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From: Melissa Crawford,
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To the attention of Mrs. Christiana Figueres, Executive Secretary, UNFCCC

Subject: Declaration of Support for the Nuclear4Climate Initiative

The International Youth Nuclear Congress (IYNC) is an international Non-Governmental Organization with the mission to:

- Develop new approaches to communicate benefits of nuclear power, as part of a balanced energy mix;
- Promote further peaceful uses of nuclear science and technology for the welfare of mankind;
- Transfer knowledge from the current generation of leading scientists to the next generation and across international boundaries

IYNC is committed to providing and contributing to a solution to climate change and the achievement of greenhouse gas reduction goals through the use of low-carbon technologies.

Attached to this letter, you will find:

The IYNC position paper detailing the views of the IYNC, which represent the views of young scientists from around the world as well as the list of members of the IYNC Board of Directors which have declared their support of this paper.

Sincerely,

Melissa Crawford
President
International Youth Nuclear Congress



IYNC Position Paper Nuclear For Climate

According to the United Nations, the world population in 2015 is 7.2 billion and it is expected to grow to 9.6 billion in 2050¹. Given this projected increase in population and the corresponding growth in economic activity and consumption, energy demand will also rise. Electricity is a vital service for the operation of society's most basic services, such as providing clean water, healthcare, food, communication, and transportation.

Moreover, electricity-generation is the main source of carbon dioxide emissions in the world today; about 70% of the world's electricity comes from burning fossil fuels such as coal, oil and gas². With ongoing efforts to decarbonise the economy, many traditionally fossil-fuel burning activities - such as transportation - are being electrified. This trend will further the burden on the electricity production system. In order to actually decarbonise, the reduction in oil- and gas-burning by vehicles must be met with increased production of clean energy. Despite multiple international efforts, CO₂ emissions have increased by 60% in comparison to 1990 levels³.

Even today, 1.3 billion people do not have access to electricity. In the poorest regions of the world, communities use inefficient, polluting and unsustainable energy technologies which also tend to negatively impact human health⁴.

Climate change, now scientifically accepted as being caused by human activity by the *Intergovernmental Panel on Climate Change*, will have a profound impact on the future of the planet. Any policy agreements regarding greenhouse-gas reductions and sustainable development reached during the CoP21 in Paris in 2015 must be implemented swiftly, to ensure that future generations do not inherit problems which could have been prevented.

Nuclear power plants produce nearly no CO₂ emissions: 15 grams of CO₂ per kilowatt-hour, compared to 11 g CO₂/kWh for wind energy, 45 g CO₂/kWh for solar photo-voltaics, and 400 g CO₂/kWh for natural gas-fired power stations⁵. It comes as no surprise that the world's five largest greenhouse gas emitters – China, the USA, the EU, India and Russia – are looking to develop or maintain their nuclear power industries alongside renewable energy sources and other low-carbon technologies. This is consistent with the Intergovernmental Panel on Climate Change's (IPCC) 1,200 possible scenarios for the limiting of global warming to 2°C. Only eight of those scenarios include phasing out nuclear power⁶.

¹ United Nations Department of Economic and Social Affairs (2015). *World population prospects*. New York, NY.

² International Energy Agency (2014). *Energy technology perspectives 2014: Harnessing electricity's potential*. Paris.

³ International Energy Agency (2014).

⁴ World Bank (2013). *Sustainable energy for all*. Washington DC: Angelou, N. *et al.*

⁵ According to the results published by the European Union's NEEDS project.

⁶ Intergovernmental Panel on Climate Change (2015). *Climate change 2014: Synthesis report. Contribution of working groups I, II and III to the fifth assessment report of the Intergovernmental Panel on Climate Change*. Geneva: Pachauri, R.K. and Meyer, L.A. (eds.)



Nuclear energy has already had a profound effect in limiting climate change. Statistics from the International Energy Agency (IEA) show that the operation of nuclear power stations has avoided the release of 56 gigatonnes of carbon dioxide since 1971. This amounts to two years-worth of CO₂ emissions at current international emissions levels, stopped from entering the atmosphere⁷.

Nuclear power is an integral part of the global energy system, producing 11% of global electricity. In the European Union, it accounts for 27% of total electricity production and 53% of carbon-free electricity⁸. In the USA, nuclear power produces almost 20% of the country's total electricity and 66% of its low-carbon electricity. In comparison, Japan's decision to shut down all of its 48 nuclear reactors after the earthquake and tsunami in March 2011 has resulted in a 6% increase in CO₂ emissions, forcing the country to concede and fail at meeting its targets under the Kyoto Protocol.

Research is ongoing on future energy technologies, including new ways of exploiting nuclear technology in even safer, more reliable and sustainable manners. The future of the nuclear industry lies in two areas: 1) more efficient use of nuclear fuel, which contributes to the transmutation of high-level nuclear waste, making it easier to dispose of or treat; and 2) replicating the inexhaustible power of the sun through nuclear fusion technology. The commercialisation of Generation IV nuclear reactors is anticipated before 2050 and will contribute to the achievement of the first area. The start-up of the ITER fusion reactor being built in France and scheduled for commissioning around 2030 will demonstrate the infinite possibilities of the second. For all of this to be possible, the decision-makers of today and tomorrow must recognise nuclear energy as a necessity.

The International Youth Nuclear Congress (IYNC) is a global network of the new generation of professionals in the nuclear field. As a network of young people, the members of IYNC are dedicated to developing new technologies, designing solutions and solving problems in the nuclear energy industry for the welfare of humankind.

IYNC is committed to providing and contributing to a solution to climate change and the achievement of greenhouse gas reduction goals through the use of low-carbon technologies.

⁷ International Energy Agency (2014).

⁸ International Energy Agency (2104).



IYNC firmly believes that future generations can benefit from the continued use of nuclear energy in several ways.

Firstly, today's young people will have to implement the policies agreed to during CoP21 and achieve the targets set for 2050 and beyond. Over the next 35 years, the portfolio of technologies available to humankind for the achievement of these targets will grow and allow the use of electricity storage, new and more efficient renewable energy sources and systems, and improved nuclear energy technology. The primary purpose of IYNC is to transfer knowledge from the current generation of leading scientists and engineers to the next generation, to allow today's young people to carry out CoP21's charge. We strongly support the development of new ideas and provide a forum for the young generation of today so they can become the innovators of tomorrow.

IYNC needs the new UNFCCC Protocols to be adopted at CoP21 to establish clear goals and define a strong vision for young people to understand and work towards.

Secondly, population growth does not only mean an increase in demand for goods, services and energy – it also means a larger and more diverse workforce. The popularity of nuclear science and technology has fallen over the last twenty years. This has resulted in a similar decline in new specialists entering the nuclear field. In comparison, most predictions of future world energy requirements all point towards nuclear energy being a key part of the solution – the IEA estimates that to limit temperature increases to 2°C, nuclear capacity must approximately double from 400 gigawatts (GW) today to 930 GW in 2050. Achieving this goal will require support for research and development in nuclear energy and all low-carbon technologies, as well as concerted efforts to inspire more interest in young people to enter the sector.

IYNC calls on the UNFCCC to include in its Protocols to be adopted at CoP21 to recognise nuclear technology as an indispensable source of low-carbon electricity and to support research, development and innovation in nuclear science.

Thirdly, each country faces specific challenges in energy and environmental policies, such as level of economic development, security of energy supply, availability of natural resources, transportation networks, and public opinion. It is clear that a shift away from fossil-fuel use in all sectors of the economy will necessitate greater use of electricity. Pollution does not take into



account international borders and politics and neither should electricity. Therefore, tackling climate change should not be based on technology-specific goals which bring with them a bias for or against specific technologies, but on the best possible means and combination of solutions to achieve the required result of decarbonisation.

IYNC demands that the UNFCCC recognise technology neutrality in energy policy for the decarbonisation of the energy system in the Protocols to be adopted at CoP21.

Finally, communication, international cooperation, and technology transfer are at the heart of tackling problems on a global scale. In the 1950s and 60s, the first nuclear power reactors developed in France were based on designs from the USA. Similarly, the indigenous reactor designs developed in China in the 1990s and now are based on a transfer of technology from France and the USA. IYNC is committed to the development of new approaches to communicate the benefits of nuclear power as part of a balanced energy mix. Only through international cooperation and an open and transparent sharing of ideas and experiences can we maintain and increase the level of technical know-how in energy engineering and science.

IYNC proposes that the international community set up global forums where intra-technology and inter-technology communication can be conducted freely, openly and scientifically to achieve a balanced energy mix worldwide.

The members of IYNC are committed to solving existing problems and issues and working together with all energy technology sectors to achieve all of the above.



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