16th Symposium on ICTs, Environment, Climate Change and Circular Economy

Assessing the Environmental Footprint of ICTs and AI in Africa

Dr. Abubaker Matovu Waswa

May 2026

Introduction

Energy drives economical & sustainable development

- Telecom sector heavily relies on energy for its operations
  - Renewable & non-renewable energy sources
  - Reliability / availability of energy sources is key
- Current trends
  - 1.5% – 4% contribution to global greenhouse gas (carbon) emissions
  - Digitalization enables decarbonization in other sectors

Issues

- How is ICT sector prepared for a future with carbon accountability

Challenges

- Effective / efficient use of energy for environmental sustainability

Context

Uganda is committed to sustainable development

- Digital Uganda Vision 2040
- Fourth National Development Plan (NDP IV)
- Support towards UN's Sustainable Development Goals (SDGs)

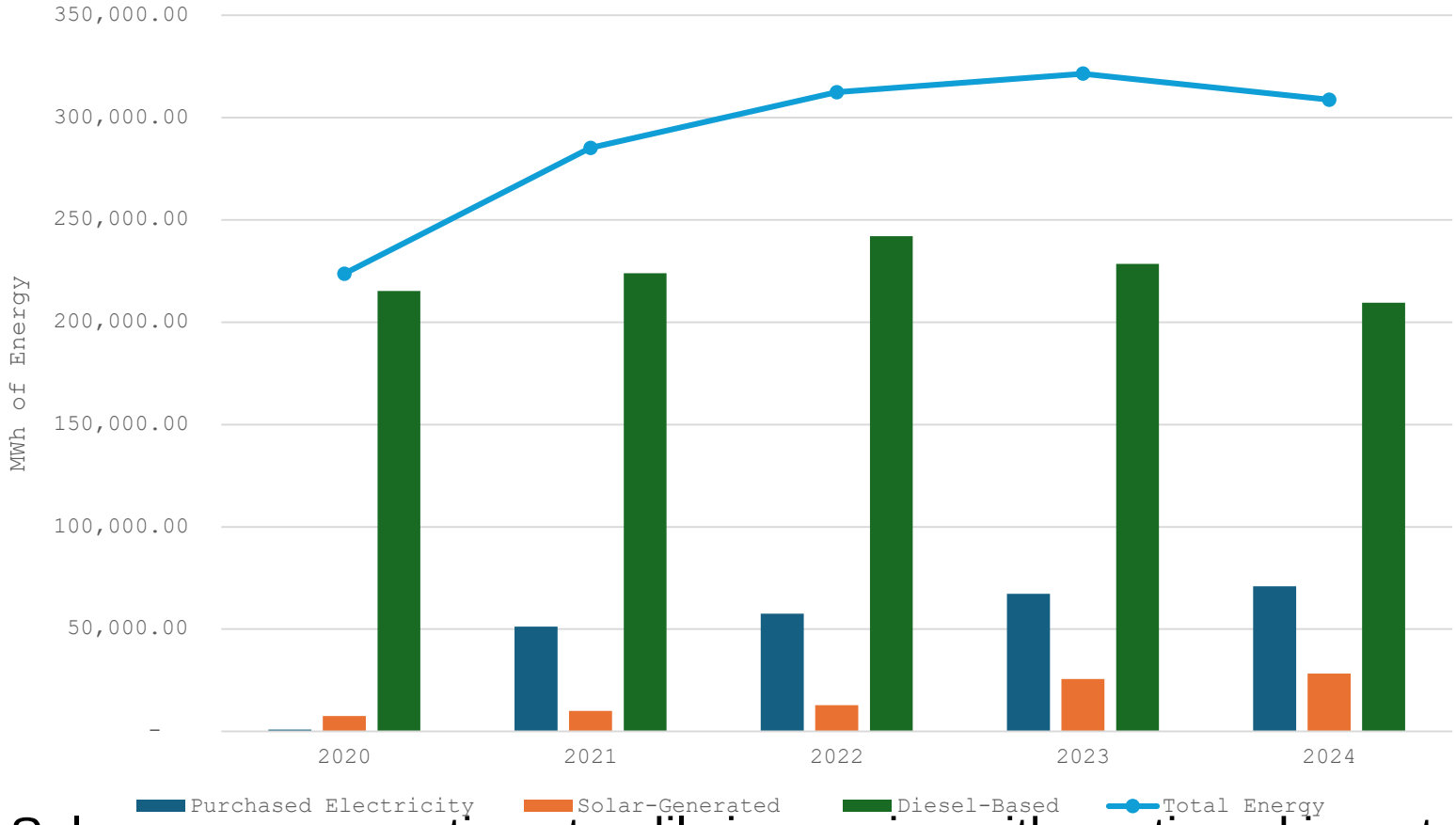
Uganda's Telecom Sector is critical pillar for NDP IV

- Supports over 45 million active subscribers
- Rapid network expansions with latest technologies
- High energy demand and limited electricity grid

Crucial to evaluate the carbon & energy footprint of the sector

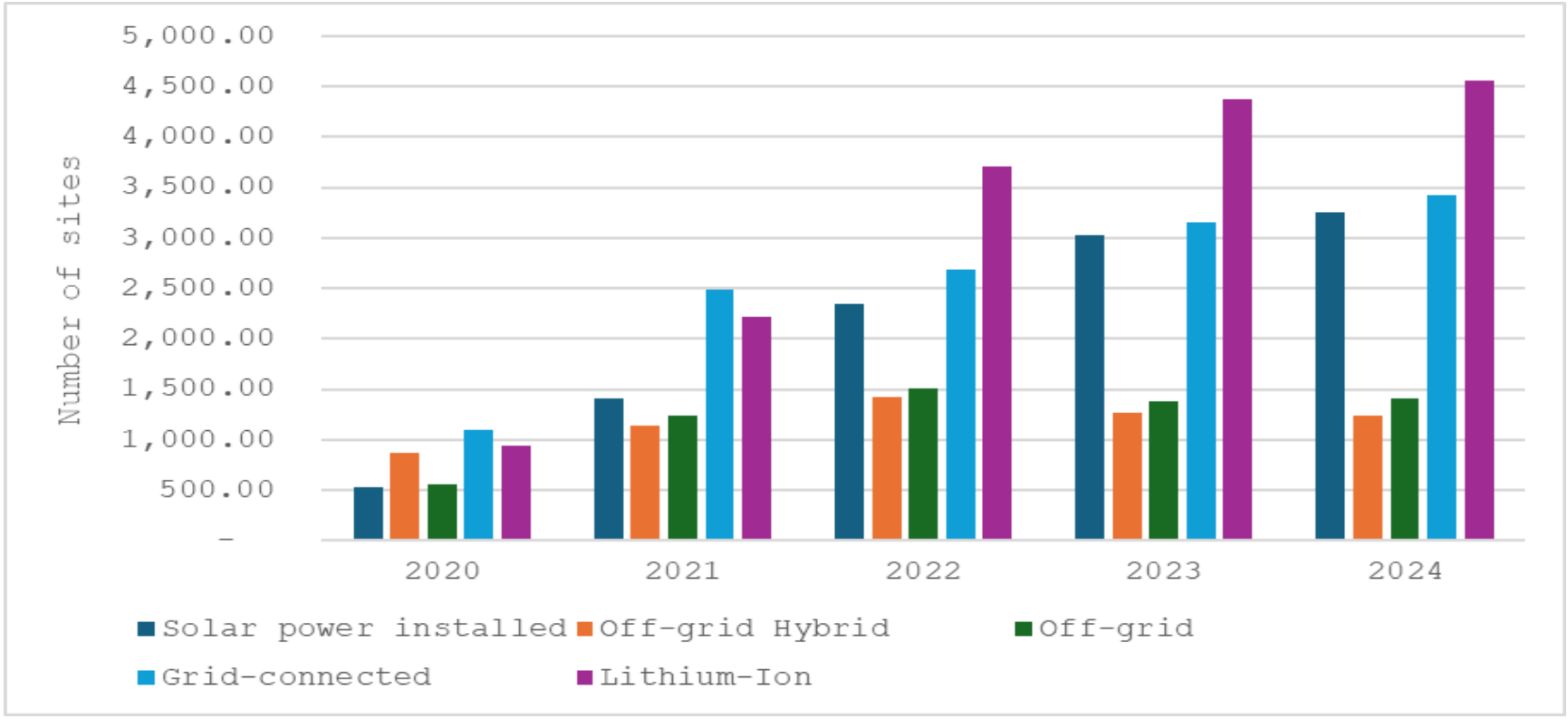
- Promote energy efficiency
- Emphasize adoption of renewable energy

Energy Generation from various Sources



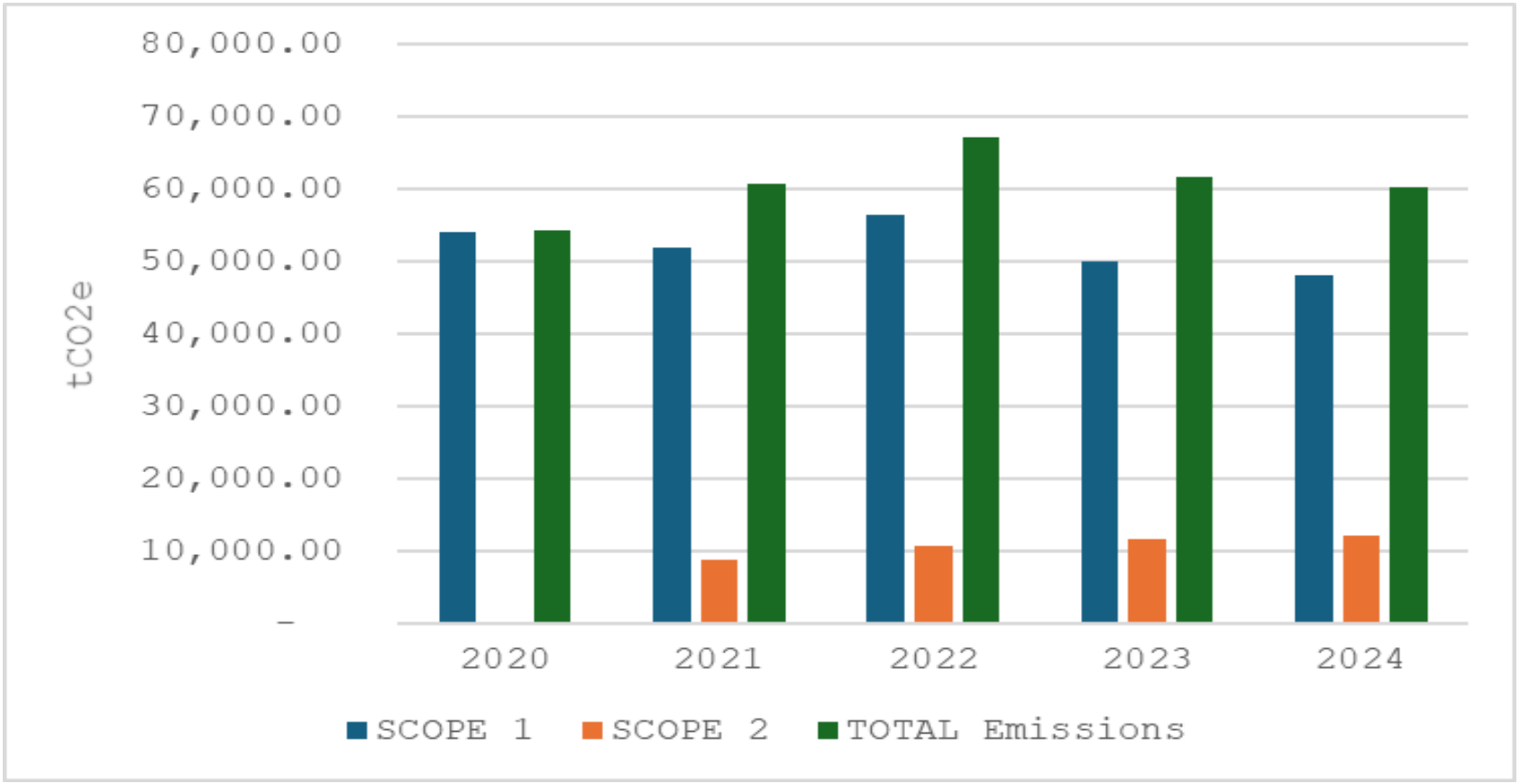
- Solar power generation steadily increasing with continued investment
- Diesel generated power accounts for largest share but with 16% decline
- Total energy demand inceases with network expansions

Energy Source Configurations



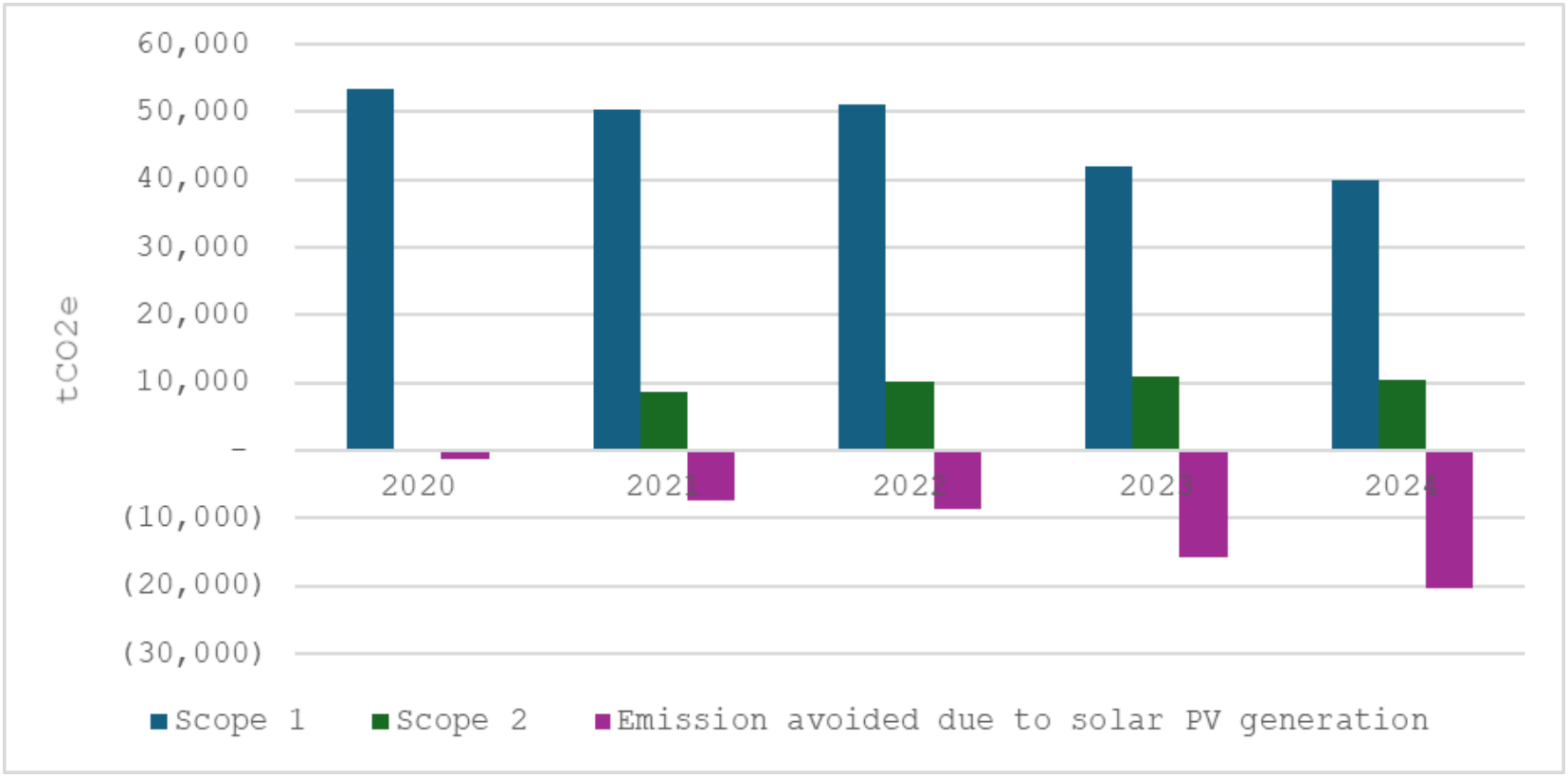
- Increase in grid connected sites and adoption of Solar PV systems
- Lithium ion battery storage systems increasingly applied
- Off-grid connections largely kept constant

Scope 1, Scope 2 & Aggregated Emissions



- Aggregated emissions peaked in 2022 and
- Increased operational efficiency and emisions managmenet in sector

Carbon Emissions avoided with Solar PVs



- Solar systems steadily compesate emissions from NPIPs
- Gradual scaling of solar / hybrid power solutions across NPIPs

Conclusions

- Energy use in ICT sector grows with network expansion
  - The growth rate is slowing and is likely to reverse in the short term (1 - 2 years)
- Carbon emissions are growing in response to energy use
  - Scope 1 emissions are declining since 2022
  - Scope 2 emissions are still rising but at a decreasing rate
  - Overall, total emissions are reducing in since 2023
- The carbon emission gains reflect deliberate sector actions
  - Increased use of solar PV, batteries and grid power
  - Diesel generation is increasingly a last resort

Key Recommendations

- Strengthen policy awareness and internal capacity
- Strengthen monitoring and reporting of energy and emissions data
- Accelerate transition to renewable and hybrid energy solutions
- Adopt efficient power equipment and practices
- Integrate carbon considerations in planning and procurement
- Establish dedicated energy and carbon management functions

Thank You