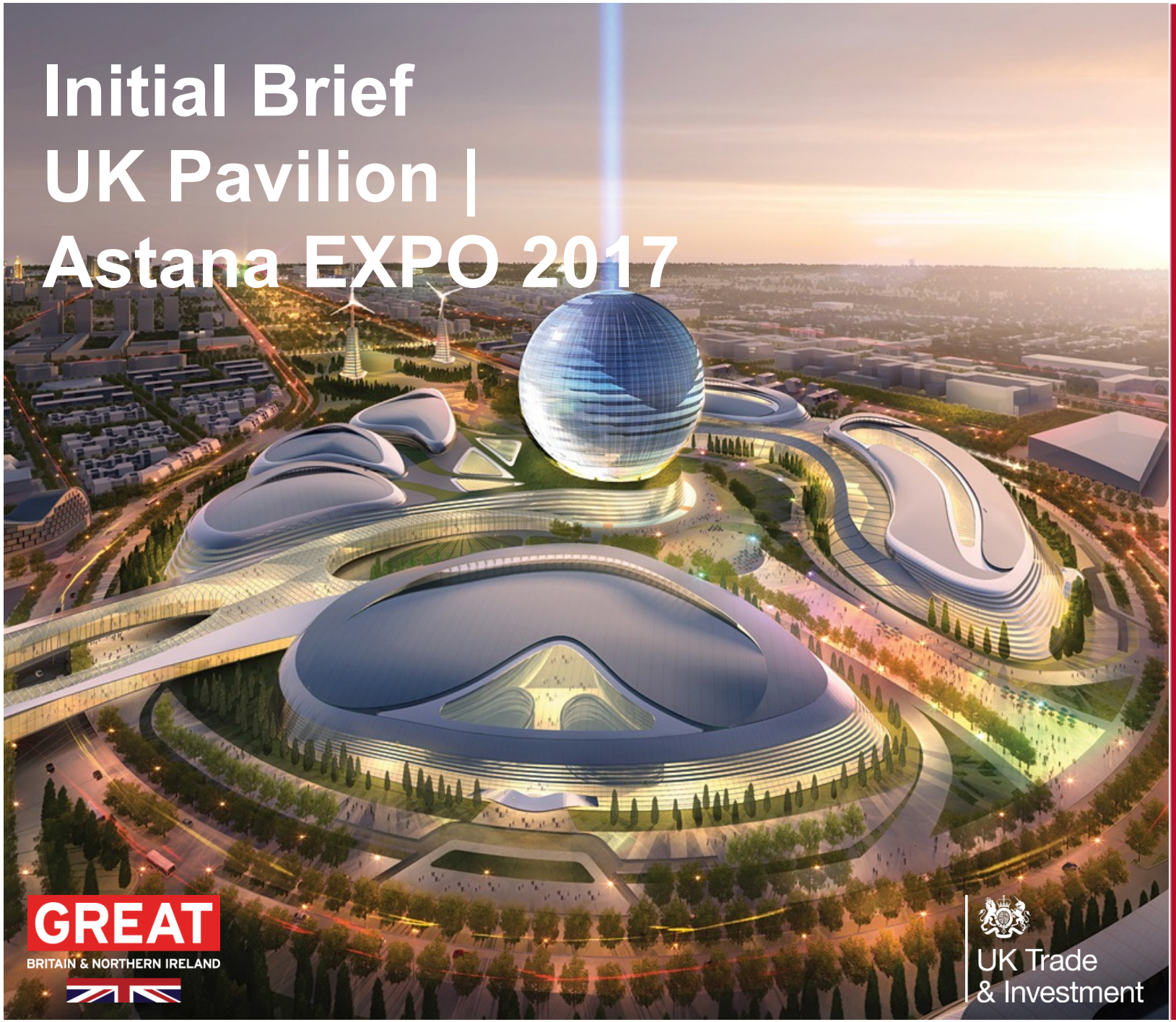
Initial Brief
UK Pavilion | Astana EXPO 2017



GREAT
BRITAIN & NORTHERN IRELAND

UK Trade
& Investment

Contents

1. Vision for the UK Pavilion

We are launching a competition to find a highly innovative, creative and unconventional design for the UK Pavilion at the Expo in Astana, Kazakhstan in 2017, which will highlight the challenges facing the world in the supply of future energy.

Following on from the success of the UK's Pavilions at the Shanghai Expo in 2010 and the Milan Expo in 2015, both of which won multiple awards, including the Expo gold award for architecture and landscape, we are looking for a design which demonstrates UK leadership in finding solutions to future energy production and consumption challenges in a rapidly growing world.

The Astana Expo will run from June to September 2017 and participating countries will be offered pre-built pavilions. We want to create a powerful story within our Pavilion and a memorable experience for the expected two million visitors to the Expo and for the many millions more we will reach through digital channels around the globe.

We invite you to design a Pavilion and experience, which promotes UK creativity, innovation and expertise across the energy sector, underlines our openness to global collaboration and partnership and demonstrates our commitment to supporting global efforts to secure sustainable energy development for future generations.

We hope that you will enjoy the challenge and look forward to receiving your designs.

The Rt Hon. Charles Hendry
UK Commissioner
Astana Expo 2017

2. Aspiration

Our principal aim at Astana Expo 2017 is to promote the UK as a business partner of choice, as a world leader in higher education and academic study and as a country with a rich and diverse heritage and culture, open to the world and welcoming visitors from all around the world.

Through the UK Pavilion and associated business and cultural events programme we want to:

- Highlight the UK's unique selling points as the most open, flexible and diverse European economy and society; creative and innovative; a global leader solving shared challenges and promoting sustainable development.
- Promote UK global leadership in science and research, smart technologies and green innovation and expertise to developed and emerging markets.

3. Key Messages

The UK's target audiences are:

- Kazakh, regional and global leaders and opinion formers, in particular business leaders engaged with the key sectors and themes of the Expo.
- Those considering visiting or studying in the UK.
- Kazakh and international visitors to the Expo.

The narrative proposition is:

The UK takes the lead in overcoming global energy challenges.

The UK's innovation and creativity are helping to develop 'Future Energy' technologies.

The UK is welcoming, diverse and open for business.

4. Key Requirements

- Exemplary, original and outstanding design
- Innovative and unique in content and visitor experience
- Easily comprehensible to an international, multicultural audience during a projected 10-15 minute visit time
- A single, coherent message which runs through the experience, content and digital offer of the Pavilion
- Appealing to young people – both children and young adults - who are expected to make up a significant percentage of the visitors
- Capable of coping with projected visitor numbers without creating queues
- Low cost to staff and maintain over the course of the Expo
- Can be built within the short timescales set out in the timelines provided

5. Operational Requirements

The following Operational Requirements must be incorporated within the design:

OR	Staff Requirements	Sponsor/Partner Requirements	Catering
OR-1	- An office with desk and seating space for up to 10 people, power points, filing cabinets, shelving, white boards, wired with Hard line and Wi-Fi access (Depends on Expo Technology package). - A meeting Room with space for 20 people, power points, TV screen and laptop for presentations, white boards. Wi-Fi and hard line. - Male & Female Changing Room with storage for staff bags change of clothes etc. (this could be a shared space for use by catering/kitchen staff as well.	- Sponsors Lounge with seating for up to 20 people, screen with laptop, hard line touchdown computer and Wi-Fi. This should be furnished in the style of a VIP lounge. - Flexible conference space with stage/riser platform, screen, lectern, speakers, mixing desk and microphones, hard line and Wi-Fi access and seating for 60 theatre style. The designer should ensure that this space allows for multi-functional use with adjacent storage space for chairs, tables and poseur tables. Ability to brand the space for sponsors is desirable.	- Space allocation should be planned for a kitchen, restaurant and/or bar, caterer's office, hard-line and Wi-Fi, M&F changing rooms with toilets (could be combined with staff facilities), storage. Catering providers and solutions are still being sourced and so floor-plan allocation only needed at present
OR-2	- Relaxation area for staff to take their breaks and have lunch featuring basic kitchen features such as fridge, hot and cold drinking water, microwave, storage cupboards, soft seating for up to 12 people, Wi-Fi.	- 1 x Sponsors Office with desk space for 4 and meeting table and chairs, Hard line and Wi-Fi.	
OR-3	- Assuming that the staff space is mainly located on second floor then a Pavilion floor office with two desks and chairs, Wi-Fi access.	- Small Green Room for speaker preparation.	

1 = essential
2 = highly desirable
3 = desirable

6. Site Information

Astana EXPO 2017 is an international exhibition recognised by the Bureau International des Expositions (BIE).

The core and shell of the pavilion are delivered by the EXPO organisers. Participants' pavilions are exhibition fit-outs constructed within particular pre-built spaces.

The space available is as follows:

- A 1100 m2 double-height hall, which is high enough to include a mezzanine (if required).
- A 1100 m2 floor above for non-public usage (offices etc.)
- Storage on the floor below

Further information is provided elsewhere in this RFP.

7. Astana EXPO 2017

Astana EXPO 2017 is being held in the capital of Kazakhstan from 10 June -10 September 2017.

The theme of the EXPO is 'Future Energy' with three sub-themes:

1. Reducing Carbon Emissions – renewable energy, a future in hydrogen, carbon capture and storage, thermonuclear fusion energy
2. Living Energy Efficiency – efficient use of energy, urban planning and buildings, efficient transportation, efficient industry
3. Energy for All – energy against poverty, access to sustainable energy development, decentralised energy systems

Participants are invited to develop each sub-theme by applying two out of five matrices: scientific research; advanced technologies; management; innovative business models; shift in values (see page 72 of International Participants Guide).

More details about the themes can be found in the International Participants Guide (pages 209-221).

More than five million visits are expected to be made to the EXPO by two million unique visitors. Around 55,000 visitors are expected on an average day with around 110,000 on peak days.

More than half the local visitors to the Expo are expected to come with families. 85% of visitors are expected to come from Kazakhstan with 15% from neighbouring countries and participating states.

A Future Energy Forum will run throughout the Expo offering conferences, discussions and thematic weeks on key energy themes. A cultural and entertainment programme will offer around
3,000 events within the Expo, in the city of Astana and across Kazakhstan.

8. British Innovations in Energy Technology

Batteries

Batteries can be the link between solar panels and energy use. At the moment power generated during the day from panels when no one is at home is currently fed into the grid but it would be more effective to store and use in the same house. In the UK there are currently 650,000 homes with solar panels. UK technology has perfected a 'suitcase' sized battery which stores surplus energy from roof top solar panels to create a 'virtual power station' in the home.

Graphene

Graphene is known for its high electrical conductivity and strength, but is traditionally inefficient at light absorption. Typically, a graphene sheet would only absorb around two to three per cent of the light that hits it. However UK researchers by patterning graphene in a similar way to moths' eyes have found its absorbency can be boosted by 90 per cent, creating the most light-absorbent material for its weight that has ever been created.

Space Technology

The UK is a leader in bespoke space and satellite technology. The UK Government aims to expand the UK space industry; there are already strong links between the UK and Kazakhstan in this area. There are a number of UK companies (SME's) working in this area and much of their technology and innovations can be adapted to use on Earth in the field of energy efficiency.

- 'Satellites run on sunshine' advances in solar cells. UK companies are leaders in 'Cube' satellites and 'boom' technology (smaller payloads mean more efficient delivery).
- Development of precision use of energy, microwave and other communications technology for use in satellites with applications for use on Earth.
- Big data handled by satellites and their application in crisis management and the sharing of data. The UK is sponsoring Kazakhstan joining the international agreement on crisis management (2016)
- UK SMEs involved in the development of technology for a low cost earthquake prediction.
- Development of an advanced UK Imaging Camera
- UK known as world leader in infra-red thermometers.

8. British Innovations in Energy Technology

Bio Fuels

The UK is a world leader in looking for creative ways to create new fuel sources. One example is an award-winning green energy company that has industrialised the process of recycling waste coffee grounds into advanced biofuels.

They work within existing waste management infrastructure to collect waste coffee grounds, which are recycled into advanced biofuels, biomass pellets for heating buildings and, in the near future, biodiesel to power transport systems.

500,000 tonnes of coffee grounds are currently produced in the UK each year, which often end in landfill and create carbon. It is estimated that 20% of grounds can be extracted as oil which can be mixed into bio fuel. 5m tonnes of biomass pellets are consumed by the UK each year. So far the UK only produces 50,000 tonnes domestically.

Carbon Reduction Technology

Photo bio-converter cells that harnesses tailored photosynthetic microorganisms (mostly algae) to convert carbon dioxide into oxygen and high quality biomass only using water and any visible light.

“Solar bio-converter systems” can also convert carbon dioxide and nutrient pollutants (which decrease wastewater treatment operating costs) into dissolved oxygen to cut down energy used in aeration treatments (50% of plant’s energy consumption) and biomass. This can be locally processed into biogas or bio-products to be used for the plant’s energy requirements.

The technology has the potential to disrupt other industries, including interior lighting (air purifying and carbon-neutral luminaries), urban development (carbon sequestration and local biogas production) and even space exploration (life support unit).

8. British Innovations in Energy Technology

Clean Cold Energy

The ‘Cold Economy’ could create 10,000 jobs in the UK by 2025. In the UK alone 16% of electricity consumed is keeping people and food cold. Worldwide cooling within 15 years will require another 139GW (more than another Canada).

India currently has 10,000 refrigerated trucks, 180,000 needed within 5 years. Currently 40% of food grown in developing countries is lost post-harvest during transportation.

UK technology is being tested in the Innovate UK and Office for Low Emission Vehicles (OLEV) co-funded Cool E transport refrigeration project. We expect the zero emissions refrigeration system to be in use in 100 vehicles on the road in 2017 and to be in full manufacture by 2018.

There are a number of other applications for clean cold technologies and the UK is one of the few countries currently looking at this field of energy solutions.

New Bespoke Drilling Technology

Volatility in the price of oil over the last year has sharpened producers’ focus on costs of production as never before. This means that the UK is in a good position to create bespoke and innovative technologies to enhance current oil and gas exploration.

For example a new generation of monitoring technology which sends information back to the surface – or even thousands of miles away to a monitoring station – so adjustments can be made in real time, has been created by a UK SME.

It sits just above the cutters, using acoustic and magnetic sensors to take continual measurements and feeds back the information in a continuous loop to optimise the cutting operation. It has no moving parts and can be retro-fitted to any drilling assembly.

8. British Innovations in Energy Technology

Energy for All

The UK aims to provide policy makers, donors and development agencies concerned with rural energy access with new insights on the real barriers to energy access in villages in developing countries – technological, financial and political – and how they can be overcome.

Some UK funded organisations have chosen to focus on remote off-grid villages, where local solutions (home- or institution-based systems, and mini-grids) are both more realistic and cheaper than national grid extensions. Their concern is to ensure that energy access results in development and the creation of 'smart villages' in which many of the benefits of life in modern societies are available to rural communities.

Some have looked at creating hybrid power generators, off-grid power systems and renewable energy storage solutions.

Mining

The breadth and depth of leading international research by the UK's academia and industry underpins the country's world-class mining expertise and supply chain.

Pure and applied research covers disciplines essential for the future of global mining, such as sustainability, energy, biodiversity and water. The research and development capabilities of UK companies, universities and research institutes span: the physical, natural and social sciences; engineering; safety; IT; management; the law; finance; and many other disciplines. Much of the UK's mining research is interdisciplinary and conducted jointly between industry and academia.

In addition to partnering with leading university research departments, UK companies have dedicated in-house research and development capabilities, and are pioneering new technologies throughout the supply chain. Research programmes focus on areas including: exploration; prospecting support technologies; mining and minerals engineering; mining equipment, with a focus on heavy engineering; IT; and safety technologies.

Innovative environmental science and engineering research is considering the sustainable mine lifecycle, seeking to design out waste streams to minimise environmental impact and optimise return-to-use of mining areas following closure.

9. Accessibility and Inclusive Design

The UK Pavilion's visitor experience must meet all applicable standards and best practice requirements for accessible and inclusive design.

Areas to be considered as part of an inclusive design strategy shall include - inter alia - the following:

- Entrances/exits
- Stairs/ramps
- General seating and rest areas
- Through routes
- Displays
- Interpretative devices and audio-visual displays
- Tactile displays and visual aids
- Graphic information
- Signs and orientation (Wayfinding)
- Lighting and visual contrast

Through End Stage Reports the successful Design Team will be expected to demonstrate how this requirement is applied to the scheme.

10. Sustainability and Legacy Requirements

UKTI is committed to sustainability and legacy considerations being fully incorporated into the scheme.

Wherever practicable discrete elements of the scheme should incorporate modular and re-usable components.

Design proposals should highlight potential innovative approaches to re-use and re-purposing that create a positive legacy.

11. Health & Safety Requirements

The Design Team's responsibilities towards health & safety shall be considered as those applicable to a Designer under the Construction (Design and Management) Regulations 2015.

The design of the pavilion must, in so far as is reasonably practicable ensure health & safety through all phases of the life cycle of the project, from concept design, through development, fabrication, construction, operation, maintenance, removal and re-purposing.

12. Budget Requirements

The Design Team should produce an elemental estimate based on their preliminary design concept.

The Capped Budget is outlined below - to include all design fees and construction costs:

£2,000,000.00 exclusive of VAT.

The Design Team should ensure that their proposed design concept and associated components, do not exceed the Capped Budget outlined above.

UKTI is actively seeking Free Issue Materials and Equipment that can be incorporated into the final pavilion to reduce the out-turn cost of the scheme.

Where Design Teams' have propositions and recommendations; these should be clearly identified in their responses.

Appendix A – EXPO 2017 General Matrix of Sub-Themes and Approaches

ANNEX I. GENERAL MATRIX OF SUB-THEMES AND APPROACHES

FUTURE ENERGY				
Approaches to considering sub-themes		Sub-theme 1	Sub-theme 2	Sub-theme 3
Scientific research:	Scientific knowledge and research aimed at the future of energy. (Elaboration of concepts, new sources, use, trends, energy efficiency, etc.)	**Reducing CO2 emissions**	**Energy Efficiency Lifestyle**	**Energy for All**
Hi-tech:	Advanced technology solutions: products and services (electricity generation, storage, transmission, distribution and consumption; power system; security; energy efficiency, comfort etc.)	Renewable energy	Efficient use of energy	Energy against poverty
Management:	Solutions for public and corporate governance and their outcome: states, regional and local governments; supranational and multilateral agencies; corporations; NGOs and non-profit organisations; and other stakeholders (Management, performance, strategy, policy, management, technology and projects)	A future in hydrogen?	Urban planning and buildings	Access to Sustainable Energy Development
Innovative Business models:	Business plans for new energy markets. New types of business. Technology market, business opportunities, communication, entrepreneurs etc.	Carbon capture and storage (CCS)	Efficient transportation	Decentralised Energy Systems
Value transformation:	Changing the values due to social innovation through social networks and other platforms (e.g. cloud computing), social engagement and change of standard behaviour patterns.	Thermonuclear Fusion Energy	Efficient industry	

UK Trade
& Investment

GREAT

BRITAIN & NORTHERN IRELAND