

**SPECIAL REGULATION NO. 1
ON THE DEFINITION OF THE EXHIBITION
THEME AND THE MEANS OF ITS
IMPLEMENTATION BY THE ORGANISER
AND THE PARTICIPANTS**

Special Regulation Number 1

On the definition of the Exhibition theme and the means of its implementation by the Organiser and the Participants.

Article 1. Objective

The purpose of this Special Regulation is to define the Theme of the International Exhibition Astana 2017 (hereinafter, the '**Exhibition**' or '**Astana EXPO 2017**') as set out in Articles 1 and 34 of the General Regulations of the Exhibition and in accordance with the decisions adopted at General Assemblies 115 and 118 of the Bureau International des Expositions on the importance of defining the theme of International Exhibitions, and to set forth the measures for the development of the theme to be taken by the National Company Astana EXPO-2017(hereinafter referred to as the '**Organiser**') and the Participants.

Article 2. Theme Title and subtitle

The title of the Exhibition Theme is the 'Future Energy' and the subtitle is 'Solutions for Tackling Mankind's Greatest Challenge' (hereinafter referred to as the '**Theme**').

Article 3. General Principles

With the purpose of ensuring the understanding of the Theme by the Participants and coherence between the presentations of the Theme and sub-themes in Participants' respective pavilions and the theme developed by the Organiser, the following principles shall be applied:

i. The Organiser and all Participants shall abide by the rules laid out in the General Regulations and the Special Regulations of the Exhibition.

ii. The Organiser shall assist Participants to ensure their presentations are in line with the EXPO Theme, Future Energy. The Organiser will provide the Participants all information about the Theme that the Organiser considers necessary. The Organiser will also review the Participants' Theme Statement and accompanying documentation. If necessary, the Organiser will discuss with the Participant any issues with the Participants' presentations and work to resolve these issues before approving the Theme Statements.

Additionally, the Organiser shall have dedicated resources set up in order to achieve any necessary coordination.

iii. The objectives pursued by the Exhibition are the following:

- To promote best energy practices towards sustainable development.
- To foster research and technological development of clean energies.

- To exchange knowledge on Future Energy among all stakeholders: Participants; academic institutions and scientific societies; business and industry; and civil society.
- To educate and raise awareness about the opportunities, challenges and demands for the future of energy.
- To contribute to education, learning and knowledge through art, culture and entertainment.
- To create a platform for technology and the transfer of knowledge and expertise towards a green, healthier, sustainable future.

All these objectives form part of a single goal:

To create an overarching global awareness, at an institutional, corporate and general level, about the need to develop responsible and sustainable energy policies and platforms, to ensure the future of our planet.

Therefore, the Participants shall develop their presentations taking into account the above objectives in order to contribute to realising them.

iv. The Participants may explore in their exhibits as many sub-themes as they choose. Article 5 of the present Special Regulation 1 explains the sub-themes into which the Theme Future Energy is divided.

v. The exploration of each sub-theme should be done by the Participants from a minimum of two perspectives to be chosen from the following five and according to the matrix attached as Annex I of this Special Regulation No. 1:

- a. Scientific research
- b. Cutting-edge technologies
- c. Governance
- d. Innovative business models
- e. Value change

Article 4. Definition of the Theme

Energy has played an essential role in the on-going evolution of everything that makes up and is contained in the universe: galaxies, stars, planets, species and human society. Without the intelligent utilisation and consumption of energy, mankind would not have developed. However our use of energy up to the present era has been opportunistic, and in a large part without regard for the consequences. We are at the dawn of a new era, imposed on us both by looming constraints in supply and by the enduring damage wrought by the by-products of our energy usage to date.

The importance of energy in our life is fundamental; our main economic activities - such as manufacturing, transport, industry and communications as well as everyday conveniences - depend on energy.

In addressing the challenge of Future Energy we consider the following to be the most important questions that must be answered: where we get energy from (including potential new energy sources), how we produce energy and how we can use existing energy sources more efficiently. There are also challenges to be overcome, such as the availability and cost of energy resources and technologies, the environmental impact of energy use, energy security and safety and universal access to clean electricity and reliable energy supply.

Hence, the main goal of society in this field must be to develop and nurture an extensive global process to adopt the kinds of clean technologies that will ensure access to an uninterrupted and plentiful energy supply. This will enable us to cope with the challenges emerging from energy security needs and climate change, as well as the growing demand for energy.

In this sense, the theme Future Energy tackles global energy-related challenges and those related problems that have a direct impact on basic aspects of life on the planet (for example global warming and climate change, development, energy security and resource shortage, access to water, protection of biodiversity and the promotion of world equity).

The purpose of the theme in the Exhibition is to provide an international platform for global debate where participating countries, organisations and companies can explain their particular views and propose solutions to address the worldwide energy challenges as well as provide reliable and practical information to visitors who will play a critical role in this debate.

One of the fundamental concepts that will be considered by the Participants is technology. This is because it is directly relevant to the theme of Future Energy and it has a fundamental role in the achievement of the goal of the Exhibition. Energy and technology are inextricably intertwined.

Given the diversity and the disparities in both technological development and in access to energy in various strategically important regions of the world, it is vital to determine which combinations of policy and technology will prove the most effective in specific situations.

In this sense, some of the main tasks in the energy sector of the future must be (i) to define sustainable energy supply models; (ii) to improve energy efficiency; (iii) to increase the share of clean and renewable energy; (iv) to establish and maintain the requisite energy distribution networks to meet demand; and (v) to foster universal access to sustainable energy.

Article 5. Theme development: sub-themes and understanding

'Future Energy' as the main theme of Astana EXPO 2017 has been broken-down into the following three sub-themes: (i) Reducing CO₂ emissions; (ii) Living Energy Efficiency; and (iii) Energy for all.

i. Reducing CO₂ emissions

This sub-theme highlights the importance of reducing CO₂ emissions by developing a portfolio of low-carbon energy technologies. In this context, the promotion of clean and renewable energy sources, carbon capture and storage (CCS) systems and, possibly, hydrogen and fusion energy, will play a decisive role in the future. The Participants may address this sub-theme through one or more of the following concepts:

a. *Renewable energy*: We live on a planet rich in natural energy resources that we can harness without harming the environment. The sun, the wind, water, heat from the Earth and plants are energy sources that can satisfy the demand for energy in a more sustainable way.

Renewable energy sources are considered to be more beneficial for the environment, for our health and for the economy because they are less polluting, contribute to a slowdown of global warming and promote an industrial fabric that creates employment. It is especially important that renewables expand quickly in emerging economies and in developing countries.

Renewable energy is broadly defined as energy harnessed from the following sources:

- Sunlight; Wind; Rain; Tides and waves; Geothermal heat (generated by the earth); Modern biomass.

We are witnessing extraordinary developments in the area of renewable energy thanks to the use of advanced technologies. In addition to technological advancement, government support plays an important role in the further development and dissemination of renewable energy sources.

In particular, the electricity sector presents the greatest potential for increasing renewable energy production and use. There are two areas that are important to consider when it comes to renewable electricity production:

- Energy decentralisation and regional strategies: Renewable electricity production is by its nature decentralised and it does not necessarily have to be part of a centralised distribution system.
- Smart grids: Optimise the electricity distribution systems and allow users to manage electricity usage individually, by allowing them to sell/buy excess energy through a smart grid. These networks will totally transform the way energy is generated, distributed and consumed.

b. *A future in hydrogen?* Hydrogen, an abundant chemical element, could be an important alternative to fossil fuels in the long-term. There are a great number of methods that currently exist for generating hydrogen energy. However, some of the challenges include the cost of production and storage of hydrogen energy, as hydrogen is highly combustible.

c. *Carbon capture and storage (CCS):* Energy demand is expected to increase between 40 and 50% in the coming two decades and fossil fuels (coal, oil and gas) are expected to remain significant sources of energy until the middle of the current century. As a result of the continued use of fossil fuels in the foreseeable medium-term, emission levels could skyrocket, making lowering emissions one of the top priorities.

One of the technological alternatives to reducing emissions is CCS, which involves the separation, capture and storage of CO₂ resulting from the production, processing and combustion of fossil fuels, thus preventing the release of large quantities of CO₂ into the atmosphere.

CCS may play a vital role in the reduction of CO₂ emissions. For that reason, overcoming the current challenges of efficiency and costs associated with present CCS technologies is considered of significant importance.

d. *Fusion energy:* Fusion energy is the energy released in a nuclear fusion reaction, such as occurs in the Sun. This is not to be confused with nuclear fission, the technology behind the world's current nuclear industry.

Artificial fusion has for half a century looked like a promising option for generating large amounts of clean, safe and almost unlimited energy. However, on an industrial scale, costs have proved prohibitive. Additionally, there are safety concerns associated with its use. With this background, the development of technologies that allow for safer use of the nuclear fusion process in power plants is considered key.

ii. Living Energy Efficiency

This sub-theme highlights the role of energy efficiency as one of the key ways to combat climate change and meet the energy challenge of the future. The Participants may express the sub-theme 'Living Energy Efficiency' through one or more of the following concepts:

a. *Energy efficiency:* Energy efficiency means improving the way we use energy in every aspect of our daily lives and it is something we all need to be involved in. It is essential to develop strategies through low-cost options to make cities, buildings and transport more efficient in order to reduce greenhouse gas emissions.

b. *Urban planning and buildings:* There is tremendous potential to save energy through improved urban planning as well as by upgrading buildings and establishing more effective efficiency standards for new constructions.

Methods and techniques such as bioclimatic design and energy efficiency control processes reduce power consumption, and make heating, ventilating, air

conditioning and insulation more efficient. These measures, together with low-energy lighting systems, passive solar systems and responsible consumption habits, among others, enable more efficient energy use. The Exhibition will be an outstanding platform to present these methods and techniques.

c. *Efficient transport*: Transport is responsible for almost 55% of the world's oil consumption, according to the International Energy Agency (IEA). In the private transport sector, sustainable and efficient solutions should be encouraged for urban transportation. Such policies include encouraging the use of bicycles, electric vehicles (particularly as technology develops) and hydrogen fuel cell- or bio-fuel-powered vehicles. Additionally, the use of the vehicles in a responsible manner, the increase of vehicle occupancy (such as through car-pooling or car sharing) and technological innovation can enable a more sustainable urban transport system.

d. *Efficient industry*: Industry accounts for one third of all global energy use and for almost 40% of global CO₂ emissions (per the IEA). Industries are energy-intensive focal points that require the deployment of efficient technology and engineering solutions.

Although each industry has different energy requirements, many industrial processes require high temperatures and/or high power in production that produces waste heat. Innovative technologies are currently being developed (e.g. thermochemical and thermo acoustic heat pumps) that use the waste heat in plant operations or feed it back into the grid.

Additionally, there are other solutions for improving energy efficiency in industrial processes, for example, replacement of legacy machinery with more efficient equipment, implementation of automation and process control systems, or the installation of energy-related software applications.

iii. Energy for all

This sub-theme, 'Energy for all', highlights power access as a basic need and right in the developing world. People in the developing world are particularly affected by the lack of access to affordable, clean energy and by environmental deterioration. In order to transform their economies to more sustainable models, wider access to sustainable energy is needed. The Participants may tackle the sub-theme 'Energy for all' through one or more of the following concepts:

a. *Energy against poverty*: Access to energy is a basic right for all people in the world. The lack of energy has a negative impact on many aspects of societal development, for example on health, access to water, agricultural productivity, etc.

The problem of energy poverty is twofold: general lack of access to electricity means a lack of opportunities for societal development, while traditional use of biomass (not to be confused with modern cultivated biomass, a key renewable) for cooking causes health risks and even premature deaths. The greatest

challenge lies in sub-Saharan Africa, where 80% of the population relies on traditional biomass and the electrification rate is only about 30%.

There is a wide social gap that prevents more than one fifth of the world's population from accessing modern electric energy services. Making clean electricity accessible to more people will require the involvement of the international community, the public and the private sector. These objectives of providing access to energy closely relate to poverty eradication goals.

b. *Access to sustainable energy towards development:* Access to modern clean energy services is crucial to accelerate economic and social development. Access to modern energy technology is essential to ensure proper water supplies, sanitation and health care. An efficient and reliable energy supply ensures basic cooking, lighting and heating for households. It also provides energy for mechanical power, transport, telecommunications devices and education.

There is a strong correlation between access to modern energy services and income levels: as income levels increase, access to electricity rises at a faster rate than access to modern cooking fuels, largely because governments give higher priority to electrification. Electricity plays a particular role: lighting and communication are key enablers for better education and training and for participation in international markets.

Two key challenges have to be overcome in order to be able to grasp the opportunities of the widespread use of the cheap electricity: 1) finding ways to finance high upfront costs of electricity, and 2) developing the necessary skills and markets.

c. *Decentralised energy systems:* In some cases providing electricity to remote communities with low power demand can be an expensive option. Decentralised energy solutions thus play an important role, as they do not require a high density of consumers to ensure viability.

Taking electricity to poor households can be accomplished in a variety of ways such as by installing solar panels on homes or by building small hydropower projects close to the end consumer. These small-scale, independent renewable energy technologies (bottom-up solutions) can meet the electricity needs of rural communities at a lower cost than connecting them to the central grid and can replace other more costly energy generation options.

Another promising method for addressing rural electrification is combining different sources of energy in mini-grid systems.

Article 6 - Support by the Organiser

The Organiser shall offer to the official Participants the following support services with regard to the Theme development:

a) Graphic documentation with suggestions and a guide for the Exhibition to illustrate the Theme from different perspectives.

b) A consultancy service for the different development stages of their presentations. The details of the service shall be communicated to all the official Participants.

Article 7. Mechanisms for compliance with the Theme

In accordance with Special Regulation No. 2 on the conditions of participation, Participants shall submit to the Organiser an application for the allocation of exhibition space within the existing buildings.

The Participants must submit, together with the application, a Theme Statement that must follow the theme of the Exposition as described in Articles 4 and 5 of this Special Regulation No. 1.

The Theme Statement shall contain the following at a minimum:

(i) the chosen sub-themes and the perspectives from which the sub-themes shall be presented;

(ii) the description of the general content of the Participant's presentation proposal;

(iii) an indication of which one of the objectives listed in article 3.iii of this Special Regulation No. 1 are pursued with the presentation proposed, and a brief explanation in this regard;

(iv) the inclusion of reference materials on the theme and sub-themes as they will be developed in Participant's presentations; and

(v) the description of the general outline plan for exhibition module, the exhibits or exhibited items and the display supports.

Once the Theme Statement is submitted, it shall be evaluated by the Organiser's Content Department. This Department shall be responsible for the confirmation that the Theme Statement is consistent with the Theme of Astana EXPO 2017, with the general expectations of the Exhibition and with the provisions of applicable Regulations.

If the Content Department determines that the Theme Statement does not follow the guidelines set out in this Regulation, it shall provide the consultancy services to said Participant as a matter of urgency, as described in Article 6 of this Special Regulation No. 1.

After the analysis of the Theme Statement, the confirmation of the aspects above stated and the inclusion of the modifications into the document, if any, the Content Department shall approve the final Theme Statement by notifying the Participant within five (5) calendar days, following the receipt of the final Theme Statement.

The allocation of the Exhibition space to the Participant shall not be considered final until the Theme Statement is approved by the Content Department.

As an integral part of the Application for Preliminary Approval, the Participant shall include a document titled 'Exhibition Project', which must contain a full description of the proposed project to construct and install its exhibition, following the general outline submitted in the Theme Statement. The Exhibition Project shall comply with the provisions and requirements set out in Special Regulation No. 4 related to construction improvements and fire safety.

The Organiser shall ensure that the Exhibition Project proposal is in accordance with the Theme Statement and Articles 4 and 5 of this Special Regulation No. 1.

Notwithstanding the provisions of Special Regulation No. 4 concerning construction or improvements and fire protection, preliminary approval of a project for construction or installation works cannot be granted without approval of the Exhibition Project documentation by the Organiser.

If the Exhibition Project proposal is not approved by the Organiser, the Organiser will prepare a detailed written explanation of the discrepancies and suggestions on how to remedy the problems. Likewise, the Organiser will offer consultancy services to the Participant in accordance with the provisions of Article 6 of this Special Regulation No. 1.

The Participant will modify the contents of their presentation, in line with the Organiser's recommendations. If there is a disagreement between the Organiser and the Participant on the Theme Statement or the Exhibition project, the matter will be referred to the Commissioner of the Exhibition for arbitration. If an agreement is not reached, the provisions established in Article 10 of the General Regulations of the Exhibition will be used to settle the dispute.

Article 8. Catalogue of the Exhibition

With the aim of preparing an official catalogue of the Exhibition, Participants will provide the Organiser with the relevant details of their presentations at least 120 days prior to the Exhibition opening.

Article 9. Measures taken by the Organiser

The Organiser of the Exhibition will contribute to the Theme of the Exhibition by setting up several thematic pavilions and open spaces, whose content and details will appear in specific publications.

As an essential part of the Exhibition, the Organiser plans to host cultural and entertainment activities, as well as conferences, seminars and symposia to be carried out in forums, related to the Theme of the Exhibition. The Organiser shall keep official Participants informed of all such events and forums.

Furthermore, official Participants are invited to further develop the Theme of the Exhibition in similar events of their own. The official Participants must submit to the Organiser their application with the plans on this matter at least six months prior to the opening of the Exhibition. The Organiser may coordinate programs and provide official Participants with logistics assistance, if necessary.

ANNEX I. GENERAL MATRIX OF SUB-THEMES AND PERSPECTIVES

FUTURE ENERGY				
Perspectives to address the sub-themes		Sub-theme 1.	Sub-theme 2.	Sub-theme 3.
Scientific Research:	Scientific knowledge and research areas focused on the future of energy. (Concept development; energy systems; new sources; uses; trends; efficiency; etc.)	<u>Reducing CO₂ emissions</u>	<u>Living energy efficiency</u>	<u>Energy for all</u>
Cutting edge technologies:	Advanced technology solutions: products and services (Power generation; storage; transmission; distribution and consumption; energy systems; security; energy efficiency; comfort; etc.)	Renewable energy	Energy efficiency	Energy against poverty
Governance:	The effects and decisions of public and private governance: National states; regional and local governments; supranational and multilateral bodies; corporations; NGOs and non-profits; and other stakeholders (Management; performance; strategies; policies; guidance; processes and projects; etc.)	A future in hydrogen?	Urban planning and buildings	Access to sustainable energy towards development
Innovative Business model:	Business plans for new energy markets. New types of business. (Technology markets; business opportunities; relationships; entrepreneurs; etc.)	Carbon Capture and Storage (CCS)	Efficient transport	Decentralised energy systems
Value Change:	Value change due to social innovation through social networks and other platforms (such as cloud sourcing), social participation and behaviour change.	Fusion energy	Efficient Industry	

