

The case of Seoul's Regional Energy Policy and Nuclear Energy

The 2015 Paris Climate Conference (COP21) called the world's attention to climate change and its disastrous effects on present and future quality of life. With studies pointing to increased global warming by four degrees Celsius by 2020, 195 participating countries attending the conference were motivated to reduce carbon pollution through innovations in energy and fuel technology, among other initiatives. The product of the conference was a "legally binding global climate deal" which set out to reduce global warming by two degrees Celsius¹. In November of 2016, during the United Nations Climate Change Conference, World Nuclear Association Director Agneta Rising stated: "Electricity is a vital part of our modern world. Full global access to reliable and affordable electricity supplies is essential. To meet the climate change objectives of the Paris agreement this must be achieved using all low carbon sources of electricity. Nuclear is a proven source of low carbon electricity. It promotes the mitigation of greenhouse gas emissions while fostering sustainable development."² Yet, despite increased awareness in climate change, the same level of civic awareness and participation is lacking in the nuclear energy industry—an industry that produces carbon-free energy in a moderate to large scale.

Instead, nuclear energy is most known for catastrophic accidents and large scale armed weaponry. Accidents at the Three Mile Island, Chernobyl, and Fukushima nuclear plants have left the nuclear industry deeply tarnished. The lasting impacts from fatalities and environmental damage as a result of nuclear plant accidents create a conundrum for countries looking to nuclear

¹ "Paris Agreement | Climate Action."

² "Nuclear Must Be Part of the International Response to Climate Change - World Nuclear Association."

energy as an energy staple. The industry's origin (and continued use) for national defense, in conjunction with media coverage of accidents, continue to be a source of negative public perception. In light of this negative perception, countries such as the United States, India, France, and Canada continue to develop their respective energy portfolio with nuclear energy as a carbon-free solution.

Surprisingly, in the Republic of Korea, the Seoul Metropolitan Government (SMG) is taking a different approach with its "One Less Nuclear Power Plant" initiative under the Seoul Sustainable Energy Action Plan. This paper seeks to analyze SMG's "One Less Nuclear Power Plant" initiative and identify how the stigma of nuclear energy may be overcome through civic engagement approaches conducted by SMG in other urban planning avenues. Specifically, this paper will look into the path of origin, current status, and future implications of the "One Less Nuclear Power Plant" initiative.

On March 11, 2011, the Northeast coast of Japan experienced a 9.0 magnitude earthquake which triggered a disastrous tsunami causing serious flooding throughout the area. The disasters occurred within hours of each other, and despite the evacuation of over 200,000 locals, there were over 15,000 fatalities, and 5 years later there are still over 2,500 missing³. The third disaster occurred at the Fukushima Daiichi nuclear power plant where three reactors overheated and exploded due to hydrogen buildup, while a fourth reactor leaked radiation in a major water supply.

It is important to understand what transpired at the Fukushima Daiichi nuclear power plant to fully grasp the severity of the accident and understand public opinion in Korea towards

³ "Fukushima Disaster Facts and Figures: What Happened and What Were the Effects of the Nuclear Meltdown?"

nuclear energy. Beginning with the earthquake, which struck approximately 80 miles off the Northeastern Japanese coast at 2:44pm, the impact exceeded the maximum tolerance of impact for reactors 1, 2, and 3. As a result, the reactors' emergency protocols were triggered, and they automatically shut down in response to potential structural damage preventing further damage and begins by cooling the reactor core. The cooling process of a reactor core depends on a cold water pumping system, unfortunately, the earthquake compromised the power source of the plant which then left 13 generators to complete the task.

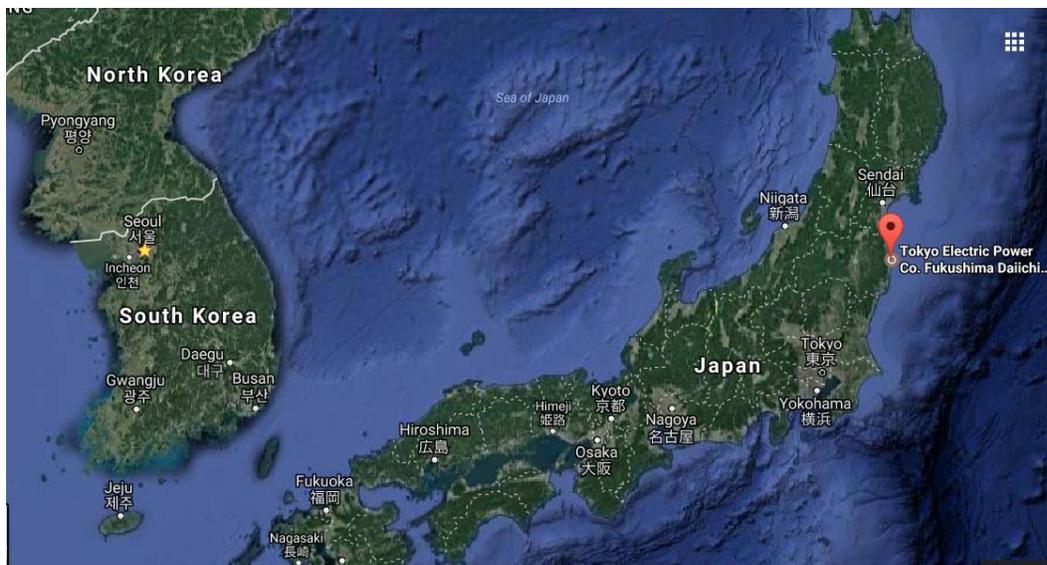
The seismic activity triggered the 45 foot tsunami less than hour later that breached the plant's seawall immediately flooding lower levels where the generators were located. The flooding compromised 12 of the generators leaving a sole generator to unsuccessfully cool down three reactor cores. Unable to cool down, the reactors overheated and generated alarming amounts of hydrogen that ultimately caused explosions within reactors 1, 3, and 4. Although React 2 did not explode, throughout the crisis, it was found to have leaked radiation into flood waters. Five years after these tragic events, radiation contamination has prevented residents from returning, cleanup efforts have yet to address highly radioactive nuclear fuel, and costs are estimated to exceed \$170 billion to decommission the plant, accounting for damage and cleanup costs, and payments to residents⁴.

Within the same year as the Fukushima Daiichi plant disaster, the Republic of Korea suffered a nation-wide energy blackout on September 15th that propelled the need to re-evaluate energy consumption and production. With the Fukushima Daiichi nuclear plant disaster fresh in the mind of the public, and its close proximity to Seoul, public confidence in nuclear energy

⁴ Negishi and Pfanner, "Fukushima Still Rattles Japan, Five Years After Nuclear Disaster."

sharply declined. As SMG began to evaluate energy needs, public concern and opposition led to the “One Less Nuclear Power Plant” as the primary component under the Seoul Sustainable Energy Action Plan—a plan derived as a solution to address the city’s energy crisis and positively contribute to climate change policy needs⁵.

The map below, courtesy of Google Maps, displays the close proximity of the Fukushima Daiichi Nuclear Plant to Seoul, South Korea. Given the magnitude of the Fukushima nuclear plant disaster and the lasting environmental impacts in such close proximity, it is easy to understand why fear of another potential nuclear disaster in Seoul has impacted public opinion and energy policy making.



This sentiment is best exemplified by the 2015 polls in the Yeongdok and Samcheok districts, where residents opposed the construction of new nuclear energy plants by an overwhelming majority vote⁶. The polls highlight the recent distrust of nuclear energy as

⁵ “5. One Less Nuclear Power Plant -,” January 30, 2015.

⁶ Cha, “South Korea’s Nuclear Energy Future.”

impacted by those 2011 disasters. The Yeongdok and Samcheok districts lie along the eastern coast of South Korea and a few hours from Seoul. Despite contributions from nuclear energy to South Korea's economic growth, and the continued operation of 24 active nuclear plants throughout the nation, it is natural to speculate if nuclear energy will have a future in Korea⁷.

The Seoul Sustainable Energy Action Plan, sought to promote energy self-reliance and sharing, reduce electricity consumption, increase renewable energy, and address opposition to nuclear plants. In doing so, SMG's goal was to increase renewable energy self-reliance from 3% in 2011 to 20% by 2020⁸ and reduce dependence on nuclear energy.

The Korea Nuclear Energy Agency, is an established advocacy organization that seeks to “promote understanding of the peaceful use of nuclear energy among the public.”⁹

Organizations like KNEA are necessary for the dissemination of information to the public and a better understanding of nuclear energy, the contributions that it can offer environmentally, economically, and with regards to energy security—as well as educate the public regarding the risks involved with the energy source. KNEA's main projects consist of the following four tiers; 1) increasing public confidence through the dissemination of information via mass media and an online presence, as well as, educating social organizations and Women; 2) promoting future generations' understanding of nuclear energy and radiation through the inclusion of nuclear in curriculums, educational programs, cultural events, representation domestically and in international arenas; 3) sharing knowledge through collaboration with the IAEA, conducting public relation activities regarding nuclear policy, and promoting public acceptance of nuclear;

⁷ Ibid.

⁸ “5. One Less Nuclear Power Plant -,” January 30, 2015.

⁹ “KNEA - Korea Nuclear Energy Agency.”

and 4) contracting projects such as the exporting of nuclear power plants—an important contributor to the national economy.¹⁰

So why, then, would a country exporting nuclear power plant technology be entering the second phase of the “One Less Nuclear Plant” initiative aimed at reducing dependence on nuclear energy? This among other questions remain ambiguous. During the 2016 Case of Seoul Case Study hosted by SMG at the University of Seoul, a recurring topic of discussion was an impending reunification with North Korea. As Korea considers reunification, chief among issues of concern should be energy stability and the role that nuclear energy can play to achieve both stability and carbon-free energy. SMG has a unique opportunity to revitalize the nuclear energy locally, nationally, and internationally through proven means of civic engagement to change public opinion significantly impacting the future outcome of climate change.

The Seoul Metropolitan Government (SMG) has been a leader in citizen engagement through several innovative and technological advances in public administration areas. These include the creation of an “Aging Service Design,” which incorporates an elderly friendly street, also known as, “Rakui Street 7” in the Tapgol Park area¹¹; a “Women friendly policy,” consisting of the creation of Seoul’s Women Plaza, women-friendly paths and parking¹². SMG’s award winning policies seek to create inclusive and equal society building for citizens. In this spirit, SMG has created multiple web platforms to promote citizen participation in urban policies.

South Korea’s leading presence in public administration, technology, and civic participation are key ingredients to reviving the industry. Unfortunately, public trust in nuclear

¹⁰ “KNEA - Korea Nuclear Energy Agency.”

¹¹ “Seoul Creates Elderly Friendly Street Around Tapgol Park | Seoul Metropolitan Government.”

¹² “Seoul Foundation of Women & Family > Introduction to SFWF > Introduction.”

energy will not be the only challenge for South Korea as we look to the future and the possibility of reunification with the North. Yet it is the desire for reunification which may yield support for a review of the “One Less Nuclear Plant” policy. In addition to regaining trust in nuclear energy, South Korea will need to regain public confidence in the national government.

On December 9, 2016, South Korea’s parliament voted to impeach President Park Geun-hye as a result of a political scandal which led to formal motions with accusations of constitutional violations.¹³ The impeachment came after two months of peaceful civilian protests and extensive media coverage of the scandal which generated international concerns regarding South Korea’s presence as North Korea continues to defy international consent of nuclear armament tests.¹⁴ Through the peaceful act of former President Park’s impeachment, South Korea has demonstrated effective civic participation with effective political action—where other countries have endured violent protests, civil suppression, media suppression, South Koreans achieved their goal of impeachment in a democratically mature and peaceful manner.

Undoubtedly, many successful cases of civic engagement and implementation within urban planning exist within South Korea—and while cases such as the implementation of Women parking spaces may not be the ideal answer to promoting a Women-friendly city, the intentions to uphold citizens’ values lie at the forefront of policy making. It is a fine line that must be acknowledged, however: at what point does public perception and fear outweigh proven facts and benefits as it pertains to nuclear energy? More importantly, at what point will SMG guide citizens to reconsider a feasible solution to its energy needs? Two very pertinent questions

¹³ Sang-hun, “South Korea Embarks on Period of Uncertainty With Leader’s Impeachment.”

¹⁴ Ibid.

that require further consideration and research into progressive nuclear policy, South Korean nuclear energy regulatory agencies, and civic engagement studies specific to South Korea.

In the case of South Korea, incorporating the element of civic engagement that has been critical to the nation's success through transparency of policies, licensing procedures, and regulatory processes may assist in promoting a nuclear energy policy that is favorable to citizens, energy goals in preparation for reunification, and carbon reduction goals. Furthermore, it is essential to develop collaborations with organizations such as the Nuclear Energy Institute, strengthen relationships with the International Atomic Energy Agency (IAEA), and leading international academic institutions. While collaborations are important in the industry, as is information sharing with regards to standards development, operational technology, nuclear energy policy, as well as, research and development through the participation and hosting of conferences and publications.

A study of existing regulatory agencies such as the Nuclear Regulatory Commission (NRC), an independent regulatory agency in the United States, can serve as a benchmark to the creation of processes, procedures, and policies as they impact regulation. The NRC, established in 1974 by Congress, regulates commercial nuclear reactors and power plants, nuclear materials used in medicine and research, as well as, nuclear waste and decommissioning of plants.¹⁵ Through policy making, licensing, and inspection, the NRC enforces active regulations. To further improve a regulatory body such as the NRC, active engagement with the commercial nuclear energy industry, respective energy commissions/ministries/departments, academia to ensure that leading research and technologies, current policy-makers, and energy market expert

¹⁵ "NRC: About NRC."

input is necessary in the crafting or modification of licensing regulations. Additionally, it is important to consider how funding models for a regulatory body are framed.

The NRC's annual budget is funded by Congress, as such, budgets for the commission are dictated and passed by Congress which is exposed to the influences of the majority political party holding seats in Congress, as well as the current president's political agenda. As reactor technology evolves, such as with the introduction of Small Modular Reactors (SMRs) and Very Small Modular Reactors (VSMRs), including major improvements to Light Water Reactors (LWRs) and nuclear fuel, the NRC is unable to keep up in both regulating and licensing such advances due to a shortage in staffing/access to experts imposed by the limitation of the budgeting process which entails extensive review at the congressional level. In 2016, the NRC's budget consisted of \$1,002.1 Million assigned as follows; \$51 Million to Research; \$43 Million towards the Reactor Program; while only \$6 Million were assigned to New/Advanced Reactor Licensing; and \$2 Million to Materials and Waste.¹⁶ As a result, the budgetary limitations within the NRC contribute to increased deferment in a ponderous licensing process for new reactor and nuclear waste management technology--two of leading apprehensive topics for the media and general public. Performance and accountability is reported to a Congressional committee consisting of representatives nominated into the committee where it may be more appropriate to report to a committee or board of industry experts.

Finally, with the looming impacts of climate change it is imperative to recognize the role of civic engagement and how public administration has positively influenced change in Seoul so that we may diversify expertise in conversations of nuclear energy policy regionally and

¹⁶ "NRC: Information Digest, 2016-2017 (NUREG-1350, Volume 28)."

Cindy Rodriguez
Cornell University
Email: cgr45@cornell.edu

Presented by: Ron Rigores

internationally. This collaborative effort consisting of civic engagement, public administration, nuclear energy industry participation, transparent energy policy-making, and other renewable energy sources may be the key to further Seoul's goal of clean energy.

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Cindy Rodriguez
Cornell University
Email: cgr45@cornell.edu

Presented by: Ron Rigores

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