



**21st INPRO Dialogue Forum on the Deployment of Small Modular Reactor Projects and Technologies to Support the Sustainable Development Goals, 28 August -1 September 2023, Saint Petersburg, Russian Federation**

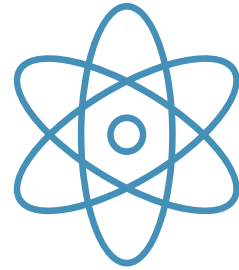


***THE NEED FOR SMR IN LESOTHO AND ROLE OF SMRS WITH VARIOUS FUNCTIONS AND FEATURES IN ACHIEVING SDGS.***

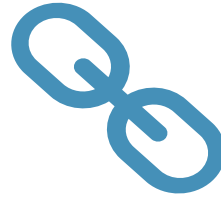
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LESOTHO



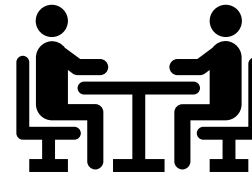
Background



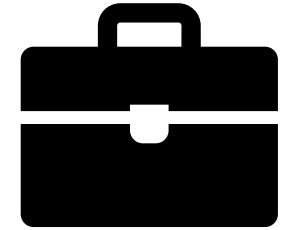
SMR



Role of SMR  
towards SDGs



Discussion



Conclusion

## PRESENTATION OUTLINE

# INTRODUCTION

- ❖ Lesotho is one of small countries that independently exist inside other countries; it is completely enclaved within the borders of South Africa. : - Area of 30, 355 square Kilometre
  - Population of about 2.2 million, 40% below poverty line, 75% of it resides in rural areas
  - The country is entirely above 1000 metres and of that, the 80% is above 1800 m above sea level
  - Diamond is the natural resource contributing immensely to the country's GDP (9%)
  - There's water project that is run in collaboration with South Africa is key to both countries.
  -

# BACKGROUND

## Energy Situation in Lesotho

- ❖ Source – Hydro power since 1998 – ‘Muela – Lesotho Electricity Company
  - Solar energy
  - Energy importing- Electricity Supply Commission (ESKOM) South Africa
  - Mozambique
- ❖ Electrification,
  - Current electrification sit at 980.62% Urban, 41% total national electrification & 10 % rural electrification.
- ❖ Energy Demand
  - High energy consumption in winter resulting into peak demand of 155 MW and Baseload of 100 MW in 2015 study.

## ❖ Recent Studies outputs

International Atomic Energy Agency model for forecasting energy demands shows that by 2023:

- At least Lesotho will reach 54.2 % electrification, however peak demand will increase to 211 MW.
- ❖ Lesotho’s ranking on Green House Gases emissions
  - 100 % green energy – 64 % hydro
    - 24 % Solar

# LESOTHO GHG EMISSIONS IN KILOTONS FROM 1990 TO 2021 BY WORLD BANK



# PURPOSE OF THE STUDY

- ❖ Review of current energy Status in Lesotho, :
  - Electrification
  - Energy Demand
  - energy Consumption
  - Deficit
- ❖ Review the Small Modular reactor designs and their role towards Sustainable Development Goals (SDGs), and whether there is a need for SMRs in Lesotho and other small developing countries to address energy challenges, challenges in other key sectors.

# SMALL MODULAR REACTORS (SMR)

- ❖ In Search of Solutions towards rising global challenges such as increasing energy consumption and demand, global greenhouse gases emissions, the concept of Small Modula Reactor (SMR) has caught the attention as a possible sustainable solution with most designs and prototypes under development.
- ❖ Significantly Reduced Sized compared to large scale commercial Nuclear Power Plants (NPPs) ~5-10%
- ❖ Power output up to 300 MW
- ❖ Ability to be factory manufactured
- ❖ Full or Partially underground and or floating
- ❖ Passive safety measures
- ❖ reduction in construction time (2-3 years) → potential to quickly spread.



# SMR ROLE TO ACHIEVING SDGS

- 3 Production of radiosopes in medical field
- 4 Availability of electricity does contribute immensely towards good education through better infrastructure
- 6 Water desalination – Agriculture and other purposes
- 7 Nuclear energy is clean - Electricity produced
- 8 Decent work and economic growth – Agric , Health, Energy and Industry

- 9 Sustainable industries through sustainable power production- good infrastructure
- 10 Access to good education and other services for all (rural and urban), bridging the gap
- 11 Sustainable cities through electrification leading to improved health and other key services
- 12 clean energy produced
- 13 Climate Action – reduced greenhouse gases emissions, other nuclear techniques applications to address climate changes in agriculture

1&2

=70% contribution



# 01

Lesotho generates ~72 MW, consumes more than that, bringing the demand to about 155 MW which is predicted to grow to about 211 MW

# 02

SMRs have potential to contribute to at least 70 % of the SDGs

# 03

It can be concluded that There is actually the need for SMRs in Les.otho and other developing countries

DISCUSSIONS AND CONCLUSION



# THANK YOU

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