Seoul, Republic of Korea

The "One Less Nuclear Power Plant" initiative

ICLEI Local Governments for Sustainability

Seoul's "One Less Nuclear Power Plant" initiative aims to save and generate energy equivalent to the capacity of one nuclear power plant. Energy self-sufficiency and the energy supply to the city will be improved. Safe and sustainable energy sources will be increased. Greenhouse gas emissions will be reduced.

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Abstract

Seoul's "One Less Nuclear Power Plant" is an ambitious initiative which demonstrates the city's leadership on this issue nationally, regionally and globally. Based on 10 wide-ranging key action plans, various actors –political leaders and experts as well as citizens – are coming together to save enough energy to switch off one nuclear power plant.

The city will become smarter, more efficient, greener, more modern and more self-sufficient. The numerous actions that the Seoul Metropolitan Government is taking to reach its ambitious aims include setting higher energy efficiency standards for existing and new buildings. By 2014, Seoul plans to build rooftop photovoltaic (PV) plants on about 10,000 buildings for a total capacity of 290 MW. Throughout the city 7,815,000 lights will be replaced by efficient LED lamps. All 16,600 public bus drivers will be trained in green and economic driving.

The importance of this issue

Seoul's power consumption accounts for 10.3% of the national total in South Korea. However, only 1.6% of energy consumed in the city comes from new and renewable sources, and Seoul's power self-sufficiency rate is a meager 3.0%. Furthermore, the continued rise of global oil prices makes a new paradigm of energy policy even more necessary.

Nuclear energy is cheap and efficient. However, it incurs enormous human, environmental and economic cost once something goes wrong, as was seen in the Fukushima nuclear disaster. Seoul is therefore committed to reducing its dependency on nuclear power by promoting sustainable and ecofriendly energy sources.

Finally, about 90% of greenhouse gases warming the globe come from the generation and consumption of energy. Thus this initiative will directly address the planetary challenges of climate change and global warming.

Name of Municipality
Seoul Metropolitan Government

Population / Land area
10.5 Mill. / 605 km²

Municipal budget
Approx. $20,600 Million (2011)

Seoul joined ICLEI in April 1999 and has been a host city of ICLEI East Asia Secretariat since October 2012

원전하나줄이기
햇빛도시

Sunshine City,
One Less Nuclear Power Plant

Case Study

The city context

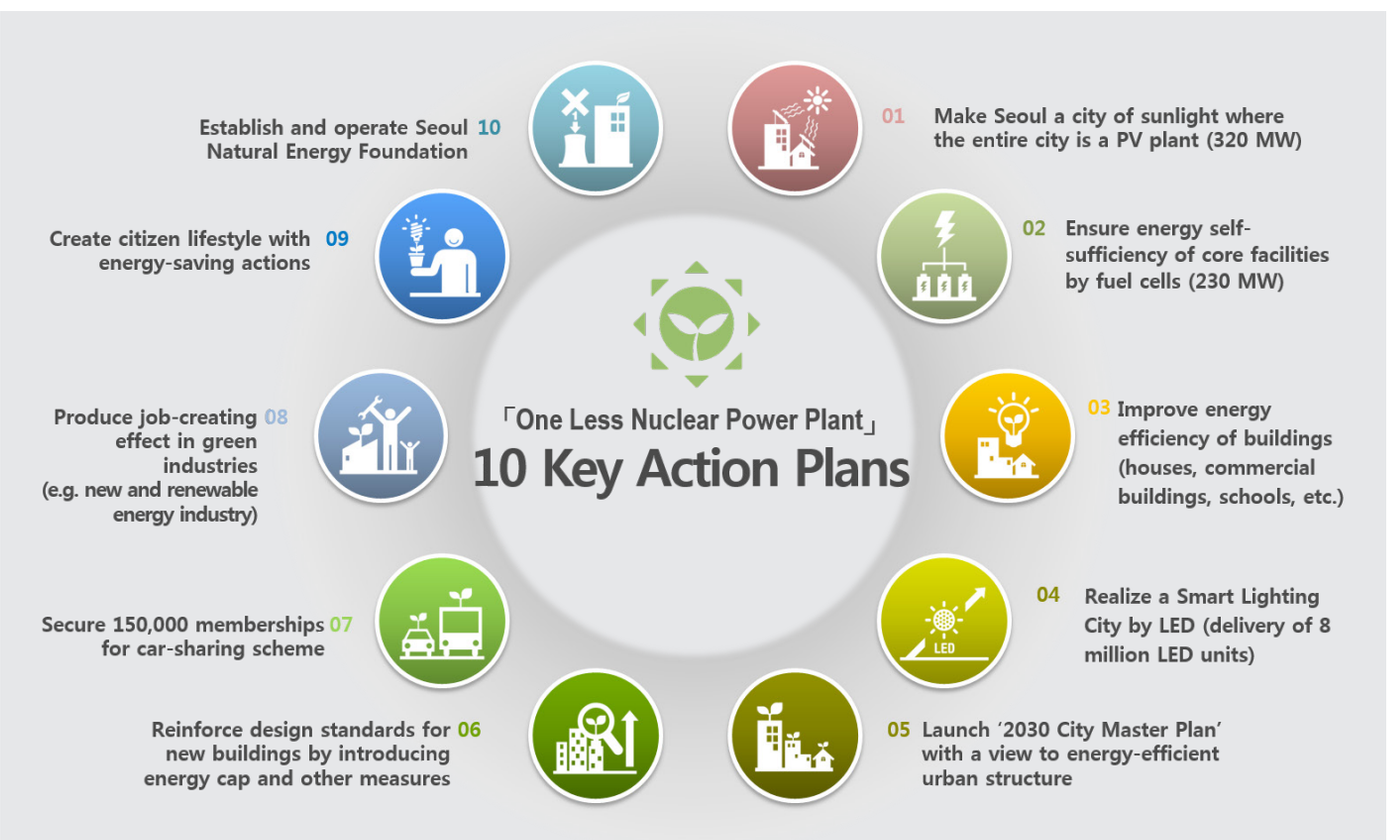
Seoul consumes 15,496,000 TOE (tonnes of oil equivalent) of energy per year, 7.5% of South Korea's national total. Of this energy consumption, 56% comes from residential and commercial use. The problem is that Seoul is too dependent on fossil fuels, with oil and liquefied natural gas (LNG) accounting for 38.9% and 29.7% of the energy mix respectively.

New and renewable energy (NRE) production still merely contributes 1.6% of the city's total energy consumption with a recorded 250,000 TOE produced by Seoul in 2011. Out of the total NRE production, 93.85% came from biogas and waste and 2.2% from solar photovoltaic and heat energy.

After Mayor Park Won-soon assumed office in October 2011, in April 2012 Seoul City took a set of initiatives to mobilize the wisdom of citizens in shaping this initiative. Seoul organized a citizens commission of 17 reputable figures from civic groups, the business and media arena as well as religious, educational and cultural sectors, in order to garner its citizens' power.

How to save enough energy to switch off one nuclear power plant

The campaign consists of 71 specific projects in 6 policy categories, which can be categorized into the 10 following key action plans.



Expected Results

The initiative only started in 2012, therefore most results have yet to be achieved, but the Seoul Metropolitan Government has set clear goals and expects the following to be realized:

- Reducing 2 million TOE from the city's energy demand by 2014. This is equal to replacing the capacity of Wolseong Nuclear Power Plant Unit-2 (790,000 TOE) and saving 1.21 million TOE of oil and LNG gas consumption.
- Cutting greenhouse gas emissions by 6.06 million tCO_2 by 2014. This is the equivalent to creating a forest of 7,330 km^2, 1,629 times the area of Yeouido Island (4.5 km^2) and 12 times the area of Seoul (605 km^2).
- Reaping economic benefits of about USD 1.53 billion from replacing oil imports and creating 34,000 new green jobs.
- Increasing Seoul's power self-sufficiency to reach 8% by 2014 and 20% by 2020 in order to ensure a stable power supply for the capital.
- Within the first year, 2012, numerous citizens and stakeholders – companies, civil society, schools, religious groups – joined the initiative and started energy saving activities.

1. Becoming a city of sunlight

By 2014, Seoul plans to build rooftop photovoltaic (PV) plants on about 10,000 buildings for a total capacity of 320 MW. Seoul will also build PV power stations able to produce the equivalent of 30 MW in idling spaces such as water and sewage facilities as well as public parking lots. The City will create resident-led energy independent communities where new and renewable energy is produced on site, and external energy supply will be kept to a minimum level. Seoul aims to create 25 of such energy independent communities by 2014. The Seoul Solar Map has been developed to show all buildings and houses with the possibility to install PV plants and their potential capacity, which allows Seoul's PV power generation status to be understood at a glance. The map is presented on the City website in order to increase citizen engagement in PV promotion.

2. Increasing energy self-sufficiency

In order to guarantee core public facilities remain operational, even if a sudden large-scale blackout occurs, Seoul will build hydro fuel cell stations and small scale hydro plants to ensure a permanent power supply. Seoul will install hydro fuel cell power generators with a total capacity of 230 MW in 13 sites, ranging from subway car depots, water supply and sewage facilities, to hospitals, hotels and schools by 2014. Small-scale hydro power plants will be built at the tributaries of the Han River as well as at five water supply and sewage facilities for a total capacity of 1 MW. In addition, smart meters for households will be distributed and sports equipment with integrated power generation and storage devices installed in 34 municipal fitness centers.

3. Improving energy efficiency of existing buildings

From 2011-2014, Seoul will implement a Building Retrofit Program on over 12,000 buildings including high-energy-consuming buildings, mid-to-large-sized buildings, individual houses, office buildings, public rental houses, municipal welfare facilities and schools. Through the Building Retrofit Program, energy leakage will be prevented and energy efficiency improved.

Transition to LED without cost burden

Seoul signed a tripartite MOU with the Korea LED Association and LG electronics corporation, in order to distribute LED at a price 40% lower than the market price, even including a five-year warranty. The Korea LED Association takes an "invest first and recover costs later" approach — the association installs the LED lightings first and then recovers the invested costs over the span of 3.5 years thereafter from saved electricity fees. This will allow citizens to opt for LED lights without the burden of greater initial costs.

4. City of smart lighting

Seoul will replace lighting devices in public offices, street furniture, subway stations, underground shopping centers, large office buildings, department stores and other multi-use facilities with highly energy-efficient LEDs. The total number of lightings to be replaced amounts to 8 million.

5. Low-energy compact city

Seoul will become an eco-friendly city with low greenhouse gas emissions by being upgraded into a low-energy-consuming compact city. Towards this goal, Seoul will expand the application of an energy cap from building designs to overall urban development plans, and strengthen renewable portfolio standards.

6. Standards for new buildings

In order to reduce the 55.9% of total energy consumption that comes from residential and commercial buildings, an energy consumption cap and energy-saving design standards will be applied to all new constructions of small-to-mid-sized buildings as well as large buildings, starting from 2013. Currently, the energy cap is mandatory only for some large buildings such as commercial buildings with floor space over 3,000m^2 and apartment complexes with over 100 units.

7. Green transport

Shifting ideas and citizen attitudes about cars can have significant environmental benefits. In this era of high oil prices, car-sharing can help save energy, reduce pollution and save expenses incurred by owning a car. Campaigns will therefore aim to shift the paradigm about cars from 'ownership' to 'co-drivership', car-sharing means using cars together with other people only when they are needed. Improvements will also be made to the bus network in the city. Green & economic driving training sessions will be provided for all 16,600 public bus drivers.

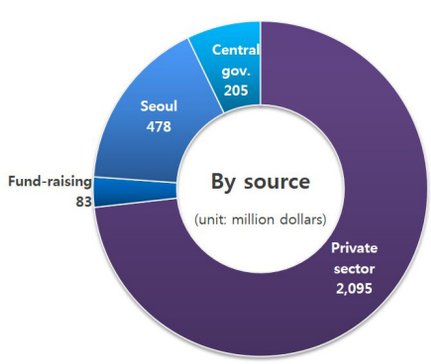
8. Creating green jobs

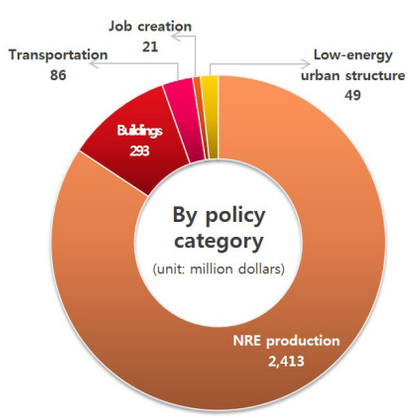
The United Nations Environment Program (UNEP) defines green jobs as work in agricultural, manufacturing, research and development (R&D), administrative, and service activities that contribute substantially to preserving or restoring environmental quality. Seoul invests in the creation of green jobs with a long-term point of view, in order to develop the capital city into a green city that fulfills responsibility for the environment of the Earth. Seoul will create a "Green Startup Creation Fund" worth 60 billion KRW (about 53 million USD),

Budget

Total 3.24 trillion KRW (appox. 2.9 billion dollars)

- **$478m from Seoul;** $83m from fund-raising; $205m from the central government; $2.095b from private sector





nurture talents and experts, support small and medium enterprises (SMEs) and organize an annual Green Energy Jobs Expo.

9. Energy-saving lifestyle of citizens

In order for citizens to take the lead in the energy saving movement, Seoul is organizing the "Energy Guardian Angels": young students recruited by schools, who are leaders of the next generation in energy saving and volunteer activities. Seoul had aimed to recruit 3,000 students by the end of 2012 and 10,000 by 2014. At the end of 2012 already 9,745 young people had joined. Based on this success the new target for 2014 is to expand the Angel corps to 20,000 members in 400 schools.

Credit: iStock 2010 Min-Gyu Seong

Seoul by Night

The brand-new Seoul Energy Dream Center is the first public building to achieve 100% of energy self-supply and serves as a learning center to students and citizens. Seoul also aims to recycle 168 tons of waste per day by 2014 and preventing waste creation by reducing food waste to 669 tons a day by 2014.

Replication

Since the One Less Nuclear Power Plant initiative was only started in April 2012, it has not yet been replicated. There is the potential for similar initiatives to be adapted and replicated in cities around the world. How could your city join Seoul in leading the world on this path?

Seoul's Eco-mileage program won 2013 UN Public Service Awards

The Seoul Metropolitan Government 's Eco-mileage program is a component of the "One Less Nuclear Power Plant" initiative that won the Excellence Award of the 2013 United Nations Public Service Awards in the category of fostering participation in public policy decision making through innovative mechanisms.

Eco-mileage is a program to engage citizens in the reduction of GHG emissions. It allows citizens to easily obtain information on their amount of energy usage in water, electricity as well as gas, and gives them incentives including mileage in return for their energy saving. Accumulated mileage can be used to purchase eco-friendly products as well as to get financial support for retrofitting existing buildings.

As of July 2013, one million households and buildings had signed up for the program. The amount of energy saved by the participants from Sep. 2009 to Apr. 2013 is 160,000 TOE equivalent to 500,000 ton of GHG reduction.

10. Establishing Seoul Natural Energy Foundation

Seoul creates a foundation to lead the energy policy shift and implement the projects in a more organized way. Provisionally named "Seoul Natural Energy" Foundation," it reviews proposed energy policies to make improvements, and reflect feedback arising in the course of implementation. There will also be a center for public information and a center in charge of relevant research.

Replication

The decisive action shown by the Mayor of Seoul, Park Won-soon with his One Less Nuclear Power Plant initiative inspired the 2012 Seoul Declaration of Local Governments on Energy and Climate Mitigation. The declaration encourages other cities to realize a nuclear-free future with the message that it is not only attainable but crucial in order to guarantee low-risk, livable cities worldwide.

The Declaration engages Members and fellow cities throughout the globe to forge a path towards a nuclear-free future though five key steps:

1. Reduce the use of fossil and nuclear energy in consumption by 2020 as compared to 2010 levels

2. Define/scale-up energy efficiency and climate mitigation targets for 2020/2030

3. Mobilize financial resources via local, sub-national, national and international channels with urban stakeholders

4. Report progress to ensure transparency to the Mexico City Pact Secretariat and carbonn Cities Climate Registry

5. Encourage local governments worldwide to be inspired be others commitments

The 2012 Seoul Declaration, created in partnership with the ICLEI Global Executive Committee and World Mayors Council on Climate Change following other ambitious declarations from recent years, including the 2010 Global Cities Covenant on Climate, the Mexico City Pact, the 2012 Belo Horizonte Resolution of World Mayors Council on Climate Change, and fortified by ICLEI's Low Carbon City Agenda. With the Declaration, Seoul and other signatories are show that a safe and sustainable urban energy future is not only achievable- it begins with one less nuclear power plant at the time.

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Sources and Further Readings

- "One Less Nuclear Power Plant" brochure, Environmental Policy Division of Seoul Metropolitan Government
- One Less Nuclear Power Plant : http://energy.seoul.go.kr/ (in Korean)
- Eco-mileage : http://ecomileage.seoul.go.kr (in Korean)
- Seoul Declaration: http://www.worldmayorscouncil.org/fileadmin/Documents/Seoul/2012_SeoulDeclaration_ofLocalGovernments_onEnergyandClimateMitigation.pdf

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SEOUL METROPOLITAN GOVERNMENT

ICLEI – Local Governments for Sustainability is an international association of local governments implementing sustainable development. ICLEI's mission is to build and serve a worldwide movement of local governments to achieve tangible improvements in global sustainability with special focus on environmental conditions through cumulative local actions.

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