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Potential Areas of Nuclear Energy Applications in Mongolia



Davaa Suren, PhD

Senior Officer,
Executive Office,
Nuclear Energy Commission,
Mongolia



МОНГОЛ
УЛААНБААТАР
УЛСЫН
МОНГОЛ
УЛААНБААТАР
УЛСЫН

Key Messages:

- **The Parliament adopted the State Policy on Exploitation of Radioactive Minerals and Peaceful Use of Nuclear Energy along with Nuclear Energy Law in 2009. The Government's Action Plan for 2024-2028 reflects the performing of basic studies of nuclear power infrastructure development based on the IAEA's guidance on the Milestones in the Development of a National Infrastructure for Nuclear Power.**
- **Major cities including the capital Ulaanbaatar city are heavily reliant on coal-fired power, which has led to air pollution levels exceeding normal levels. In Mongolia, mining industry occupies the largest place in national production. Therefore, district heating and nuclear energy cogeneration systems may be an option.**
- **Therefore, Mongolia should transfer from coal-based thermal power plants to green energy-mix including nuclear small modular power plants.**

Key policies



VISION 2050

The Mongolia's Long-term Development Policy “Vision-2050” (2020):

Develop a low-carbon productive, and inclusive green economy and contribute to international efforts to mitigate climate change.
(Resolution No. 52, 2020 of the Parliament)



NEW REVIVAL POLICY

New Revival Policy (2021)

‘Implementation of environmentally friendly, science and advanced technology-based energy projects to boost economy. (Nuclear, green-hydrogen, natural gas, and renewable energy projects)’
(Resolution No. 106, 2021 of the Parliament)



STATE POLICY ON NUCLEAR ENERGY

The State Policy on Exploitation of Radioactive Minerals and Peaceful Use of Nuclear Energy (2009).

(Resolution No. 45, 2009 of the Parliament)

Government's Action Plan for 2024-2028



NUCLEAR POWER ACTIVITIES cont...

Government's Action Plan for 2024-2028

NPP among 14 MEGA Projects...

- 1) Cross-border connection railway and cargo transshipment terminal of “Gashuunsukhait - Gantsmod”, “Hangi - Mandal”, “Shiveekhuren - Sekhee” border ports;
- 2) Tavantolgoi 450 MW Thermal Power Plant;
- 3) Erdeneburen 90 MW Hydroelectric Power Plant;
- 4) Egiin River 310 MW Hydroelectric Power Plant;
- 5) Renewable energy and distributed sources;
- 6) Kherlen-Toono and Orkhon-Ongi water pipelines;
- 7) Ereentsav-Choibalsan-Baruun Urt-Bichigt vertical road;
- 8) **An uranium project and nuclear power program (A joint Mongolian-French uranium project);**
- 9) Coal-chemical and coking coal-chemical factory;
- 10) Copper Processing factory
- 11) Steel plant
- 12) Petroleum Refinery factory;
- 13) Gold refining plant based on Oyu Tolgoi project;
- 14) National Satellite.

3. Economic policy

3.3. economic diversification and liberalization

3.3.3. growth and liberalization of the energy sector

3.3.3.7. Implement a policy of building **nuclear power plants** based on uranium reserves and conduct basic study activities

Government's Activities...

- ✓ Establish with **NEPIO**
- ✓ Study all **19 infrastructure issues**
- ✓ Develop to **Pre-Feasibility Study**

THE CURRENT STATUS OF ENERGY SUPPLY IN MONGOLIA



Coal
1566 MWe
82%

1910 MWe



Diesel
7 MWe
0.3%



Hydro
26 MWe
1.4%



Solar
156 MBt
8.2%



Wind
155 MBt
8.1%



Battery
151.1 MWe/486.6 MWe.h

Western

P_{max}=54.4 MWe,

	Hydro	12 MWe
	Solar	10 MWe

P_{baseload} 22 MWe

	Hydro	14.0 MWe
	Solar	15.9 MWe
	Diesel	7.0 MWe

P_{baseload} 36.9 MWe

Battery 1.1 MWe

P_{max}=28.5 MWe

Altay-Uliastai

Central

P_{max}=1765 MWe,

	Coal	1475 MWe
	Wind	155 MWe
	Solar	135 MWe

P_{baseload} 1765 MWe

Battery 150 MWe/
480 MWe.h

P_{max} - 184 MWe

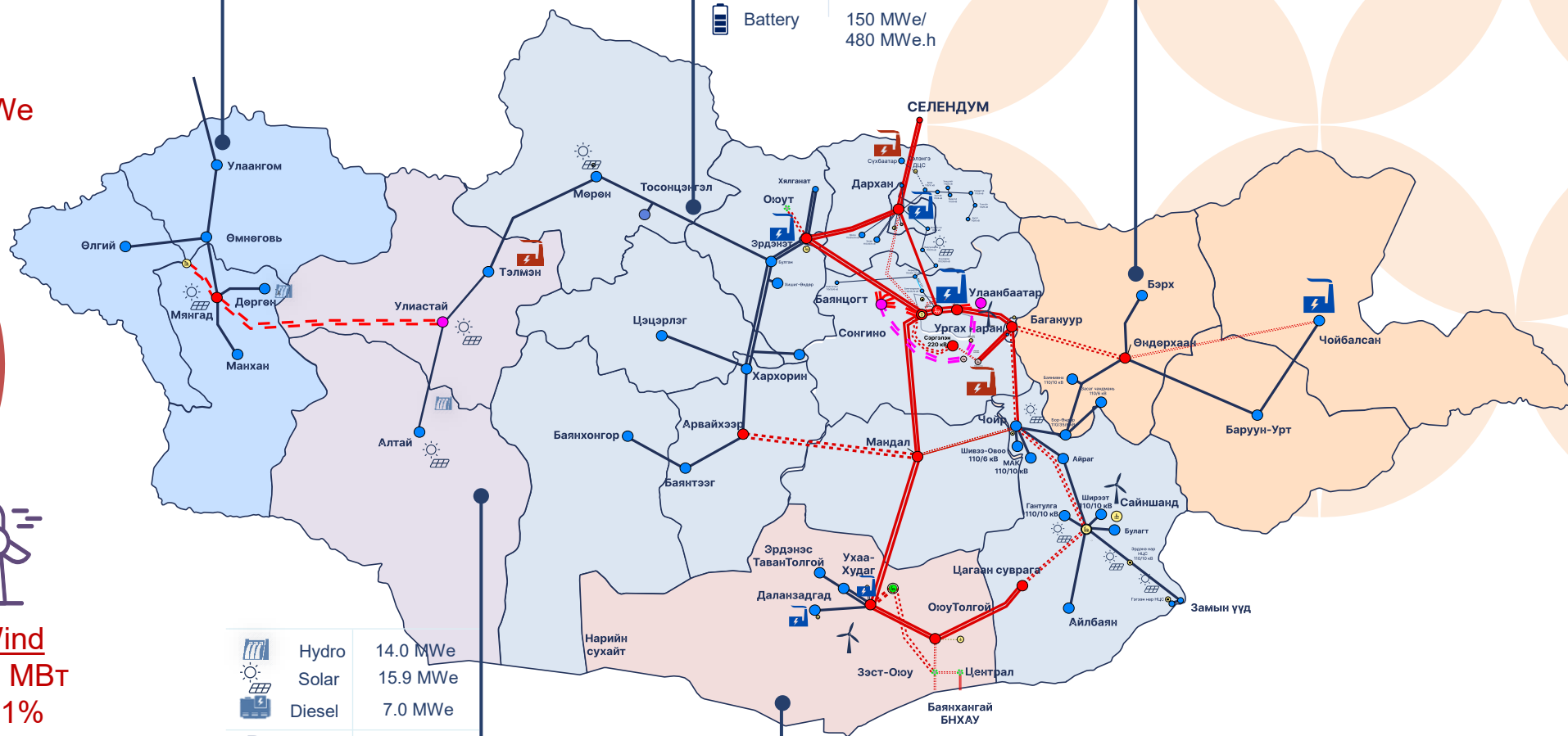
Southern

Eastern

P_{max}=81.5 MWe,

	Coal	86 MWe
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P_{baseload} 86 MWe





Energy Challenges

- ✓ As for the current status of energy supply in Mongolia, about **80** percent of Mongolia's electricity generation comes from coal-fired power plants and about 10 percent from renewable energy sources.
- ✓ Heat demand, especially heating, accounts for about **60** percent of total final energy consumption, and most of the heat supply is coal-fired. Mongolia also imports about **20** percent of its domestic electricity from China and Russia.
- ✓ Therefore, how to advance the energy transition away from coal-fired heating, which accounts for more than **60** percent of total energy supply, which risks becoming energy dependent on neighboring countries, is a major challenge.

Comparing the installed capacity of domestic energy sources, it is:

- coal 82%,
- solar 8.2%,
- wind 8.1%,
- hydro 1.4%, and
- diesel 0.3%.



State Policy on Nuclear Energy

2009:

The Parliament adopted the State Policy on Exploitation of Radioactive Minerals and Peaceful Use of Nuclear Energy along with Nuclear Energy Law in 2009.

Nuclear Energy Law regulates relations connected to exploitation of radioactive minerals and nuclear energy on the territory of Mongolia for peaceful purposes, ensuring nuclear and radioactivity safety, protecting population, society and environment from negative impacts of ionized radioactivity.

2022:

To fulfill objectives reflected in the Energy Sector and State Policy, by a joint order of the Ministers of Education and Science, Energy and Mining and Heavy Industry dated August 11, 2022, the WG was assigned to study a possibility of use of the nuclear power in Mongolia.

The report of WG was introduced to the Cabinet Office and tasked the Nuclear Energy Commission (NEC) to prepare the Prefeasibility Study based on the IAEA's nuclear power infrastructure development milestones.



GOVERNMENT ACTIVITIES

❑ Amendment to the Nuclear Energy Law

- Enhancement of the nuclear safety and better regulation and coordination of the relevant bodies as well as inclusion of nuclear power elements;
- Establishment of the Nuclear Energy Agency;

❑ Establishment of a NEPIO

- Draft of NEPIO structure and ToR
- Development of a rule and planning activities in basic studies
- Submission of the proposal to the Cabinet Office

❑ Preparation of the uranium production

- Development of the infrastructure and stakeholder involvements

❑ Implementation of the worlplan of Inter-governmental Committee between Mongolia and Russian Federation

- Discussion of draft agreement on the general principle of construction of Small sized-NPP in Mongolia
- MoU between NEC and Rosatom on the construction of Center for Nuclear Science & Technology



Coordinated activities with the IAEA



- ❑ Development of a **RoadMap** for NPProgram
 - Consulting meeting was held in 2024
- ❑ Implemented the national project in 2024-2025
 - National Workshops on **NEPIO, Site Selection and Electric Grid, and MAED** were held.
- ❑ Joining of the **INPRO** project (IAEA INPRO methodology) in 2025
- ❑ National Workshop on **HRD for SMRs** in June 2026 were held.
- ❑ Implementation of the national project for 2026-2027
 - National Workshop on a **Pre-Feasibility of SMR** deployment in countries with uranium deposits in November 2026 will be held.



Actions to taken related with the workshops in Mongolia

- ❑ Mongolia is also acquiring knowledge and experience about energy planning tools, such as MESSAGE and MAED, which will greatly enhance energy projection and preparation of the pre-Feasibility Study of a SMR in Mongolia.
- ❑ Having learned the methodology required for SMR site selection, Mongolia is preparing to systematically conduct this work in terms of key criteria: Seismic & Geological Suitability, Cooling Water Availability, Population Characteristics, External Hazards, Grid Connection Potential, and Environmental Constraints.
- ❑ Also, in terms of Electric Grid study, we plan to assess the readiness of the national electrical grid to support a future nuclear power programme.





❑ We plan to do

- **Assess the potential role of SMRs in the national energy strategy.**
- **Review SMR technology options and applications.**
- **Evaluate compatibility with grid size and energy demand.**
- **Identify regulatory and safety infrastructure requirements.**
- **Assess human resource and industrial capability needs.**
- **Identify economic, financing and supply chain considerations.**

- Mongolia is currently conducting a baseline study and analyzing data to determine whether SMRs are suitable for our country. This includes preliminary studies on Rosatom's RITM-200N and GE-Hitachi's BWRX-300 technologies, their suitability for Mongolia, other applications, cooling, fuel, and power supply, human resource, and other infrastructure issues.**





SMR activity with Rosatom

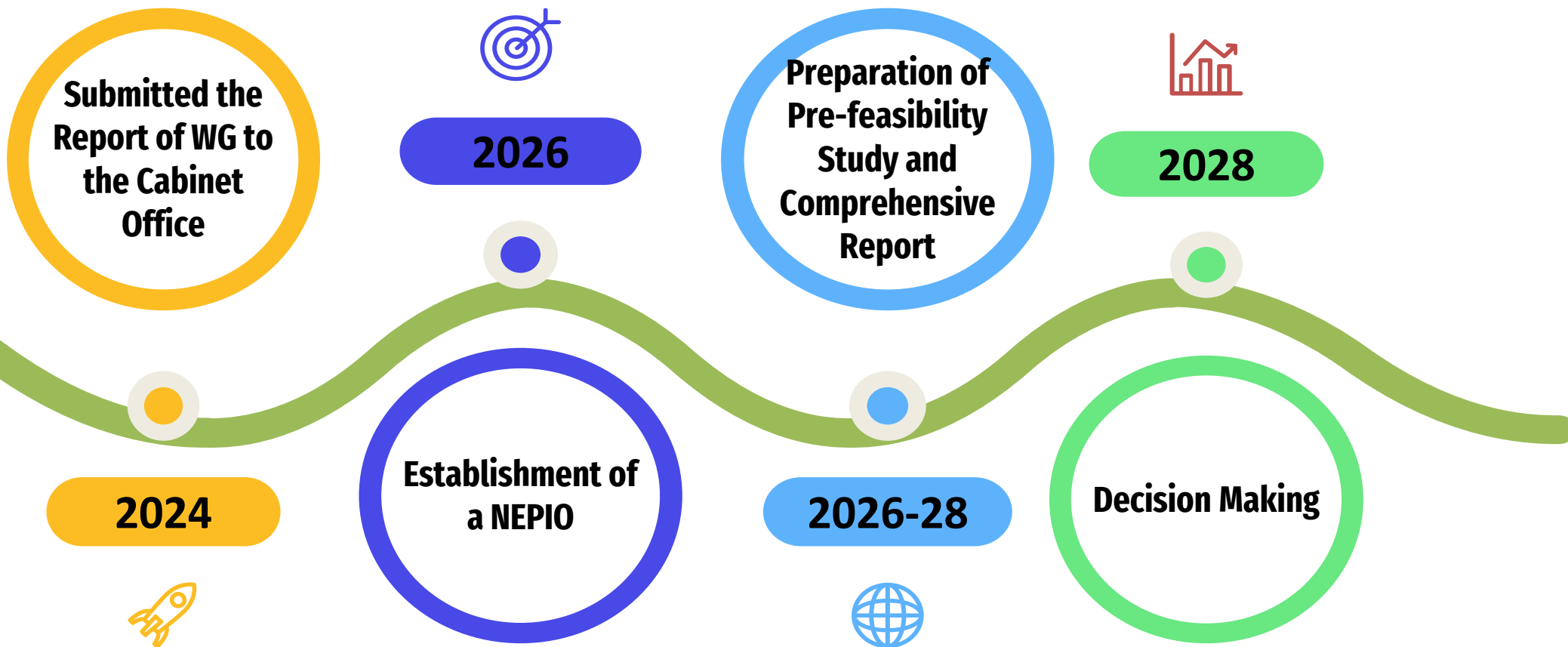
- ❑ The draft agreement “On the Basic Principles of Cooperation between the Government of the Russian Federation and the Government of Mongolia in the Construction of a SMR in the Territory of Mongolia”.
- ❑ The draft agreement aims to cooperate in the construction of a low-capacity nuclear power plant based on a pressurized water reactor design with a capacity of 220 MW in our country according to Russian designs.
- ❑ In 2024-2025, it was raised in the 26th and 27th meetings of the Mongolian-Russian Intergovernmental Commission on Trade, Economic, Scientific and Technical Cooperation.
- ❑ First technical meeting was held on 7-8 April, 2026 in Ulaanbaatar to exchange views and clarifications on the draft agreement and technical aspects.





NEPIO

ROADMAP OF PHASE 1





Consideration of Nuclear applications byound Electricity

- ✓ Major cities including the capital Ulaanbaatar city are heavily reliant on coal-fired power and households, which has led to air pollution levels exceeding normal levels in winter. Therefore, there is a need to explore technologies to neutralize emissions using nuclear technology.
- ✓ In Mongolia, mining industry occupies the largest place in national production and, in particular, accounts for the majority of export earnings. Therefore, heating and electricity as nuclear energy cogeneration systems may be an option for mining industrial sites located in remote areas.
- ✓ If we only consider electricity supply, the Southern Gobi, which has huge renewable energy potential, has the potential to produce a large amount of electricity. However, urban areas need to be heated, and it is difficult to solve the problem of directly supplying heat from renewable energy.
- ✓ It is estimated that it is possible to produce green hydrogen using high-temperature heat from electricity generated by solar and wind sources. Therefore, Mongolia should transfer from coal-based thermal power plants to green hydrogen and nuclear small modular power plants.



My expectations from the Dialogue Forum

- ✓ **I am interested to participate in assessing Mongolia's energy-mix and the role of nuclear power in it. I will participate in preparing a comprehensive report based on the nuclear energy infrastructure studies.**
- ✓ **INPRO projects and methodologies are vital for Mongolia and through my participation, I will obtain more comprehensive knowledge and understanding and will learn experience and lessons from other countries by actively contributing to the dialogue.**



Summary

- **The Government is taking necessary measures to put new energy sources into energy system to meet the increasing demands;**
- **Mongolia aims to study the possibility of use of nuclear power in its energy-mix. In this regard, the IAEA's support is vital for the country;**
- **Due to Mongolia's sparse population, vast landmass, and low energy consumption, the use of a SMR is being considered as a potential alternative to diversify energy sources and provide stable electricity and heat;**
- **The public acceptance for nuclear power is essential as the country consider to embark on nuclear power program;**
- **Strengthen international cooperation, especially with the IAEA, in the nuclear energy field.**



Thank you for your attention



E-mail: office@nea.gov.mn

Web: www.nea.gov.mn



Welcome to Mongolia

