International Panel
Smart Energy Systems

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Ambassador Americas, Global Smart Energy Federation (GSEF)
Executive Chairman, Biosirus Inc.

About GSEF

Global Smart Energy Federation

ACCELERATING
SMART ENERGY SYSTEMS
AROUND THE GLOBE

Global Think Tank
Advocacy
Joint Projects
Shared Experts

www.globalsmartenergy.org

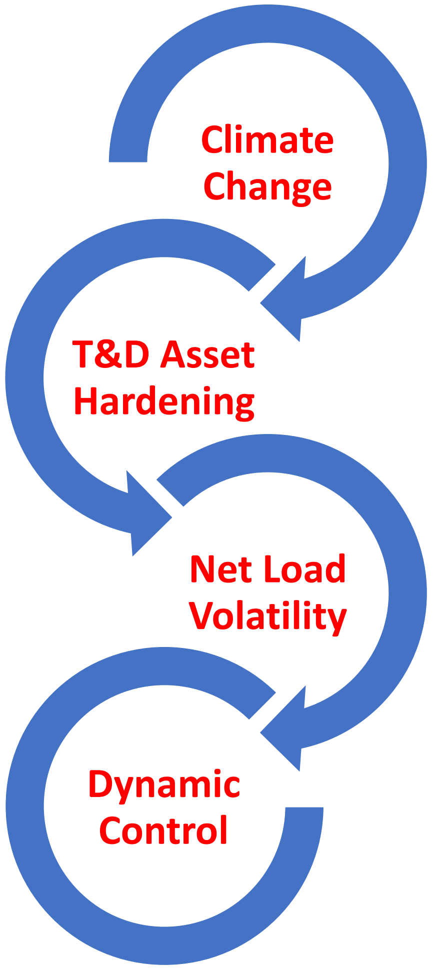
Members

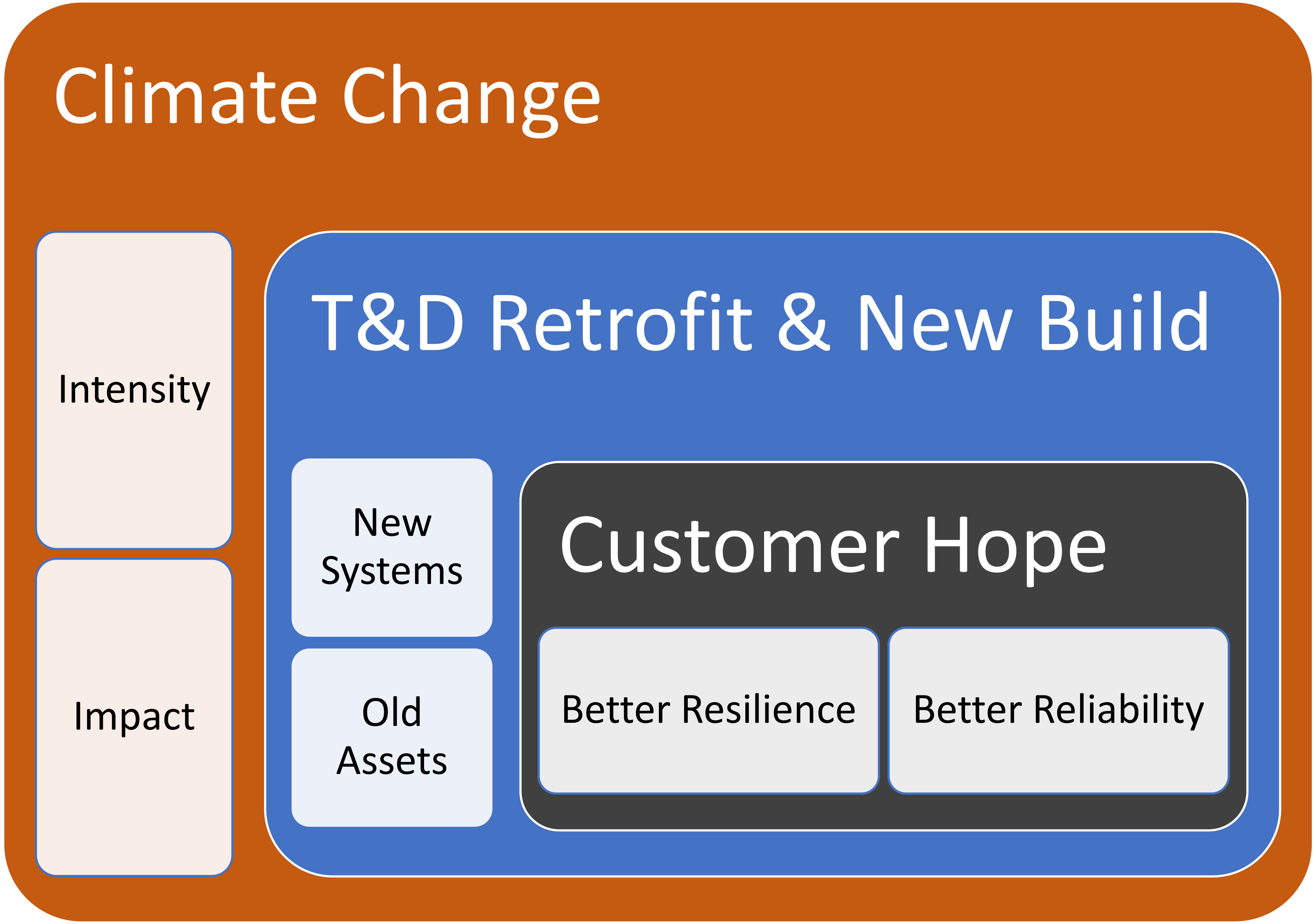
- Think Smart Grids
- India Smart Grid Forum
- Korea Smart Grid Association (KSGA)
- Prakarsa Jaringan Cerdas Indonesia (PJCI)
- Smart Grid Ireland
- Electricity Generating Authority of Thailand (EGAT)
- Electricity Supply Commission of South Africa (ESKOM)
- Tenaga Nasional Berhad (TNB)Malaysia
- European Distribution System Operators (E.DSO)
- Botswana Power Corporation
- Green Business Certification Inc.
- Florence School of Regulation (FSR)
- Electric Power Research Institute
- Texas State University
- Arab Renewable Energy Commission
- Association of Power Utilities of Africa

Session Questions

- Global Transformation of Electrical Services
- Best Practices - Ensuring High Reliability & Resiliency
- Data Driven Service Models
- Implications for Value Creation

Context


Climate Change
T&D Asset Hardening
Net Load Volatility
Dynamic Control


Climate Change
Intensity
Impact
T&D Retrofit & New Build
New Systems
Old Assets
Customer Hope
Better Resilience
Better Reliability

1. Reduce Weather Impact on T&D Assets

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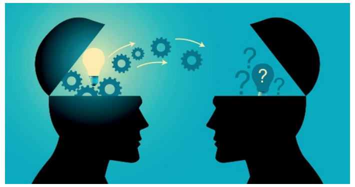
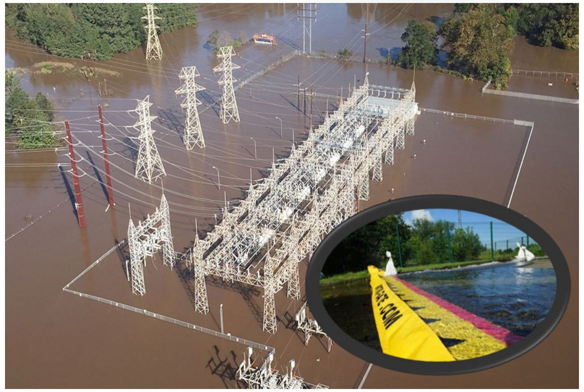


Flood



Wind/Ice

Ambient Temp.

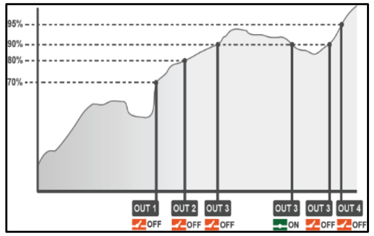
Wildfire

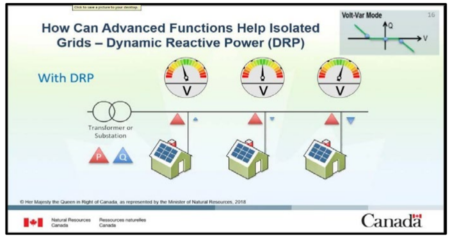
2. Grid Flexibility = Load Flexibility + Supply Flexibility

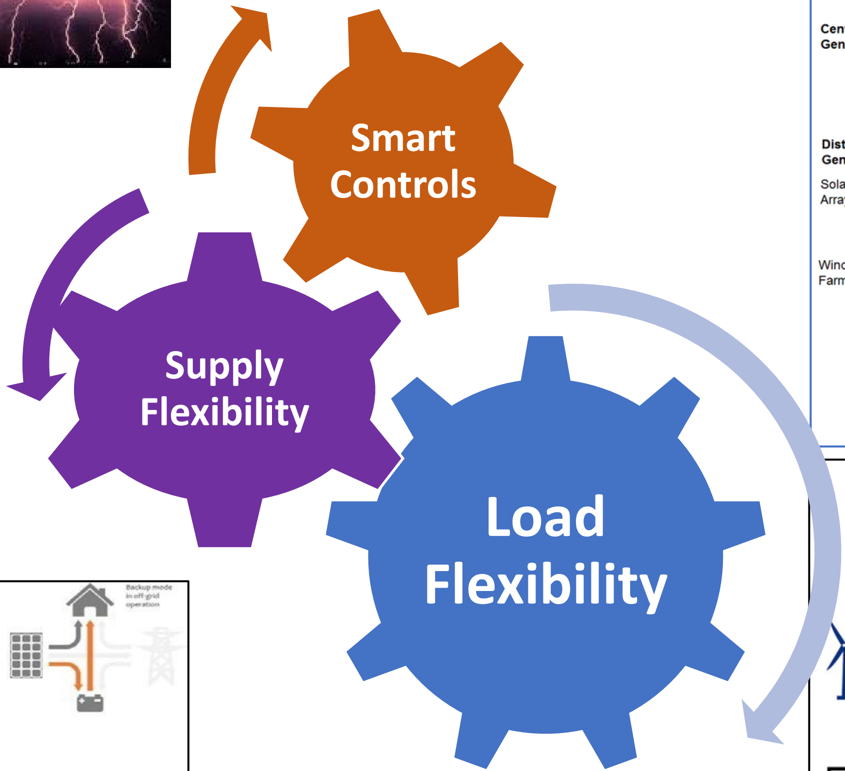
Situational Awareness (Beyond Grid)



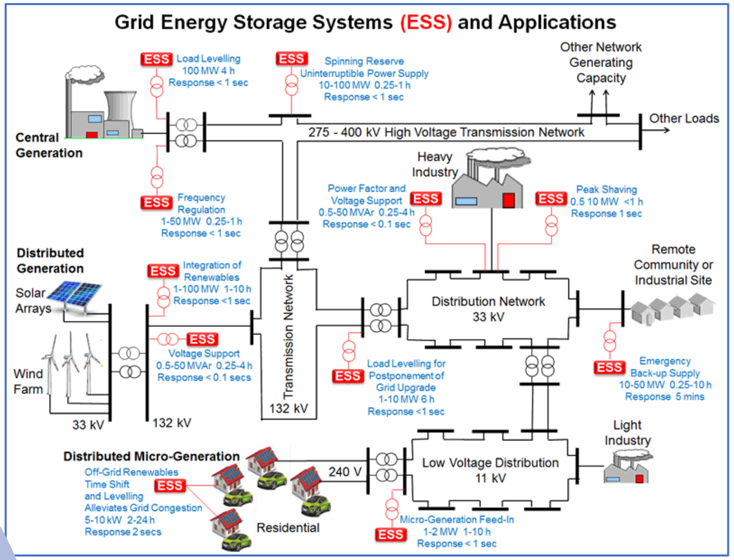

Adaptive – Autonomous Load & VAR Control

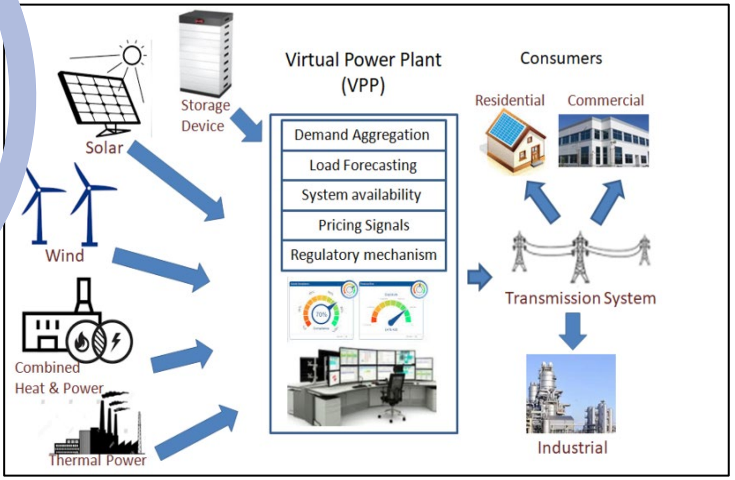




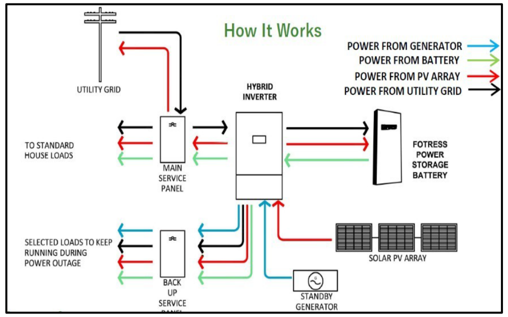


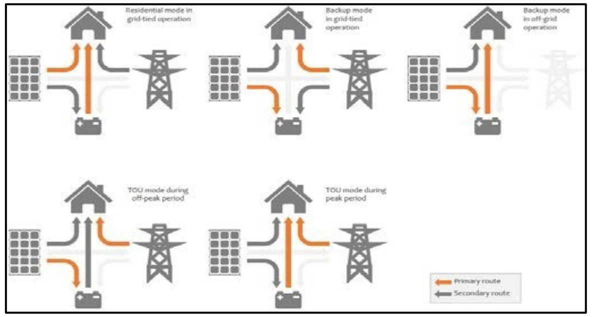
Distributed Energy Resources & Management



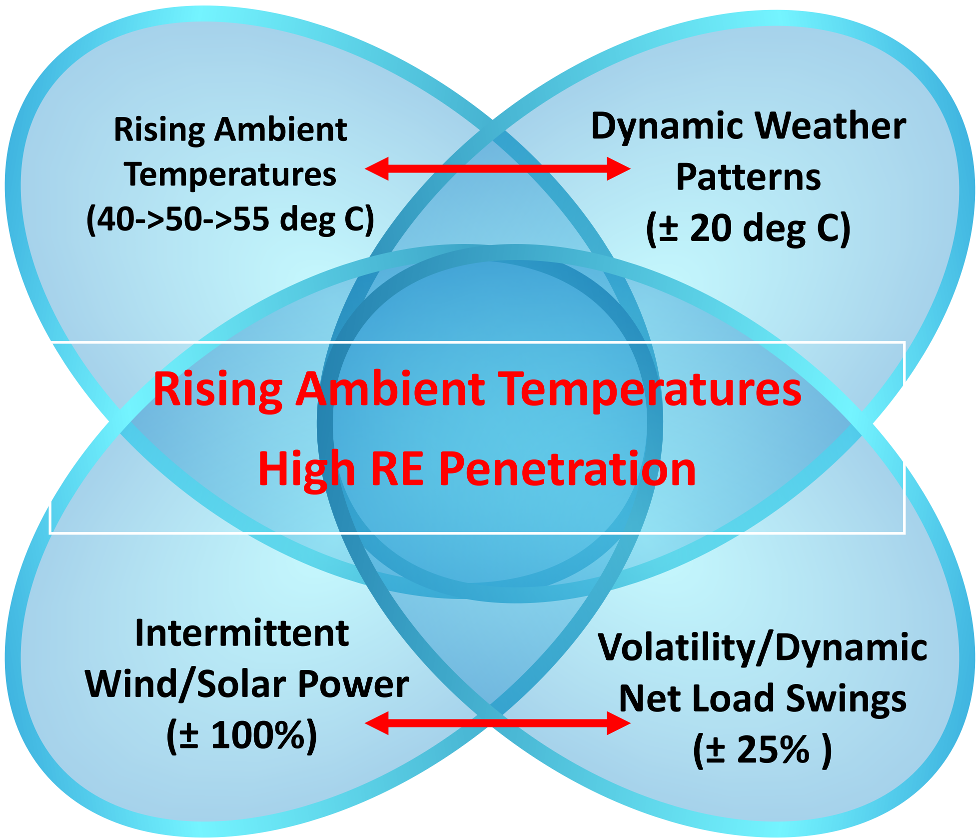


Customer Load Flexibility





3. Real-time Thermal Management of Assets



Ambient Adjusted Rating

Dynamic Rating

Status Quo – Asset Temperature

- Loading and Asset Δ-temp. Limit
- Ambient Temp.

↓

Forecasted 4-Hour Load

- New Loading
- Forecasted Ambient Temp.

↓

Asset Capability to take New Load (Yes/No)

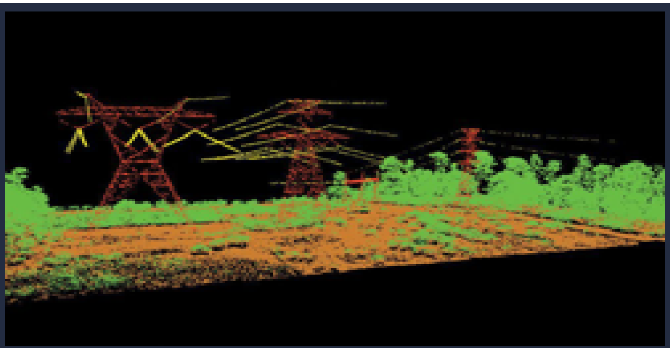
- Projected Asset Δ-Temp. Rise
- New Δ-Temp. Thermal Limit

Ambient Temp. + Internal Temp. + 4-hour Load Forecast + Ramp Rate + 4-hour Ambient Temp. Forecast = Asset Capability to meet load

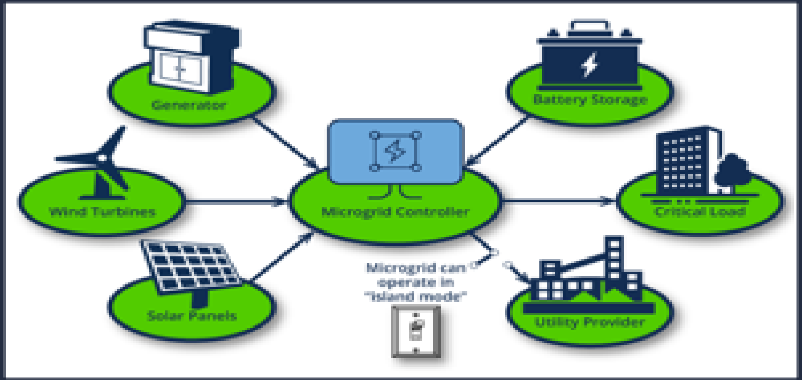
5. Leverage Generative AI Applications

Using images, text, audio, video, patterns, 3D models and structures from existing data to make predictions and analysis

Satellite Imagery and/or flight Lidar analysis for Tx & Dx line condition & monitoring

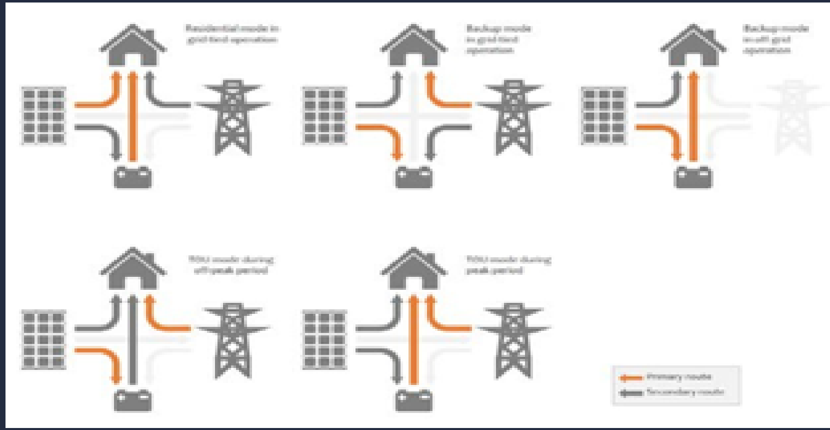


Grid forming Microgrids using wider area stability performance



Area load optimization with residential DC hybrid inverters - Solar PV, BESS

EV Charging, Power Quality, VAR support Energy storage



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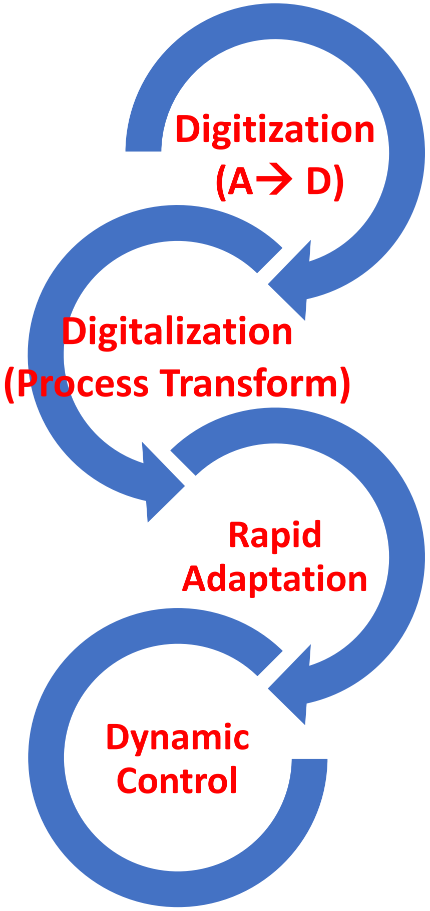
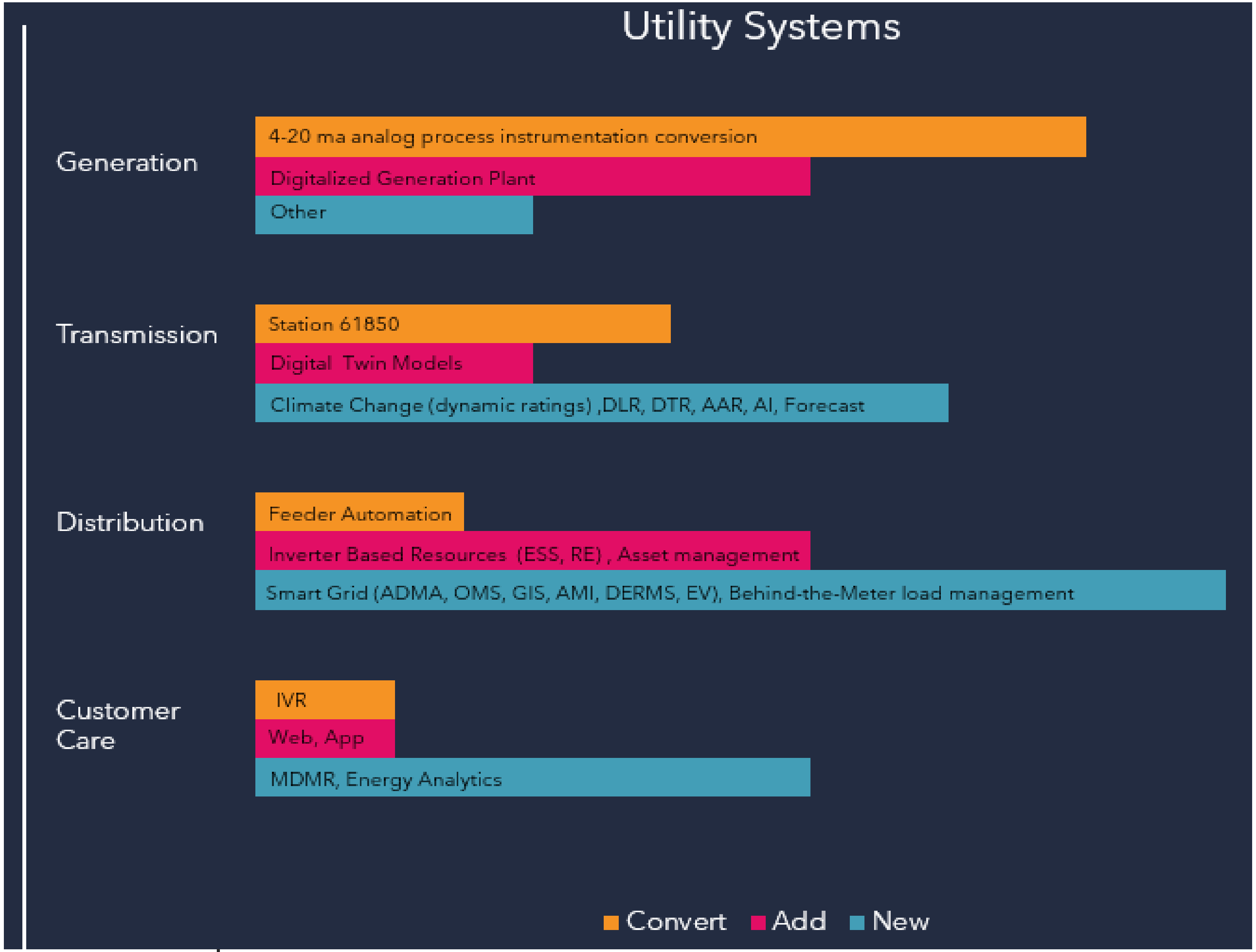
Implications for Value Creation





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THANK YOU

Brief CV

Ravi Seethapathy

Life Fellow, Canadian Academy of Engineering Life Senior Member, IEEE
Professional Engineer, Ontario B.Tech (Hons), M.Eng, MBA ravi.seethapathy@gmail.com

Ravi Seethapathy, serves as the Executive Chairman of Biosirus Inc., Canada and also serves as the "Ambassador for the Americas", for the Global Smart Energy Federation; as Technical Expert, for the Coalition for Disaster Resilient Infrastructure (CDRI); as an Advisor to the India Smart Grid Forum (ISGF) and the India Energy Storage Alliance (IESA). He is an Expert Advisor to the Utilities/Industry in the Energy and Power Systems area with over 35+ years of experience.

His contributions in the Canadian utility sector includes Systems Innovation & Advanced Grid Development at Hydro One Networks, Canada. At Hydro One Networks, he led the power systems technical architecture of its RD&D Programs (2009-2014); Advanced Grid (Smart Grid) Pilot Project (2009-2011), the Corporate Smart Grid Strategy Taskforce (2008) and from 2006 the initial efforts in the integration of DER in the Hydro One Distribution System. His 29+ years of experience at Hydro One/Ontario Hydro has been in almost all fields of electric utility business and he has progressively held leading positions in Protection & Control, Field Operations, Hydraulic Generation and Transmission Operations, Generation Performance, Distribution Strategy/Planning, Mergers & Acquisition, Corporate Audit, Asset Management and Asset Strategies Divisions and most recently in Corporate Research.

His current/past international technical activities include (1) Canada Expert Member, (a) IEC SEG 13 "Electrical Equipment Under Extreme Climate, Environmental and Disaster Conditions"; (b) IEC SEG 12 "Bio-digital Convergence"; (c) IEC SEG 11 "Future Sustainable Transportation"; (2) CSA/IEC TC 120 - Energy Storage; (3) CSA SysC LVDC Committee; and (4) Chair, India Smart Grid Forum WG 5 (Renewables & Microgrid). He is an invited speaker in the international Smart Energy /Infrastructure /Mobility areas, having co-authored over 50 technical papers.

is prior professional engagements include Advisory Council of EPRI's Power Delivery and Utilization Division (2010-2014); Governing Council, Energy Research Initiative, Semi-Conductor Research Corporation (2012-2014); CEATI's Smart Grid Taskforce (2012-2014) and SOIG WG (2009-2011); Corporate Directorships at Larson & Toubro's Power Transmission & Distribution IC (2018-2024); Smart Grid Canada (2012-2019), India Smart Grid Forum (2015-2018), Toronto Atmospheric Fund (2015-2017), Ryerson University (2007-2010), TV Ontario (2001-2007), Scarborough Hospital (2002-2004) and as Chair of Engineers Without Borders (2000-2006), Canadian Club of Toronto (2003-2004) and President Indo-Canada Chamber of Commerce (1998-2000).

He is a Senior Life Member of the IEEE; a Life Fellow of the Canadian Academy of Engineering; and a registered Professional Engineer in Ontario. He actively lectures at Conferences, Utilities, Universities and mentors small technology companies. He was honoured with the Distinguished Alumnus Award (2025) by IIT Kharagpur, India, ISGF President's Award (2023), IEEE Life Member Service Award (2021) and Queen Elizabeth II Diamond Jubilee Medal in 2012, among other numerous citations and awards. He holds a B.Tech (Hons) in Electrical Power from IIT Kharagpur, India, an M. Eng in Electrical Power from University of Toronto and an MBA from the Schulich School of Business, York University, Toronto. He/ family have endowed an IEEE Award in "Rural Electrification Excellence".