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## Berlin's Energy & Climate Protection Program (BEK) and Seoul's One Less Nuclear Power Plant (OLNPP) Initiative

22nd REFORM Group Meeting „Energy Democracy and Climate Change Policy“  
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# Agenda

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## Berlin's Energy & Climate Protection Program (BEK)

- Key figures for Berlin
- Berliner Energiewendegesetz (BerLEWG)
- Energie- und Klimaschutzprogramm 2030 (BEK 2030)

## Seoul's One Less Nuclear Power Plant Initiative (OLNPP)

- Key figures for Seoul
- Phase I
- Phase II

## Berlin – key figures

- Berlin – 3.6 Mio. inhabitants, Area 892 km<sup>2</sup>, population density 4,039 cap/km<sup>2</sup>
- 1.917 Mio. Housing units (2016)
- 3,200 Mio. EUR/year for fossil energy – 13.5 Mio. t CO<sub>2</sub>/y
- 6,600 public buildings, 300 Mio. EUR/y – 1 Mio. t CO<sub>2</sub>/y
- Number of cars: 1,350 Mio. (2012) – 358 cars/1.000 inhab.
- Primary energy consumption: 263,2 PJ (2015)
- Final energy consumption: 228.7 PJ (2015)

## Berlin – key figures

- 2,324 MW installed capacity of power stations
- RES
  - 87 MW solar PV
  - 12 MW wind
  - 36 MW waste
- Electricity generation: 7,467 GWh (2015)
- Of that RES: 351 GWh – and others: 183 GWh

## Berlin - BerIEWG

- Already in 2009, the government tried to adopt a Climate Protection Act for the state of Berlin. 2010 the project was abandoned
- In 2016, the Energy-saving Act, which was directed purely at the energy sector, was replaced by the BerIEWG
- The BerIEWG is a framework law designed to create the framework of action for climate and energy policy in Berlin
- The BerIEWG entered into force on the April 6, 2016

## Berlin – BerlEWG 2

- The goal is to make Berlin a climate-neutral city
- Climate protection targets: Reduction of CO<sub>2</sub> emissions up to 2020 by at least 40%, up to 2030 by at least 60% and up to 2050 by at least 85% against emissions in the year 1990
- The addressee of the BerlEWG is the public sector. Directly obliged are the Senate and the districts
- The Senate is obligated to set up and implement a Berlin energy and climate Protection program (BEK) with the involvement of the public. In addition, strategies and measures for adaptation to climate change are to be developed within the framework of the BEK

## Berlin – BerIEWG 3

- The law is also aimed at the education sector. Climate change, climate protection and adaptation to climate change and energy efficiency should be more integrated into school and pre-school education
- The energy sector is to use more renewable energies and build a safe, inexpensive and climate-compatible energy generation and supply with electricity and heat
- Monitoring is enshrined in order to control the implementation of the objectives and the Monitoring reports should be presented every 2 years and the BEK shall be updated

## Berlin – BerIEWG 4

- In September 2017, a Climate Protection Council was formed to advise the Senate and the parliament on climate protection and energy policy issues, to monitor compliance with climate protection targets and to accompany the "update".
- The Climate Protection Council consists of nine members who come from science, industry and associations.
- In November 2017, the First amendment of the BerIEWG entered into force. The amendment was carried out against the backdrop of the Paris climate agreement. Energy production from lignite is to be completed by the end of 2017 and from coal until the end of 2030





## Berlin – BEK 2030

- In June 2017, the Senate adopted the BEK 2030 and the parliament passed the BEK 2030 on January 25, 2018 2030
- Within one year after the constitution of a new city parliament, the BEK 2030 is updated based on the monitoring report
- The BEK 2030 includes 107 climate protection measures for the implementation period up to 2021 and the development horizon 2030
- Key elements are the sufficiency and efficiency of energy as well as the increased production and use of renewable energy

## Berlin – BEK 2030 2

- Until 2030, the CO<sub>2</sub> emissions of the Berlin administration are to be organized in a CO<sub>2</sub>-neutral way
- The Berlin administration includes the Senate and the district administrations – but not the subordinate authorities, institutions or own companies
- The public building stock is to be fully energetically renovated – establishment of rehabilitation timetables and the establishment of an energy management system for public buildings are demanded
- The districts are encouraged to create their own energy and CO<sub>2</sub> balance sheets, formulate targets to reduce CO<sub>2</sub> emissions and implement energy saving in public buildings

## Berlin - BEK 2030 3

- Climate protection agreements between the Senate and private legal entities and partnerships with majority participation of the country, universities and university medical institutions are to be closed
- It is an instrument of self-commitment by these actors, which contribute to the achievement of the objectives of the BerLEWG with concrete activities. The climate protection agreements shall apply for at least ten years
- At present, Berlin has 13 partners with climate protection agreements (including Vattenfall, the Zoo and Animal Park Berlin and the Free University)



## Seoul – key figures

- Seoul – 10 Mio. inhabitants, belongs to the 10 largest cities worldwide - Area 605 km<sup>2</sup>, population density 16,503 cap/km<sup>2</sup>
- Between 2005 and 2014 +500,000 housing units -> 3,603,000
- 1,613,000 (44.7%) Apartments  
1,265,000 (35.1%) single-family houses  
556,000 (15.5%) multi-family houses  
142,000 (4%) town houses  
24,000 (0.7%) flats in industrial establishments
- 2016 22.66% of the area were streets
- 3,093,930 number of cars

## Seoul – key figures 2

- 2015 – electricity consumption 124,333 MWh/day
  - oil consumption 135,000 barrel/day -30.8% less than 2001
  - town gas consumption 11,402,000 m<sup>3</sup>/day
- Final energy consumption 2014: 41.5% Mineral oil products; town gas 27.7%; electricity 25.7% and coal 0.7%  
Renewables quadrupled from 78,000 toe (2003) to 293,000 toe (2014)
- Primary energy supply: 15 Mtoe = 628 PJ
- Electricity peaked with 47.3 TWh (2010). 45.02 TWh (2014)
- Electricity consumption 83.1 households & trade; 9.4% public sector, 4.6% industry and 2.8 transport sector

## Seoul – key figures 3

- Power stations: 781 MW installed capacity (612 MW thermal PS and 169 MW RES)
- Electricity generation 2015: 2,476 GWh = 5.5% of Seoul's total electricity consumption 45,381 GWh
- Growth of RES: PV, fuel cells and geothermic units. Further waste to heat usage. Share of waste and bio energy 89% of RES

## Seoul – Pioneer in Climate Protection Policy

- With the inauguration of Mayor Park Won Soon in October 2011, the new era of energy and climate policy of Seoul began. The first phase of One Less Nuclear Power Plant (OLNPP) 2012-14 had the goal of saving 2 Mtoe primary energy – the equivalent of power generation from a 1,350 MW reactor block – by RES, energy saving and efficiency measures
- The target was already reached in June 2014. Most successful area with 190% was active citizen participation – 910,000 toe instead of planned 480,000 toe
- Target achievement for energy consumption reduction was 63% and for energy efficiency measures 78%

## Seoul – OLNPP

- Reasons for OLNPP initiative (effective contribution slowing-down climate change):
  - Fukushima
  - rolling blackouts in September 2011
  - conflict between Miryang and KEPCO (construction of 765 kV high-voltage transmission line)
  - role of cities in combating climate change
- When mayor Park Won Soon took office in October 2011, he started to inform himself about the background and perspectives of energy & climate policy
- Between January and April 2012 16 meetings with the „Policy Advisory Group of hope“ and citizen initiatives – paper for the public



## Seoul – OLNPP phase I

- Policy Hackaton on April 16, 2012 with over 400 participants
- Presentation of 109 new ideas – e.g. reduction of energy consumption of large buildings, establishment of exclusive streets for public transport and pedestrians
- Establishment of two institutions: OLNPP citizen commission and OLNPP executive committee
- Citizen commission is responsible for change of paradigm (from energy saving to self energy producing city), definition of policy strategy and supervision of action plans
- Executive committee is advisory organ for subsidy plans of the initiative, the action plans and the planning of the next program

## Seoul – OLNPP phase I

- Target of OLNPP phase I was saving 2 Mtoe primary energy – equivalent to the electricity generation of a 1,350 MW NPP until end of 2014 by RES, energy saving and efficiency measures together with the citizens
- Self supply of Seoul shall be increased from 2.95% (2011), to 5% (2014) and 20% in 2020. The initiative started 10 core programs, 21 policy issues and 78 projects in six areas – inclusive the extension of energy production of new and RES
- Many citizen took part in the first two years and the saving target was already reached in June 2014. Active citizen participation was most succesful (910,000 toe instead 480,000 toe = 190% target achievement)

## Seoul – OLNPP phase I

- Target achievement by decreasing energy consumption by energy efficiency measure was 63%, and new electricity generation with RES reached 78% of the target.
- Reasons for missing the targets: it was difficult to find suitable areas for RES in Seoul
- Seoul Sunlight atlas and other information supply led to 70.5 MW new solar installations
- Energy efficiency sector was divided in lighting, architecture and transport
- In 243 subway stations a total of 430,000 LED lamps were changed

## Seoul – OLNPP phase I

- „Green Building Design Criteria“ were launched to reduce energy consumption in buildings. For new construction of 3,000 m<sup>2</sup> stage 2 of energy efficiency requirements are mandatory
- For existing buildings the retrofit program was extended, loans with low rents
- In the transport sector parking in the periphery was expanded to stimulate use of public transport.
- Reduction of bus traffic on holidays (3% less fuel), Eco-driving courses for bus drivers, and early scrapping of diesel cars.

## Seoul – Eco mileage program

- Within the framework of C40, Seoul has set up the eco-mileage program, in which the members collect monthly transport (passenger cars, public transportation) and at the same time the consumption of electricity, water, town Gas and district heating and receive points and premiums.
- In February 2012, the program had 480,000 members, 2014 were already 1.7 million.
- While electricity consumption in South Korea rose by 4.9% between 2011 and 2014, it fell by 4% in Seoul, and even 13.5% in gas consumption.
- In the first phase of OLNPP, 5,635,000 t of GHG emissions were saved

# Seoul's Eco Mileage System



Join  **and Live Green!**



Eco-Mileage Credit Card



Eco-Mileage Check (Debit) Card

In Seoul, 800,000 cards were issued – in South Korea a total of 3.5 million cards. Cardholders are committed to protecting the environment

## Seoul – OLNPP phase II

- On August 2014, the Seoul Sustainable Energy Action Plan was adopted. The objective of phase 2 is to save 4 Mtoe primary energy – the equivalent of two 1,350 MW nuclear power stations – to increase the self-supply ratio of electricity to 2020 to 20% and to reduce GHG emissions by 20 million t of CO<sub>2</sub> eq. to lower
- By the end of 2018, all lighting fixtures (approx. 2.2 million) in the public sector and in the private sector should be replaced by 2020 about 78% (34.68 million) with LED.
- The eco mileage program is expected to have 2.8 million members by the end of 2018 and 1 Mtoe primary energy savings



## Seoul – OLNNP phase II 2

- The OLNNP initiative differs from the energy policy of all former city administrations and many other cities in South Korea
- 1st Pillar: "Citizens' initiative"
- 2nd Pillar: Energy Justice
- 3rd Pillar: Energy governance with public-private partnership in the new Institutions Citizens' Commission and Executive Committee
- 4th Pillar: Formulation and achievement of ambitious objectives
- 5th pillar: Policy platform for innovation in the urban economy
- Challenge: Anchoring the key figures in the city administration



## Berlin & Seoul - Comparison

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- Political will of the mayor/senate, parliament and the city administration/districts
- Financial basis of the two cities
- Energy policy governance
- Public participation in the process
- Eco mileage program
- Establishment of City works
- Reduction of CO<sub>2</sub> emissions

# Thank you for your attention!

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