

**WORKSHOP ON UTILITY DIGITALIZATION AND PERFORMANCE
 IMPROVEMENT IN AFRICA
 12-14 February 2024
 Cape Town International Convention Centre (CTICC)
 Cape Town, South Africa
 AGENDA**

Day 1: Monday, 12 February 2024

Timing	Program	Speakers
08:00 ~ 08:30	Welcome Coffee	
08:30 ~ 08:45	Workshop Opening by World Bank	Erik Magnus Fernstrom, Practice Manager, Africa Energy Practice
08:45 ~ 09:00	Remarks by the Association of Power Utilities of Africa (APUA)	Abel Tella, Director General
09:00 ~ 09:15	Remarks by India Smart Grid Forum	
09:15 ~ 10:30	<p>Session 1: The Role of Digitalization in Grid Modernization and Utility Performance Improvement</p> <p>Expert Presentations and Q&A: This session will discuss what digitalization is, the difference with digitization, how digital technologies are at the forefront of transforming traditional electric utilities into smart, efficient, and sustainable utilities. It will highlight strategy and roadmaps for digitalization, challenges related to digitalization, its facilitators, and business cases. It will include relevant examples from utilities worldwide, as well as three specific case studies on how digitalization improves utility performance for energy transition. The session will also briefly cover the challenges posed to utilities in the integration of distributed energy resources (DER) and electric vehicles (EVs).</p> <p style="text-align: center;">Key Topics</p> <p>A. Utility Digitalization: What is Digitalization? Strategy, Building Blocks and Roadmap for Digitalization. Key Areas for Digitalization – Operational Technologies (OT) and IT. Challenges and Facilitators of Digitalization. Utility Business Case for Digitalization. Selected Utility Examples.</p> <p>Q&A (15 min)</p> <p>B. Digitalization for Energy Transition: Digitalization – an Enabler for Energy Transition, Digital Tools and Platforms for DER and EV Integration.</p> <p>Q&A (15 min)</p>	<p>Reji Kumar Pillai (25 min for A)</p> <p>Ravi Seethapathy (20 min for B)</p>
10:30 ~ 11:00	COFFEE/TEA	

11:00 ~ 12:30	<p>Case Study Session 1: Digital Transformation, Utility Performance and the Energy Transition</p> <p>Moderated and Interactive Session with Utilities</p> <p>Moderator: Ravi Seethapathy, ISGF Advisor</p> <p>Panelists:</p> <ol style="list-style-type: none"> 1. Tata Power Delhi Distribution Ltd (TPDDL), India 2. Enel, Chile 3. Eskom, South Africa 4. SENELEC, Senegal 	
12:30 ~ 13:30	<p>LUNCH</p>	
13:30 ~ 14:45	<p>Session 2: Foundational Technologies for Grid Automation and Digitalization</p> <p>Expert Presentation and Q&A: This session will cover fundamental operation technologies (OT) adopted by utilities such as SCADA, EMS, DMS, ADMS, GIS, DA/SA, AMI, WAMS, Robotics, DERMS. It will then cover Enterprise IT Systems, such as ERP, OMS, FFA, Robotic Process Automation (RPA), and others. It will finally touch upon Call Centre Automation.</p> <p style="text-align: center;">Key Topics</p> <p>A. Operational Technologies (OT): SCADA/EMS/DMS/ADMS, Geographical Information System (GIS), Distribution Automation (DA) and Sub-station Automation (SA), Advanced Metering Infrastructure (AMI), Wide Area Monitoring Systems (WAMS), Robotics, DERMS</p> <p>Q&A (10 min)</p> <p>B. Enterprise IT Systems (with implementation examples at Tata Power Delhi Distribution Ltd): Billing and Customer Care Systems, Customer Portal, Enterprise Resource Planning (ERP), Outage Management System (OMS), Asset Management System, Mobile Crew Management System, Robotic Process Automation (RPA), IT-OT Integration.</p> <p>C. Call Centre Automation: Chatbots, Voicebots, Call Log Analytics, Common Call Centre for Multiple Utilities in a City – Electricity, Water, Gas, Municipal Services etc.</p> <p>Q&A (20 min)</p>	<p>Ravi Seethapathy (20 min for A)</p> <p>Subhadip Raychaudhuri Brajanath Dey (25 min for B & C)</p>

14:45 ~ 15:45	<p>Session 3: IT Architecture, Data Management, Cloud Services and Cyber Security</p> <p>Expert Presentations and Q&As: This session will emphasize the importance of state of the art (SOTA) IT Systems with Service Oriented Architecture (SOA) that are scalable. The session will also cover the criteria for sizing and choosing appropriate cloud systems and services, data security, and management frameworks. It will focus also on cyber security issues and cyber security survey for utilities.</p> <p style="text-align: center;">Key Topics</p> <p>A. IT Architecture for Electric Utilities: IT-OT Architecture of the Evolving Net Zero Power Systems, State of the Art (SOTA) IT Architecture with Service Oriented Architecture (SOA) and Microservices, Criteria for Software Sizing and Hardware Sizing.</p> <p>B. Cloud Services: On Premise Data Centre v/s Cloud Services, Criteria for Sizing and Choosing Cloud Platforms.</p> <p>Q&A (10 min)</p> <p>C. Cyber Security: Identification of Critical Information Infrastructure (CII), Cyber Security Policy, Guidelines, Chief Information Security Officer (CISO), Types of Cyber Attacks, Security Principles - CIA Model of Security + Authentication, Cyber Security Standards for Power Systems - NIST, NERC and ISO/IEC family of standards: NERC CIP; ISO 27001, 27002, 27019, 27035; IEC:62443, IEC 62351; IS 16335, Vulnerability Assessment and Penetration Testing (VAPT), Third Party Penetration Testing, Annual Security Audit, Information Sharing and Analysis Centers (ISACs), Integrated Cyber Physical Security for Distribution Automation.</p> <p>D. Presentation of the Second Annual APUA Cyber Security Survey for Utilities</p> <p>Q&A (10 min)</p>	<p>Reji Kumar Pillai (10 min for A & B)</p> <p>Barry MacColl (20 min for C)</p> <p>Alexis Rechain (10 min for D)</p>
15:45 ~ 16:00	COFFEE/TEA	
16:00 ~ 16:45	<p>Session 4: Communication Technologies for Utility Operations</p> <p>Expert Presentation and Q&A: This session will discuss communication technology options for utilities for various IT and OT systems; and present criteria for selection of appropriate communication solutions for different utility applications.</p> <p style="text-align: center;">Key Topics</p> <p>A. Communication Technology Options for Electric Utilities: Wired Communication Solutions, Wireless Communication Solutions, Pros and Cons of Different Communication Solutions, Private Communication Network (PCN), Key Drivers and Lifecycle Costs.</p> <p>B. Implementation Experiences in Select Utilities.</p> <p>Q&A (15 min)</p>	<p>Barry MacColl (30 min for A & B)</p>
16:45 ~ 17:45	<p>Case Study 2: Utilities Modernization Experience in SSA</p> <p>Moderated and Interactive Session with Utilities from Sub-Saharan Africa (SSA)</p> <p>Moderator: Abel Tella, Director General, APUA</p> <p>Panelists:</p> <ol style="list-style-type: none"> 1. Kenya Power, Kenya 2. Umeme, Uganda 3. CIE (GS2E), Cote d'Ivoire 4. 	

Day 2: Tuesday, 13 February 2024

Timing	Program	Speakers
8:00 ~ 08:30	Coffee and Recap of First Day	
8:30 ~ 09:15	<p>Session 5: Utility Performance Landscape in Sub-Saharan Africa</p> <p>Expert Presentation and Q&A: The session will cover how the use of digital technologies can help to optimize service to customers and improve efficiency, transparency, and accountability in operations in key business areas of an electric utility (electricity supply, commercial functions, management of corporate resources, etc.). Analysis of options to optimize execution of processes and activities (P&A) in each business area with the support of digital technologies.</p> <p>Q&A (15 min)</p>	<p>Pedro Antman (30 min)</p>
09:15 ~ 10:45	<p>Session 6: Smart Metering</p> <p>Expert Presentations and Q&As: The session will cover in detail the Smart Metering or Advanced Metering Infrastructure (AMI) which is the essential step towards digitalization of utilities. Besides energy accounting and loss identification, the AMI data can be analyzed with advanced digital tools to help accurate demand forecasting in different time intervals in a day/week/season that will help reducing power purchase cost; optimize network assets and operations, faster outage detection and service restoration, remote operations; accurate measurement of reliability indices; and power quality measurement and management. The session will present smart metering implemented at Tata Power Delhi Distribution Ltd, as well as AMI deployment at Eskom.</p> <p align="center">Key Topics</p> <p>A. Advanced Metering Infrastructure (AMI): Introduction to AMI system, Key Components of AMI system – Smart Meters, 2-Way Communication Solution, Head End System (HES), Meter Data Management System (MDMS), AMI Architecture and System Integration (SI), Prepaid Smart Meters – Example from India on the 250 million smart prepaid meter rollout, Analytical Tools and Customized Dashboards.</p> <p>Q&A (10 min)</p> <p>B. Benefits of AMI to Different Stakeholders: Distribution Utility, Transmission and Generation Utility, Customers; and Society.</p> <p>C. AMI 2.0: Smart Meter Operations Centre (SMOC), Advanced Applications and Analytics, Smart City Applications, Next Generation Metering – Distributed Intelligence.</p> <p>D. AMI Deployment at Eskom</p> <p>Q&A (15 min)</p>	<p>Subhadip Raychaudhuri (40 min for A)</p> <p>Reji Kumar Pillai (15 min for B & C)</p> <p>Edison Makwarela (15 min for D)</p>
10:45 ~ 11:00	COFFEE/TEA	

11:00 ~ 12:30	<p>Session 7: DER Management and Prosumer Enablement</p> <p>Expert Presentations and Q&As: This session will primarily discuss the impact of distributed energy resources (DER) on the grid and the solutions for DER integration with grid such as battery energy storage systems (BESS), demand response (DR) and other digital tools and platforms. The session will also cover consumer/prosumer engagement in management of DERs which include demand side interventions which is facilitated through digitalization as well as how digitalization empowers consumers with real-time data on their energy consumption, enabling them to make informed choices and reduce energy bills; and prosumer – utility engagement models. The speakers will present examples of successful projects and pilot demonstrations.</p> <p style="text-align: center;">Key Topics</p> <p>A. Distributed Energy Resources (DER) and its Impact on the Grid: Technical Challenges and Solutions for DER Integration, Behind the Meter (BTM) Resources – Battery Energy Storage Systems (BESS), and Distributed Solar PV, Impact of Prosumer Growth on Utility’s Technical and Financial Operations, Challenges Related to Grid Management, Revenue, and Load Balancing, Strategies for Adapting the Grid Stability and Maintaining Financial Viability.</p> <p>Q&A (10 min)</p> <p>B. Prosumer Engagement Strategies and Case Studies: Innovative Strategies for Utilities to Engage with Prosumers Effectively, International Case Studies Showcasing Successful Prosumer Enablement and Integration Programs and Sustainability Initiatives, Time of Use Tariff (ToU) and Demand Response (DR).</p> <p>C. Business Models: Business Models for Promoting BTM Resources – Rooftop PV, ESS, EVs, Heat Pumps, Business Models for DR, Business Models for EV-Grid Integration.</p> <p>Q&A (10 min)</p>	<p>Ravi Seethapathy (40 min for A)</p> <p>Reena Suri (15 min for B)</p> <p>Reji Kumar Pillai (15 min for C)</p>
12:30 ~ 14:30	LUNCH	
14:30 ~ 18:00	<p>Site Visit to Eskom’s Smart Embedded PV with Battery Storage Microgrid Pilot Project at Lyndoch</p> <p>Lyndoch is a small community located on the outskirts of Stellenbosch and has a diverse mix of sustainable and environmentally friendly building styles and living. In 2017 Eskom added to this sustainability by piloting Rooftop PV with battery storage including smart metering to this community. This demonstration project, co-owned by Eskom and the community, empowered community members to assume active roles in the development, installation, maintenance, and ownership of the energy system. Through this and other sites, Eskom is testing microgrids as a solution to supplying green power where there are constrained networks, in rural and remote areas, to improve reliability, or as an alternative to avoid costly infrastructure.</p>	<p>Nick Singh</p>
18:30 ~ 20:30	NETWORKING RECEPTION	

Day 3: Wednesday, 14 February 2024

Timing	Program	Speakers
08:30 ~ 09:00	Coffee and Recap of First and Second Days	
09:00 ~ 10:00	<p>Case Study 3: Strategic Approaches on Data Driven Transformation of Utilities and Selected Case Studies</p> <p>Expert Presentation and Q&A: The session will cover components of data-driven transformation, benefits and challenges, role of digitalization in addressing the real-life challenges of utilities; guiding principles for data-driven roadmaps, and utility case study from Turkey.</p> <p>Q&A (15 min)</p>	<p align="center">Gökhan Tosun (45 min)</p>
10:00 ~ 10:30	COFFEE/TEA	
10:30 ~ 11:30	<p>Session 8: Roadmaps and Implementation Strategies</p> <p>Expert Presentations and Q&A: The session will discuss the long-term corporate plan, smart grid roadmap, digitalization roadmap and IT roadmap etc. The session will also cover Smart Grid Maturity Model (SGMM), as well as a presentation of the Smart Grid Roadmap of City of Cape Town.</p> <p align="center">Key Topics</p> <p>A. Roadmaps and Implementation Strategies: Long-term Corporate Plan (15-20 Yrs) and Short-term Business Plan (5 Yrs), Smart Grid Maturity Model (SGMM), Smart Grid Roadmap, IT Roadmap, Digitalization Roadmap, Energy Transition and Decarbonization Roadmap, Project Implementation Strategies, Toolkit for Cost Benefit Analysis, Customer Engagement Programs, Policy Level Support for Long-Term Roadmaps, Annual Review and Update of Roadmaps</p> <p>B. Presentation of the Smart Grid Roadmap of City of Cape Town</p> <p>Q&A (15 min)</p>	<p align="center">Gokhan Tosun (20 min for A)</p> <p align="center">Rebecca Cameron and Gerhard Brown (25 min for B)</p>
11:30 ~ 13:00	<p>Session 9: Emerging Technologies and Use Cases</p> <p>Expert Presentations and Q&As: This session will examine the impact of fast paced growth of electric vehicles (EVs) for electric utilities, as well as the new technologies such as Artificial Intelligence (AI), Machine Learning (ML), Data Science and Advanced Analytics and its successful use cases in utilities and the implementation challenges.</p> <p align="center">Key Topics</p> <p>A. Electric Mobility and AI/ML: Electric Mobility and its Impact for Electric Utilities - Charging Infrastructure, Fleet Electrification, Battery Swapping Stations, Bus Electrification; Artificial Intelligence (AI) and Machine Learning (ML) Applications and Advanced Analytics for Utilities.</p> <p>Q&A (15 min)</p> <p>B. Deployment of AI/ML Applications in Eskom</p> <p>Q&A (15 min)</p>	<p align="center">Reji Kumar Pillai (45 min for A)</p> <p align="center">Renier van Rooyen (15 min for B)</p>
13:00 ~ 14:00	LUNCH	

14:00 ~ 15:00	<p>Session 10: Business Models</p> <p>Expert Presentations and Q&As: This session will explore innovative business models to implement new technologies that reduce the risk of utilities and help them maintain the digital systems at minimal cost. The session will also cover frameworks to conduct successful pilots/demonstration projects; and models for scaling up the pilot projects.</p> <p style="text-align: center;">Key Topics</p> <p>A. Development of Business Cases: Project Benefits and ROI on the Capex Investments, Inhouse Maintenance v/s Outsourced Maintenance, Opex or Services Model (XaaS), Totex Model, Regulations Supporting Innovative Business Models – Regulatory Sand Box Approach, Case Study of the AMI Rollout in India on Totex Model, Case Studies of the AMI - Business Models (ENEL/EPRI).</p> <p>Q&A (10 min)</p>	<p style="text-align: center;">Reji Kumar Pillai (20 min)</p> <p style="text-align: center;">Gokhan Tosun (20 mins)</p> <p style="text-align: center;">Nick Singh, ESKOM (10 min)</p>
15:00 ~ 16:00	<p>Case Study 4: Case Study on Utility Digitalization Journey</p> <p>Presentation by Rodrigo Maldonado, ENEL Chile</p>	
16:00 ~ 16:30	<p>COFFEE/TEA</p>	
16:30 ~ 17:30	<p>Session 11: Training and Capacity Building in Utilities and Industry</p> <p>Moderated Panel with Short Presentations and Q&A: This session will cover the key factors that would determine the success of digitalization in a utility including the capability of its employees in understanding the nuances of the new technologies and their willingness to adapt to the digital era. Establishment of Centre of Excellence (CoE) for new technologies in a utility/country/ region can significantly contribute to the pace and success of such transformation. It is also important to work towards gender balance and women’s inclusion in employment opportunities in utilities.</p> <p>Moderator: Barbara Ungari, World Bank</p> <p>Panelists:</p> <ol style="list-style-type: none"> 1. Reena Suri, ISGF 2. Subhadip Raychaudhuri, TPDDL 3. Abel Tella, APUA 4. Nick Singh, Eskom <p style="text-align: center;">Key Topics</p> <p>A. Training and Capacity building: Policies for Training and Capacity Building, Training Manuals, Change Management, Inhouse Training Programs v/s External Training Programs, Online Training Courses, Collaboration with Academia and Research, Regulatory Support for Mandating Training and Capacity Building as Key Component of New Projects; Training Centers and Programs, Centers of Excellence (CoE) and Smart Grid Laboratory.</p> <p>B. Importance of Gender Balance and women’s inclusion in employment opportunities.</p>	