup>24</sup> presented to them weren’t ambitious enough; suggested alternatives included nuclear fusion

<sup>24</sup> As noted elsewhere, to help the public understand the challenges, example solutions were given.

## Improving home energy use



Given the current pressure on household costs **due to rising energy costs this challenge resonated with some of the public**. However, some felt a prize might not be the right response as they felt it was the Government's responsibility to deliver more energy efficient homes. While stakeholders acknowledged the importance reducing carbon emissions **they were concerned that certain solutions would not engage the public e.g. new types of insulation**. Additional findings are summarised below:

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Public interest in solar panels and insulation as means to reduce energy bills in the medium to long term	Not seen as doable because of the cost to retrofit existing housing stock
Fairly easy to measure prize success (e.g. energy usage)	Both the public and stakeholders felt the potential solutions did not stimulate interest

## Reducing energy usage in passenger transport



Overall stakeholders felt this challenge might be a "hard-sell" to the public. However they did acknowledge the challenge itself has merit in that it fitted with their prize selection criteria: **specific and outcome focussed** and **has the potential for a variety of technological solutions**. One stakeholder suggested an alternative description "reducing dependence on oil in transport".

**The public thought this problem would be solved by the market, and therefore thought it would not make a worthy prize challenge**. They believed private companies would produce more energy efficient vehicles as society looks to cut the cost of travel in the light of rising oil prices. Additional findings are summarised below:

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Stakeholders said it would be good if it could help reduce the energy costs embedded in the production of vehicles	Solutions happening anyway e.g. improved battery life likely to result in electric cars becoming widely adopted

### 3.6 Access to communication technology

The two challenges presented to the public and stakeholders under this theme were:

- Helping people to access digital communications
- Strengthening online identities and cyber security

#### The access to communication technology theme



Discussion with the public revealed there are shortcomings with the framing of this theme, since it was not immediately obvious to participants how its impact would be felt by society. Even after extra information was given, **participants questioned the seriousness of this societal challenge** and provided a range of factors which they said convinced them that other themes ought to be tackled by the Longitude prize.

First, there was a widespread view that **longstanding issues** such as tackling food shortages and disease, rather than recent phenomenon (i.e. online access) **should be priority**, despite the recognition that online access “in this day and age” is important.

*“Diseases have been around for years and years – let’s tackle the long standing issues first”.*

Second, **the theme did not trigger the sort of emotional response** observed during discussion of other themes like global development. Indeed, participants spoke about people in developing countries being impacted by poverty or water shortage then compared this with accounts of rising smartphone ownership in those countries as evidence this theme should not be the focus of the Longitude prize. This theme also proved unpopular because the public were concerned that the **cost of potential solutions** e.g. satellite link would be so expensive that they would only be affordable to the well off in society, and as discussed in section 4 the public want Longitude 2014 to promote equality.

Third, participants believed this challenge could be **resolved by private investment and market intervention** and did not, therefore, require a prize incentive. Some believed there are existing technological developments (e.g. Google translate) which are helping to tackle some of the causes of inequality of access e.g. language skills. Others felt the speed at which technology evolves is likely to result in existing technologies being substituted by more effective ones which they assumed would resolve other causes of inequality which are yet to be tackled.

*“Doesn’t need a prize as there are so many communication corporations working in this area”*

#### The access to communication technology theme



To convey the latest thinking of Longitude sub-committee members this theme was presented to stakeholders as “democratising access to communication technology”. Because other themes were felt to be priority, only a limited amount of time was spent discussing this theme, but despite this the

views of stakeholders did converge on two key issues. First, the **thematic title was criticised for being too opaque**, which stakeholders felt was off-putting both in terms of public engagement and prompting a response from the science community. Second, while the idea of stimulating innovative ideas that might help to tackle (inequality of access) caused by disability, skill or language was considered important, stakeholders mostly believed the **communications sector was already making substantive progress** (e.g. Babel fish and Google translate) **so they concluded this theme did not require a prize incentive**.

### Strengthening online identities and cyber security



This challenge was the more salient of the two challenges in this theme. It was evident that its framing enabled participants to grasp it, but the fact that many had heard about cyber-bullying while others noted on-going media coverage about the NSA and GCHQ made it popular.

*“I don’t think this challenge would have been as high if it wasn’t for hearing about the NSA spying on us”.*

Both public and stakeholder reaction to this challenge tended to be similar to views expressed about the other challenge in this theme; they presumed this challenge would be solved by private companies in the communications sector and therefore did not warrant a science prize. Additional findings are summarised below.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Public liked the idea of a prize as a way to raise awareness about cyber security	Public and stakeholders felt cyber security would be solved by the “direction of travel”

### Helping people to access digital communications



The key finding is that while stakeholders had more knowledge of how different technological applications might benefit different groups in society than did the public, both the public and stakeholders felt this challenge was not ambitious enough to be shortlisted for subsequent phases of the Longitude prize. Additional findings are summarised overleaf:

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
So people can access public services which the public assumed are increasingly administered online	Direction of travel already, therefore prize wasn’t warranted
Connectivity valued if it can bring different people together, and help tackle isolation in certain groups of people e.g. elderly	Concern that a solution that ends in more people online could lead to intermittent access for existing users unless infrastructure upgraded
	Without explanation of why this challenge is important the public don’t recognise its importance i.e. what benefits the tech can bring



### 3.7 Technology and robotics for enhanced living

The two challenges presented to the public under this theme were:

- Improving our skills, health and safety
- Improving society's decision-making

#### The technology and robotics for enhanced living theme



Some participants suggested that this **theme was worthy of a prize challenge simply to encourage a debate on the use of technology and robotics in the health, social care and education sectors.**

However, a few felt that technology in everyday life had gone too far and did not support this theme on principle.

#### Improving our skills, health and safety



Without an explanation of potential benefits the public's spontaneous reaction was mostly, but not always, negative and consequently **there was little appetite for this prize challenge to be taken forward to public debate.** Additional findings are summarised below.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Technology may relieve some of the pressure on the health service	Some don't understand the term "autonomous" and would prefer "driverless". When explained most objected on safety grounds
Valued provided the technology will benefit vulnerable people and the less well off	Unless explained people did not understand the benefits of robotic surgery e.g. neater incisions

#### Improving society's decision-making



Improving decision-making did not interest participants, even when informed about potential benefits of different impact (e.g. increase in workplace productivity). Participants did become engaged however when the discussion moved into the area of **restoring cognitive ability in elderly people.** Additional findings are summarised below.

Reasons why the challenge was considered to be important	Reasons why it was considered to be less important
Increased connectivity to help tackle isolation among elderly people was valued provided tech is easier to use	Concern that a reliance upon technology means reduced human interaction although others suggested Skype makes this less of an issue
Appetite for technology solutions provided it can improve quality of life	Off-putting for some because they were concerned about ethical or moral dilemmas
	Concern about creating "super-humans" and implications for those left behind



## The technology and robotics for enhanced living theme and challenges



Stakeholders criticised the framing of this theme. They began by saying “robotics and technology” should be scrapped as it is describing a solution type rather than a challenge. To convey the latest thinking of Longitude subcommittee members, three different challenges under this theme were presented to stakeholders.

- Improving human memory
- Developing self-sustaining devices
- Enhancing medical precision in diagnosis

When asked, stakeholders simply reiterated their concerns about having a technology and robotics theme. These technologies appealed to stakeholders as they thought they had the potential to make a real difference to people’s lives however they felt they **belonged in the relevant theme depending on its potential application** e.g. medical precision in diagnosis should sit in health, self-sustaining devices should sit under energy. As such, these solutions were not discussed in detail.

### 3.8 Summary of public and stakeholder views

There was a **potential tension** between the public and stakeholder view pertaining to the suggested prize challenges. Public appear to favour global issues being tackled whereas stakeholders prioritised challenges which were seen to have direct impact on individual’s lives e.g. health and wellbeing. However, framing is one of the key factors driving this divergence. Public and stakeholder views did converge around certain issues (e.g. tackling dementia / Alzheimer’s) but only when they were invited to suggest alternative prize challenges which they felt could be taken forward to subsequent stages of Longitude 2014. Below is a summary of public and stakeholder views of the suggested challenges, and their suggested alternatives.

Figure 3: Summary of views about potential prize challenges and suggested alternatives

	The public view	Stakeholder view
<b>Challenges with most support</b>	Tackling food shortage Tackling malnutrition Tackling pollution and contamination Improving ecosystems Providing a reliable energy supply to all Helping people to live independent lives	Tackling antibiotic resistance Curing or reversing the effects of dementia Increasing provision of resilient energy Reducing energy usage in passenger transport
<b>Suggested alternatives</b>	Tackling Alzheimer’s Mental health / blindness / “killer diseases” Combatting obesity Water shortage and quality	Energy storage Reduce dependence on oil in transport Resource and waste re-use Declining fish stocks Tackling marine eco-system degradation Water acidification / desalination

## Implications for Longitude 2014

Analysis of the views of the public and stakeholders of potential themes and challenges has revealed that further development of prize challenges may be required prior to the process of prize shortlisting. The key points to consider are summarised below.

- **The committee should not feel constrained by the themes (i.e. challenge categories)** – although they were felt to be in broadly the right areas.
- Where technological solutions were included in the challenge description, **views of the technology rather than the challenge itself drove people's responses**. This is important to bear in mind when thinking about how challenges should be framed.
- **Suggested alternatives** should not be underestimated as they have the potential to engage further and increase the salience of less popular themes e.g. energy.

# Views of Longitude 2014 prize selection criteria

## 4. Views of Longitude 2014 prize selection criteria

This section discusses prize selection criteria from both the public and stakeholder perspective. It also discusses other reported factors that may need to be considered by the Longitude Committee during the process of shortlisting prize challenges. As outlined in the introduction, the public were asked to develop their criteria after having considered the different challenges to help them frame their thinking, whereas the stakeholders were asked to develop their criteria first.

Figure 4: Overview of prize selection criteria by each audience

Prize selection criteria by each audience	
The public's view	Stakeholder view
<b>Ambitious but solvable.</b> Longitude 2014 should reflect the scale and significance of the original Longitude prize.	<b>Specific, outcome focussed</b> prize challenges. This will help with the development of prize success metrics and stimulate innovator engagement.
<b>Interconnected.</b> Tackling or solving one challenge to help resolve other problems.	<b>Impact that makes a real difference</b> in society.
<b>Global reach.</b> Specifically, promoting global equality between developed and developing countries.	<b>Scaleable.</b> Final prize challenge shortlisting should consider issues such as practicality, and affordability to the end user.
<b>Benefit the whole of society.</b> Unless the prize has the potential to make a “life-changing” impact for specific groups.	The prize should stimulate <b>innovation that would not happen without the incentive of Longitude 2014.</b>

### 4.1 Criteria that the public saw as important

This section presents the views of the public in regard to prize selection criteria. It presents the key issues in order of salience and strength of feeling.

#### Ambitious but solvable

The public thought that challenges solved by Longitude 2014 prize should **reflect the impact of the original Longitude prize**. By this they meant that the prize should “make a huge difference” and “have a big impact on society”. This view was often, but not always, based on the fact it has been 300 years since Longitude, the amount of prize money available and also low awareness of the use of prizes to stimulate innovation.

*“This prize is massive; whatever comes out of it, it should be big.”*

Similarly, the public said that **prize challenges ought to be “ambitious”**, and when applied to the list of suggested challenges they felt that some fell short e.g. improving home energy efficiency. Suggested alternative societal challenges which the public said met this criteria included nuclear fission or a cure for AIDS or cancer or tackling global food shortages.

*“How about nuclear power that’s going to be there for thousands of years. Such small things people think when it comes to the environment, home energy use is pragmatic but insignificant.”*

When it was explained that some of those issues had still not been resolved despite decades of research and investment and that Longitude 2014 timescale was approximately a decade there was an **acceptance that final prize challenges would have to be solvable**. Nevertheless, the public still wanted challenges to retain a “wow” factor otherwise Longitude might not capture the interest of science community.

*“I think that it’s only a decade-some things can’t be solved in that time, I think a lot of what we were talking about comes under plausibility.”*

### Interconnected

Unprompted the public often made links between themes and challenges if they presumed that the **impact of solving one would help to solve, or at least, mitigate another**. It was the strength of feeling about this criteria which resulted in challenges associated with global development and food, and the environment being seen as priority, and in tackling those sorts of challenges they believed that the impact of the prize<sup>25</sup> would be maximised.

*“I agree if you can feed more people more efficiently you tackle climate change, help malnutrition and perhaps you can minimise the risk of disasters.”*

The idea of interconnectedness was also seen to be important where people felt **technological solutions could help to tackle socio-economic problems**. Again people tended to point to food shortages or malnutrition and the benefits that might arise as a consequence of them being tackled. They reasoned that if people had enough to eat it would follow that those individuals would be more likely to participate in education and acquire new skills thereby lifting themselves and their nations out of poverty.

*“If you can start feeding people, you will have less crime, less racism, less poverty. If you can find something to change it that’s what the prize is for.”*

A few were concerned that prize selection criteria based on interconnectedness might result in solutions which have unintended, negative consequences, and therefore felt that **selection of final prize challenges required careful consideration of positive as well as negative impacts**.

*“I think interconnectedness is really important because if you fix one area it could have a negative effect on something else, or it could be positive.”*

### Global reach and promoting global equality

As discussed above many felt Longitude 2014 should replicate the original Longitude project in regard to its global impact.

*“I think the whole of society should benefit. Like with the first prize, navigation, that helped the whole world.”*

<sup>25</sup> These participants thought tackling various forms of pollution would help to reduce the rate of eco-system destruction, and reducing the use of fertiliser as a result of increasing usage of cereal crops that can generate their own nitrogen would help to tackle global food shortages while using fewer pollutants.

However, it was evident from societal challenges which the public provided to illustrate their concerns that the public mostly wanted Longitude 2014 to **promote equality between developed and developing countries**. For example, they supported the idea of reliable energy supply for all because it was seen as a prerequisite for boosting economic development. Ultimately the public felt it was important that Longitude 2014 should be a mechanism to get developed and developing countries to a minimum before trying to solve other challenges, especially ones considered to be largely a first world phenomenon e.g. access to digital communications.

By contrast, some **doubted it was even feasible to find a solution that would achieve global reach** even though the idea of global impact in principle appealed.

*“I think there should be something that helps the whole world, not a specific group of people. But then you can’t do that because there’s such vast difference in the development of countries. It’s never going to be a situation where you can help the whole world anyway, so I’m not sure how to think about it.”*

### Who in society should benefit

As discussed above, global reach tended to be refined to promoting global equality during discussions. Having said that, others wanted the prize to **benefit certain groups in society provided the prize had a major “life changing” impact** e.g. improving the wellbeing and quality of life of people who suffer from dementia. However, **support was often, but not always, dependent on whether the condition was perceived to be avoidable** as a result there was less support for helping those with drug and alcohol addiction although tackling obesity was considered important as it was assumed this issue would only get worse.

Many who did not see a problem in a science prize that focussed on certain groups in society acknowledged that there may be others in society who would prefer the prize benefits everyone. They suggested, therefore, that to avoid any controversy about who benefits that at least one of the prize challenges should be devoted to helping specific groups of people.

*“There are some groups who do deserve to have particular attention. There are various groups one should pick. I don’t think it’s wrong to do that as a matter of principle.”*

### Scaleable

The public want assurances that the solution will actually be rolled out. Indeed they thought that it would be no good winning with a prototype unless there is a clear plan in place for how it will become a reality.

*“If you could create a really good electric car that will be massive.”*

Some thought funding the roll-out of the solution was the purpose of Longitude 2014 prize money. Others thought that the prize should be a prize but that there should be a way that a good idea could leverage funding to aid roll-out. Equally, the **public wanted assurances that the solution will be affordable to the end user**. For instance, there was a concern that some of the potential technological solutions presented during the workshops intended to enhance people’s lives (e.g.

exoskeleton or implant technology) would be so expensive they would not be obtainable to the less well off.

## 4.2 Criteria that stakeholders saw as important

Stakeholders were asked to comment on prize selection criteria suggested by the public and to suggest alternatives which they considered important.

During discussion many stakeholders reflected upon the original Longitude prize and felt that, in so far as possible, the development of Longitude 2014 should take into account certain aspects of the original one.

### Specific, outcome focussed prize challenges

Stakeholders began by saying that the original Longitude prize encouraged a variety of responses from different fields because it benefited from being specific and outcome focussed challenge. They felt this approach should be replicated in Longitude 2014 for the following reasons:

- **Metric development:** a well-defined problem would be required so that a metric could be assigned to each selected prize challenge. These metrics could then be used to ascertain prize success or progress towards success.
- **Engaging the innovators:** A specific, well defined challenge with an easily recognisable and understandable outcome would encourage the greatest number of responses from the science community and other innovators.

*“Outcome based- what outcome do you want to achieve with that challenge?”*

Linked with this, stakeholders felt that the suggested **themes had served their purpose to develop possible prize challenges for debate**. They reasoned that once the challenges were finally developed they could stand alone and did not need to be in the context of the original themes.

*“Themes are too broad therefore need to come down a level.”*

### Impact that makes a real difference

Stakeholders said Longitude 2014 prize should be a **“game changer”** and **“make a real difference”**, but it was vital for **impact to be seen through the lens of “public good”**. There was no consensus in terms of who should benefit from Longitude 2014. Some favoured a whole society impact while others supported solutions which by the nature of the challenge would only benefit certain groups in society e.g. those impacted directly or indirectly by dementia.

### Scaleable

Although stakeholders recognised the difficulty of predicting whether or not future solutions will be scaleable, they felt the Longitude Committee ought to consider the extent to which potential solutions can be rolled out before selecting final prize challenges. Issues to be discussed by the

Longitude Committee included: **practicality; affordability to the end user; and the extent to which society can be encouraged to adopt a solution.**

*“Is there not a practicality- the prize is one slab of money, so if not much is happening then the money will just dwindle into nothing.”*

### 4.3 Criteria that had no public consensus

While the criteria discussed below were considered important by some, opinions tended to diverge when the public began to trade off perceived benefits and drawbacks of using them for prize selection.

#### Proven impact

The idea of proven impact tended to be raised when the public discussed the importance of a solution being scaleable. They felt that compelling evidence of demand for emergent technologies might be needed, to ensure the solution would be effective particularly where roll-out was dependent on a change of behaviour. This link between technology and people was illustrated in the example given by one participant. They felt that it would be possible to invent a more efficient, less polluting car but **without evidence of proven public or consumer appetite they questioned whether a solution would be adopted by society and therefore may only look good on paper.**

*“If it is a theory doesn’t a theory need to be investigated first? It would require evidence that it solves a problem.”*

#### Advances existing work

Many supported the idea of the prize challenges that advance existing work (e.g. early stage technology) as they felt this would **increase the potential of the solution becoming a reality**. Others felt it would be advantageous to use the prize as a mechanism to either bring together previously siloed researchers or encourage fertilisation of ideas across different fields in order to **harness and build on what is already happening**.

*“You can be working on a project, some other people working on a project. More minds working together.”*

To increase the magnitude of the prize, there was some support for the inclusion of challenges that receive funding from other sources e.g. government / private sector / charities. However, some thought this would give those **organisations in receipt of funding an unfair advantage which they felt did not fit the spirit of the original Longitude prize.**

Similarly, most **participants did not want large companies to make profit as a result of prize success** e.g. health and pharma / energy and energy companies / digital communications and telecommunications companies. Others were not bothered provided the solutions met their prize selection criteria.



## Innovation

Despite the support for the inclusion of criteria like “**proven impact**” and “**advances existing work**” others were concerned these criteria **might actually stifle innovation**. These participants were keen for Longitude 2014 to reflect the ethos of the original prize and criticised apparently restrictive criteria as they assumed it would discourage the emergence of new ways of thinking or the development of applications for use in areas which had not been previously recognised.

*“Innovation, like the original Longitude prize. Encourages people to think things through to a new solution.”*

### 4.4 Criteria that stakeholders saw as less important

It is important to note that none of the criteria outlined below were rejected just that others discussed above were seen as priority.

- **Advances existing work:** while stakeholders acknowledged the potential desirability of a prize that advances existing work, they were concerned that including this criterion in decisions about prize selection would reduce the potential for innovation. Indeed, for similar reasons they said that it was important not to assign too many criteria to prize selection.

*“I’d drop advances and proven impact. It’s good to have them but not necessarily. It squashes total innovation.”*

- **Proven impact:** seen as a nice to have but ultimately stakeholders did not think it was realistic due to the difficulties in providing compelling evidence that early stage developments deliver their intended impact.

*“Something that has proven itself would be difficult.”*

- **Engaging the public:** provided other criteria are met “engaging the public” was seen as less important. Stakeholders felt that it was the role of the Longitude Committee and Nesta to ensure Longitude 2014 captures the public imagination. They also felt that less captivating issues could be made interesting so long as they are presented in the right way.

*“If the public is not necessarily interested; doesn’t mean we can’t go for it. This is something that the public has to be interested in – we can make it engaging. We shouldn’t be scared for issues that don’t seem engaging for the public.”*

Longitude 2014 prize engagement

## 5. Longitude 2014 prize engagement

This section presents ideas put forward by the public and stakeholders to prompt public and innovator engagement in Longitude 2014 and ideas for sustaining public interest during the lifetime of the Longitude prize.

### 5.1 Prompting engagement

#### Capturing the public interest in Longitude 2014

Views of the public and stakeholders captured during the research suggest the following ideas would be effective triggers for driving engagement:

- **Stimulating interest** – it was felt that information about the details of the original and Longitude 2014 prizes would be attention grabbing and stimulate interest, specifically:
  - **Ethos of the original Longitude prize** – bring to life the “romantic” idea that the original prize winner was a self-educated clockmaker and that Longitude 2014 aims to stimulate responses from a broad range of innovators.
  - **Gravitas of the Longitude prize** – communicate the fact it’s a prize competition and inform the public about the amount of prize money – promote the idea there is a lot ‘up for grabs’.

*“What’s the point in doing the prize if the public aren’t going to know about it or be interested in it?”*

- **Making it personal** – it was suggested that if the public can be made to feel they have a stake in Longitude 2014, and be convinced it is relevant and important to their lives this might prompt engagement. The public and stakeholders believed this would be dependent on the **tone and framing of the Longitude 2014 messages**:
  - **Democratic** – communicate the idea that individually we are all influencers and it’s important to have a say.
  - **Egalitarian** – inform the public that Longitude 2104 will impact on the future of society but the decision of what the prize will fund is not by made by elites.
  - **Emotive** – messages that trigger an emotional response e.g. “it’s your children’s future” were seen as attention grabbing.
  - **State of humanity** – e.g. grand statements which communicate the idea that Longitude is about improving things for the human race as a whole were felt to resonate.
  - **Positive** – presenting challenges as opportunities could help with public engagement as well as increase the potential for taking forward contentious issues to public debate.

Both the public and stakeholders suggested that Nesta and the Longitude Committee should be aware of two perception challenges which might discourage public engagement, if not addressed, namely:

- The perception that **science is dull, boring and esoteric**, and
- The view that some societal **challenges** are “depressing”, “not relevant”, or “controversial” and therefore seen as **off-putting**.

*“If you’re flicking between tv channels then you might watch something else because this stuff is quite depressing. Some people want something softer.”*

However, they felt that if their recommendations for stimulating interest and making it personal were followed this should not be a significant risk.

### **Views on how to deliver the public debate**

The public and stakeholders were informed that in the summer of 2014 there will be a public debate and vote to decide which of the shortlisted prize challenges will become final prize challenge. It was also explained that Nesta thinks that a television programme would be an effective way to engage the public in this debate and vote, and with science more generally. The public’s ideas about the format and structure of the television programme and public debate and vote are presented below.

Overall participants supported the idea of a Longitude 2014 television programme being commissioned. They felt Longitude itself was important and using television was the right approach to ensure the public vote on the final prize challenges.

### **Structure of television programme**

Views about the structure of the television programme were based primarily on information provided to participants about the work of the Longitude committee to date – specifically the fact there are likely to be six to eight shortlisted prize challenges taken forward to the public debate.

Many participants felt there should be a **Longitude 2104 “launch” programme**. It was suggested this launch programme would “get people talking” about Longitude and ensure the vote is understood.

*“There needs to be an initial programme to explain what happened 300 years ago, what’s going to happen in the series, and how the programmes will fit together.”*

The public felt the content should be focussed on stimulating interest using the approaches and framing (i.e. stimulating interest and making it personal) of messages discussed above. The public said the launch programme should be followed by weekly (any longer increases the potential of losing audience) **programmes structured around each of the shortlisted challenges**.

There was no consensus on the ideal length – some suggested an hour per programme while others preferred a shorter ‘Party political broadcast’ style approach.

To ensure maximum exposure the public felt each programme should be allocated a “family-friendly slot” (ideally 7pm on BBC1) and repeated later the same evening and during that week in order to reach the widest audience.

Given the number of potential challenges, many felt that there would need to be a **final programme** that summarises the key points about each challenge. They said this would be a good way bring up to speed people who had missed any of the previous episodes and **not make participation in the vote dependent on watching the whole series**. A few described a final programme like a “**Question Time debate**”, and felt this would be engaging in itself but also to ensure people were informed about the arguments underpinning why different challenges should become final prize challenges. They reasoned that if people felt informed it would increase the likelihood of them taking part in the vote.

## Presentation of the Longitude programme

When asked, almost all participants said Brian Cox and/or Dara O'Briain should present a Longitude 2014 programme. Irrespective of whether or not this can happen, the public agreed that the programme should have **credible and engaging presentation**.

*"The format of the show and the presenters are very important."*

Participants suggested the presenters ought to be **supported by effective science communicators** who can explain in a simple and engaging way some of the potential technological solutions which might arise as a result of the prize. It is vital those individuals are carefully selected so they aren't seen as "anoraks" or "dry scientists". People liked the idea of an advocate for each of the shortlisted challenges who would be able to champion each prize challenge in an engaging and passionate way.

## Format and content of the Longitude programme

The public felt their engagement in part would be dependent on the format and content of the programme. Their views are summarised below.

- **Inform people about the original Longitude prize then make links with Longitude 2014:**
  - Explaining the **nature of the original Longitude problem**, and how some of the most eminent scientists of that era felt it could not be solved, would be a good way to explain the ethos of Longitude 2014.
  - Explaining that the **solution was unexpected** (i.e. clock) would be a good way to explain the need for novel ideas and new ways of thinking.
  - Explaining that the **original Longitude prize had lasting impact** which Nesta hopes will happen in Longitude 2014 would help people see the potential for the prize.

*"I'd want a television documentary about what happened 300 years ago. How it benefitted then and carried out. How it wasn't something great for ten minutes."*

- For each challenge people felt the following would help to establish interest:
  - Explain how each problem **impacts upon society**. Present case studies of people who are affected to **"bring the problem to life"**.
  - **Challenges should be made accessible**. By this they meant that they should be positioned to feel relevant, and be understandable to the general public.
  - **Present solutions which are perceived as "cool" or have a "wow" factor** as these are likely to engage.

*"I think it's about science and technology breakthroughs that have happened or are about to happen - that would really engage me."*

- Present a variety of potential solutions for each challenge so the public **know what might happen if they vote for that challenge**.

The public felt that "in this day and age" Longitude 2014 would need to be **communicated to reflect the different ways in which society consumes media**. Their suggestions are summarised below.

- **Traditional media channels:** television including "on-demand", radio and printed press
- **Shortened version of each programme to suit a variety of circumstances, namely:**
  - people who use technology "on the move" e.g. tablet / smartphone
  - the "internet generation" who the public felt tended to be easily distracted

- individuals who, for a variety of reasons, may feel an hour long programme about science is off-putting

*“Some science programmes are about things that are very interesting but are done in a boring way, it would be better if it [edited version of Longitude programme] was 10 minutes.”*

- **Social media** including Facebook and Twitter. The public suggested Nesta should recruit credible individuals who have a large number of Twitter followers in order to convince them to “tweet” about Longitude during the public debate and vote.

### Public vote

Unless the **public vote is free of charge** it was assumed people would be discouraged from taking part. Others suggested this would be needed even if the format, content, and presentation were particularly engaging because ultimately people were being asked to vote on a science prize.

*“It’s important that if there is voting that it’s free; not like X factor.”*

**Ensuring it is easy for people to vote** was also seen as important. Participants felt it should be possible to vote via a telephone, a television remote control, online, and a few suggested there could be a Longitude “app”. Some suggested that a prize draw would incentivise participation.

### Potential for increasing interest in science and technology more generally

If Longitude 2014 is to function as a mechanism for driving interest in science and technology more generally, the Longitude 2014 television programme will need to **focus on technological developments which are seen as relevant to people’s lives or tackle big global, interlinked issues**.

*“Show science is cool, and science can do things. I think that’s important too.”*

During the public workshops, many people spoke about themselves as parents and felt that the Longitude 2014 **television programme would need to do more than just present and debate different societal challenges to stimulate the interest of young people and children**. These parents suggested that each episode could include demonstrations of scientific experiments which link to that week’s topic. They suggested that at least one of these experiments should be easy enough for young people or children to replicate at home (under supervision). Importantly, no special equipment should be necessary for this. Results should be achievable within a week so that families would be incentivised to watch the next programme to find out how their results compared with others. The public also said that a Longitude 2014 pack designed to be used in school would be a good way of reaching out to young people.

*“You would think that it would be pushed in schools because a lot of kids don’t get involved in science. So it [television series] would be good way to get them interested.”*

### Engaging the science community in Longitude 2014

In terms of engagement, discussions in the public dialogue workshops were focussed on the things which might encourage the public to take part in the public debate and vote. Therefore ideas about engaging the science community and other innovators in Longitude 2014 tended to be expressed by stakeholders. Their views are summarised below.

- **Framing was seen as vital to encourage engagement:**
  - Each problem and the desired outcome should be **specific but open to a range of solutions** to maximise response.
  - Challenges should be framed in a **positive way** (i.e. 'promote equality' not 'address inequality') as this was seen to be more likely to work as a "call to action".
  - **Abandon the top-level thematic areas** (e.g. energy) as they were seen as too broad and opaque which could be seen as off-putting.
  - Use the prize to **(Re)establish the UK as a global leader** – they felt the prize winner would help to re-establish the UK as a global leader in science and technology and they thought this would be an effective way to communicate one of the benefits of Longitude 2014.
- **Publicising Longitude 2014 to ensure maximum interest:**
  - Explain how **prize money** will work across the different prize challenges so innovators know what to aim for.
  - Promote the **"hero status"** of Longitude winner so that it appeals to a wide audience.
  - Use a **variety of channels** to ensure the message reaches as wide audiences as is possible i.e. researchers, academics, and students and other innovators.

## 5.2 Sustaining engagement:

### Updating the public about prize progress

If public interest is to be sustained in Longitude 2014, then the public felt it should not take too long before they see evidence of progress. Despite public acceptance that it may be difficult to provide even interim progress given the scale of some of the problems, most felt they would need an update every 1-2 years to sustain interest.

*"Maintaining engagement with the public; if you launch the challenge now and 3 years on, nothing's happening, people will forget. People have short attention span."*

Keeping the public updated on progress over the duration of Longitude 2014 would seem to support the idea of having **one main Longitude prize then other smaller ones or having one prize but with progress milestones which can be reported back to the public**. Stakeholders also felt having one prize with milestones would be a good idea, and suggested a television series could follow different 'teams' in their progress towards the prize milestones. They felt adding this element of competition would make the prize more interesting and engaging. However, they noted it would only be possible if the teams took very different approaches to addressing the challenge so they would not be worried about 'giving away' ideas to the competition.

It was evident in the way in which people want to be kept informed about Longitude progress that they imagined a programme like the BBC's *Child of our Time* which shows specially commissioned programmes shown every 2 or 3 years, and is scheduled to end in 2020.

Again, the public said that the content and format of any television update would need to be attention grabbing to sustain interest. Subsequently, many welcomed the idea of a Citizen Committee to ensure updates about prize progress were framed in a public friendly and engaging way.

# Recommendations



## 6. Recommendations

This public dialogue and stakeholder event revealed there appears to be genuine support and interest among the public and stakeholders for Longitude 2014. The research indicates that further work can be done to develop **a series of challenges which are specific, outcome focussed** and that will enable **the development of prize success metrics and stimulate innovator engagement**.

### Next steps in the development of Longitude 2014

The process taken by Nesta's Centre for Challenge Prizes, including input from the Longitude Committee and other experts, the public dialogue and stakeholder event has helped Nesta understand the public and stakeholder responses to the prize challenges, prize selection criteria, and what engagement should look like. This work has been useful but more needs to happen to maximise innovator and public interest.

We suggest that Nesta harnesses and builds on these activities, by taking the following steps:

- The first stage in this process is to ensure the findings from this report are reflected in Nesta's latest thinking about prize challenges. We suggest that the **amended list of potential prize challenges be compared against the prize selection criteria outlined in this report** before subsequent testing.
- Following this, Nesta could reconvene the experts who attended the previous stakeholder event in order to deliberate on Nesta's amended list of potential prize challenges, as identified through this research and the work of the Longitude Committee. This stage would serve two key purposes. First, stakeholders would act as a **sounding board and sense-check potential prize challenges**. Second, it would also allow stakeholders to **re-visit any themes, which did not prove to be popular but were nevertheless felt to be important e.g. the energy theme**, provided they reflected their prize selection criteria. The output will be a revised set of potential prize challenges which could be tested with the public.
- The views of the public revealed that two key issues need to be considered in terms of **Longitude 2014 dissemination: making it personal and stimulating interest**. Theoretically any challenge may work with the public provided it is framed in the right way. Therefore, we recommend that Nesta convenes a small group of people who are broadly representative of the public so that they can influence the final framing decisions taken by the Longitude Committee. We suggest that this **"Longitude Citizen Committee"** could convene every couple of months during the on-going development phase to ensure potential prize challenges are presented in a public-friendly way. This stage would have the added bonus of further enhancing the transparency of the shortlisting process.
- If followed, this **process is likely to provide Nesta with a series of potential prize challenges which will be defensible and fit for purpose**. We believe this should help the Longitude Committee decide on which challenges should be taken forward to public debate, and ultimately maximise innovator and public interest.

Naturally, this report is only one input into the Committee's decision-making processes. We recommend that where proposals outlined in this report are not taken forward, the Committee has a clear reason why which can be communicated to those who participated.