

PART B: Digitalization for Energy Transition

Session Content

- Digitalization – an Enabler for Energy Transition
- Digital Tools and Platforms for DER and EV Integration

Speaker:

Ravi Seethapathy

- Advisor - ISGF and GSEF
- Executive Chairman, Biosirus, Canada

Digitization and Digitalization

Digitization

The act of converting analog information into digital forms

- Example:
 - Scanning paper documents for easy storage, access and edits for improved productivity
 - Archiving old customer records
 - Scanning old station drawings

Digitization is the first step towards digital transformation

Digitalization

The act of transforming existing processes using digital technology

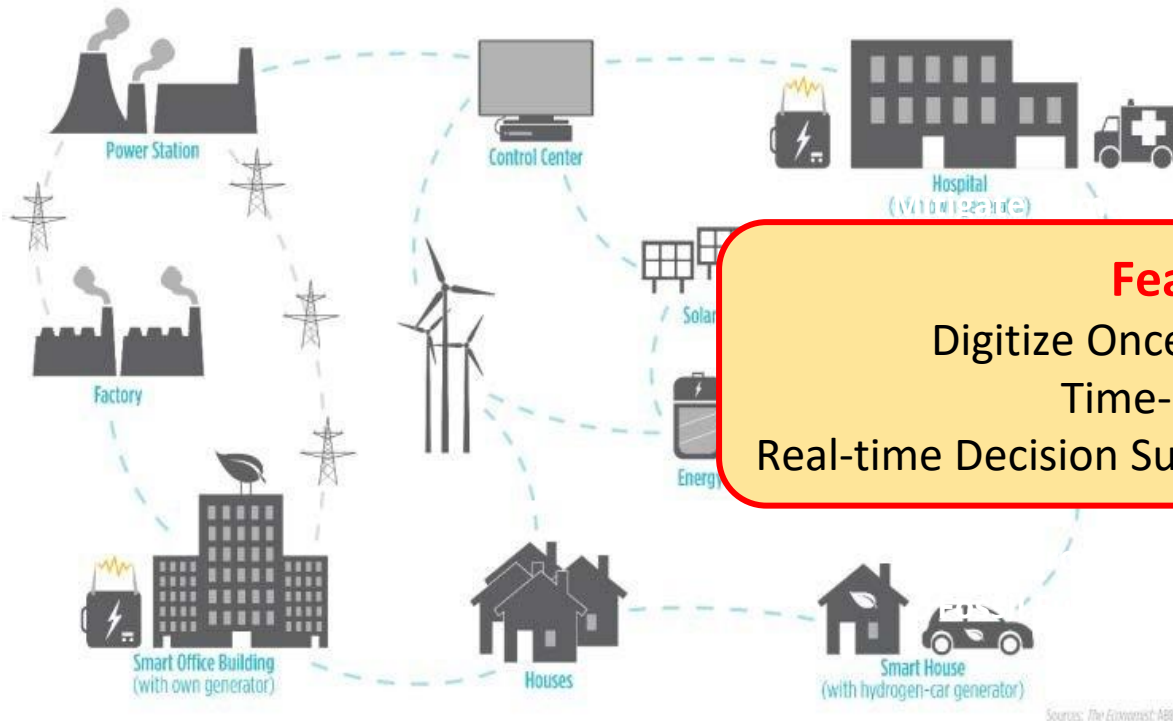
- Example:
 - Replacing physical meter reading and billing process into an AMI platform
 - Mobile Workforce Management
 - GIS Asset Base

Digital platforms can be updated or modified easily to meet changing market & regulatory conditions

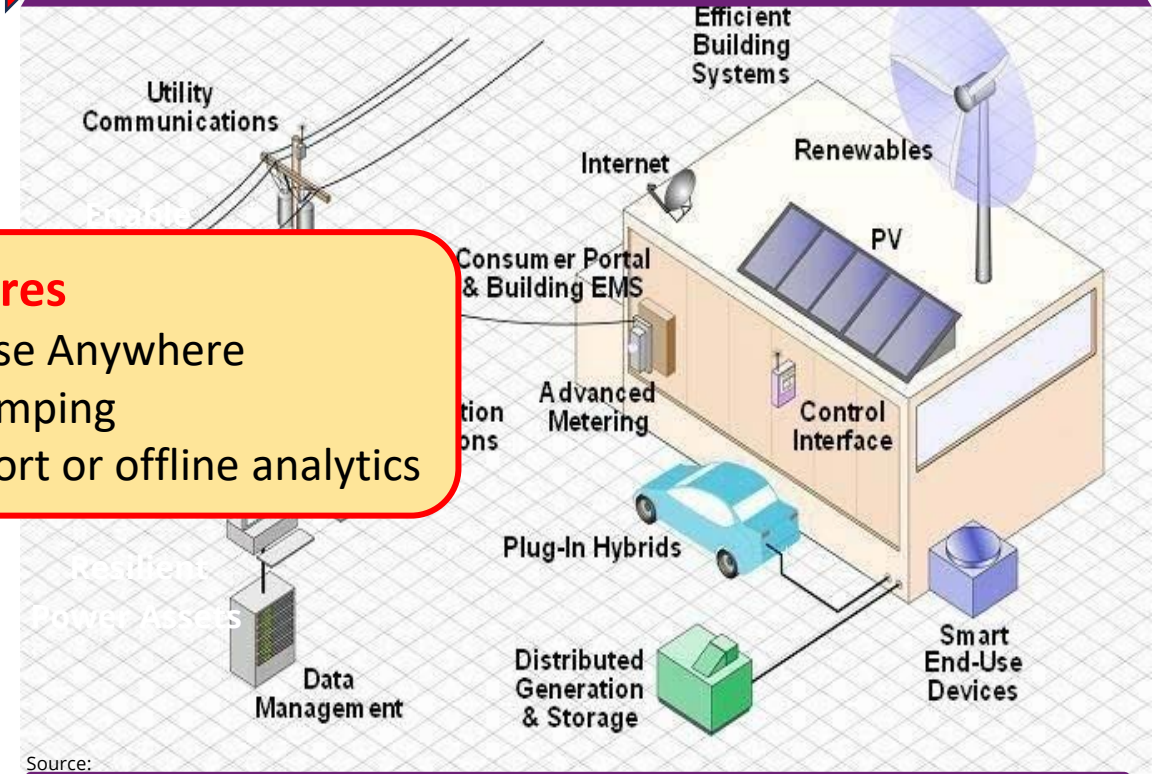
Digitalization as an Enabler of Energy Transition

Utility of the Future
Decarbonization - Decentralization - Digitalization

Technology Interactions With Grid Elements



Features
Digitize Once Use Anywhere
Time-stamping
Real-time Decision Support or offline analytics



Maximum Asset Utilization
Reliability - Climate Resilience - Easy Restoration

Maximum Asset Interaction
Connectivity - Scalability - Automation

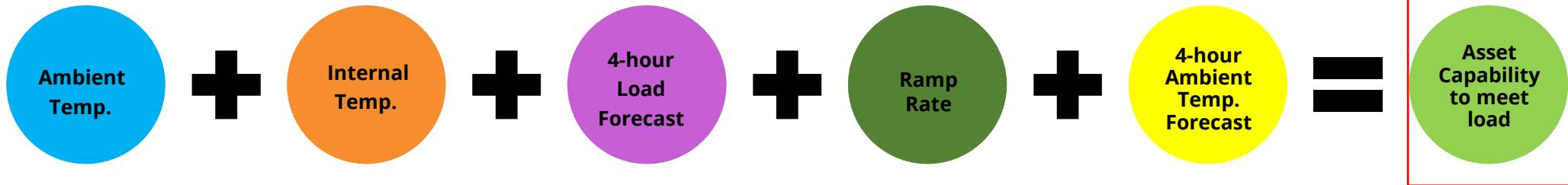
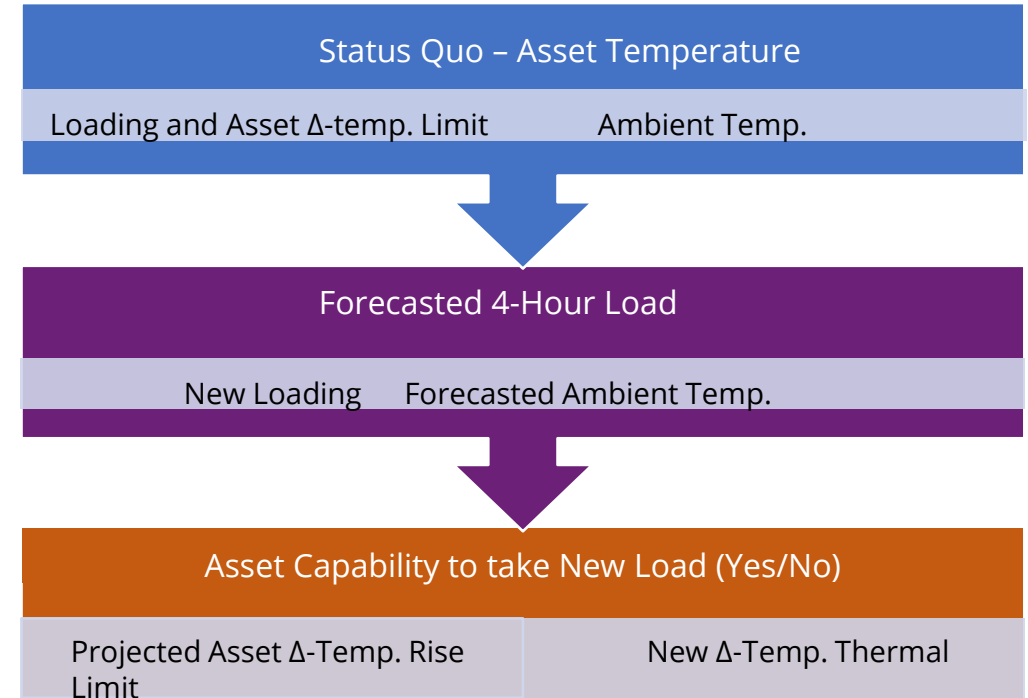
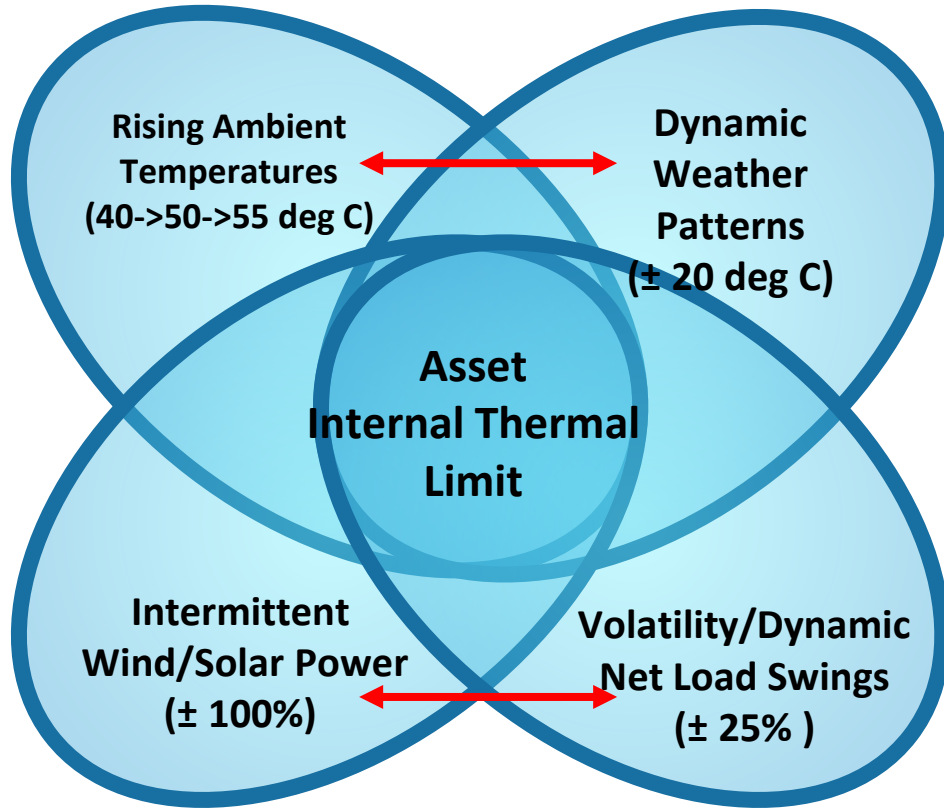
Three Case Studies

Digitalization Improves Utility Performance for Energy Transition

(Not Possible Without Digitalization)

Case 1: Dynamic Thermal Limits – Climate Change

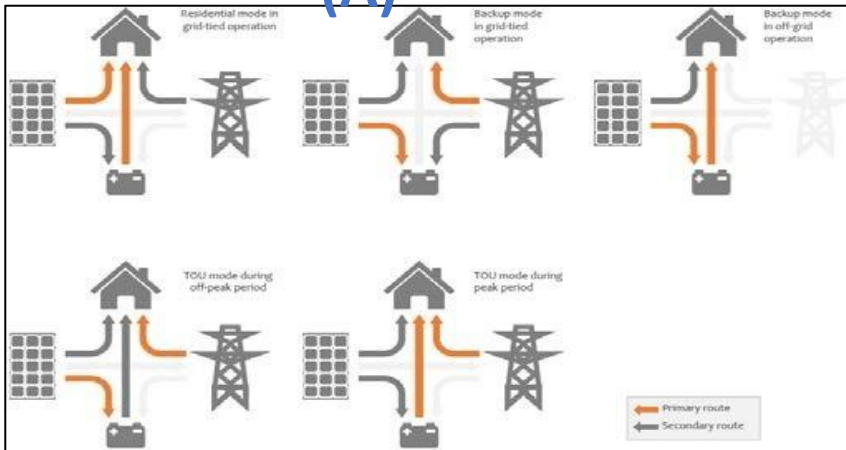
Avoid 10-15% Name-Plate Derating; Fiber-optic Digital Temperature Measurement



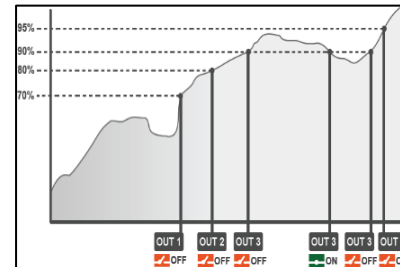
Case 2: Dynamic Power Management - Customer Asset

Optimizing Customer Owned Assets: Energy Storage, Dynamic Reactive Power (DRP), Hybrid Inverters

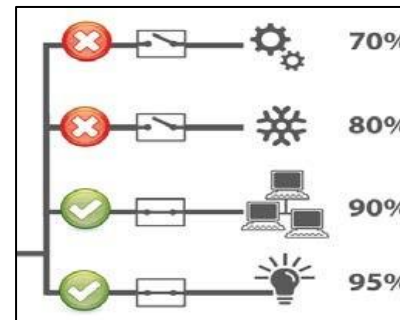
(A)



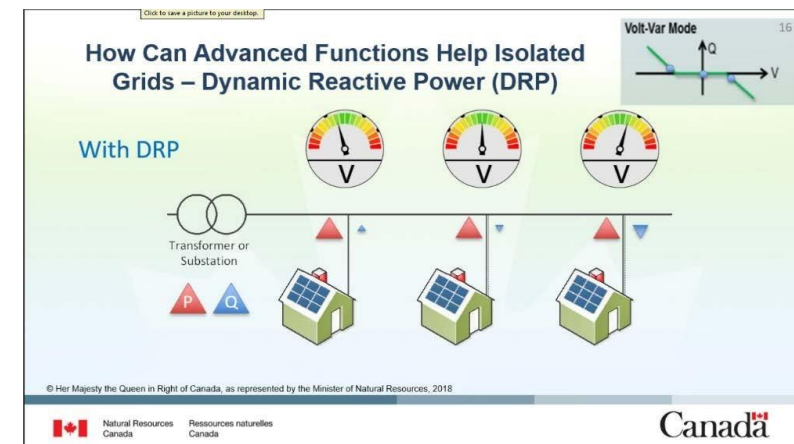
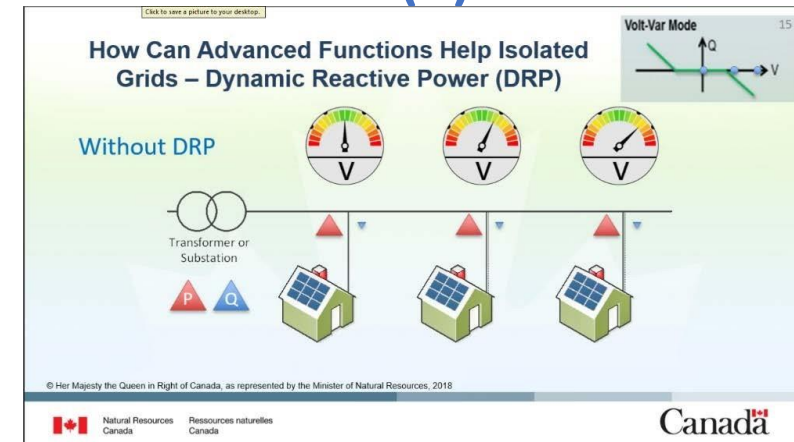
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Adaptive Autonomous Load Control



(C)



Case 3: Adaptive Load Management - EV Charging

Figure 1. Standard Charging Scenario

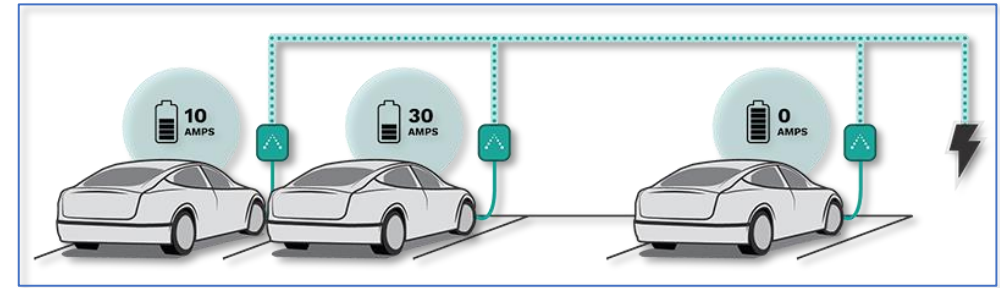
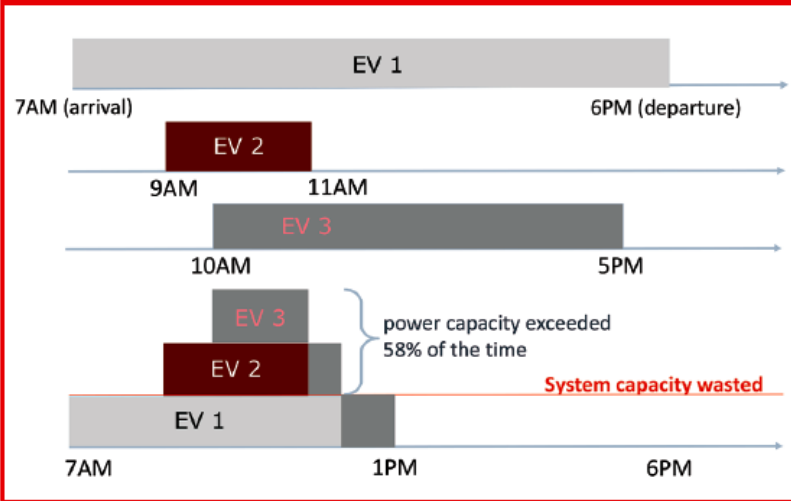


Figure 2. Typical Load Balancing

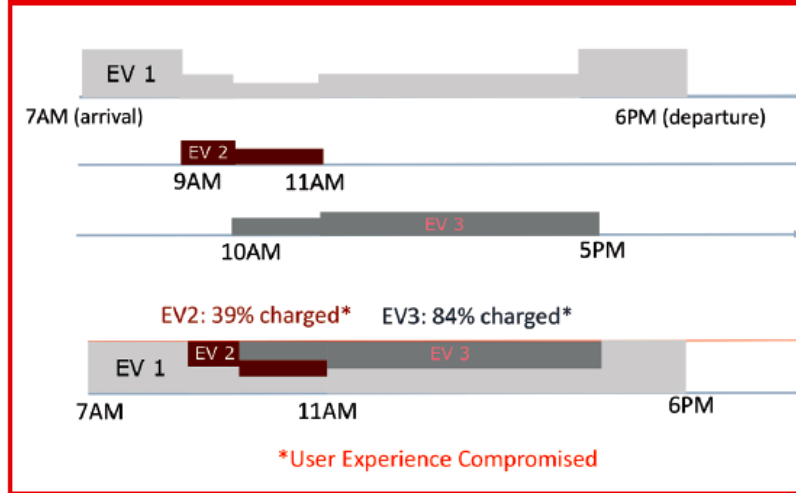
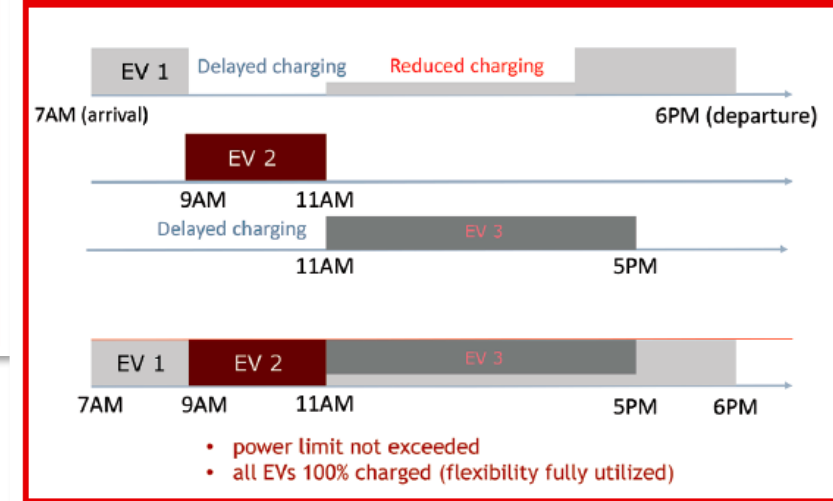


Figure 3. Adaptive Load Management



Key Takeaways / Recommendation

Digitalization is Key to Managing Utility Operations Effectively

Prudent investments based on prioritized Business Case

Key Focus Areas

- Multiple vendor platforms (hardware & software) and data store
 - GIS, DA, DERMS, ADMS, NMS
- Real-time, synchronized, time-stamped data exchange
- Data management and timely updates

Challenges

- Interoperability of connected systems and protocols
 - 61850, DNP, Modbus
- Communication handshake data delays
- Lag due to bandwidth (wireless, fiber)
- Cyber-security management

Thank You

Any questions?

Ravi Seethapathy

 ravi.seethapathy@gmail.com