

April 15-16, 2025 | Hotel X, Toronto, Canada

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A roadmap of roadmaps to a modernized digital grid

John Matthiesen Senior Director eGRID Growth & Strategy, Hatch

John Birnie Principal Consultant, Hatch

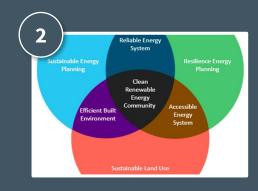


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Agenda



Set the Stage



Integrated Framework



Benefits of an Integrated Framework



The Expanding Utility Challenges

Decarbonization Electrification Inverter Based Resources Energy Efficiency 3 Ds **Digitization Decentralization** Automation Prosumers • Data Analytics & Governance • DERs • Generative AI / LLM / DTw • Grid Edge devices

Aging Infrastructure

- Condition Assessments
- Capital prioritization
- Increased system observability/controllability

IT / OT Modernization

- EMS/ADMS
- AMI 2 0
- GIS (Network Model)
- DER Management
- Telecommunications

Technological Advances

- Long planning cycles vs. shorter technological obsolesce
- "Shiny Objects"



Balancing Conflicting Priorities

- Various departments have own priorities
 - Often not aligned
 - Multiple roadmaps / plans from different teams
- Reliability Needs vs. Capital Budget
 - Prioritization of asset renewal vs. network expansion
- Shiny Objects
 - Unsure how to integrate into existing plans
 - Distraction from established plans
 - New functionality vs. desired capability
 - Are supportive systems available?



Solution: Bring the Pieces Together

Integrated Framework (e.g. Modernization Focus)

Operations Roadmap IT Roadmap **Control Room Integration** Functional Architecture 01 System Architecture **Outage Management Data Architecture** Field Crew dispatch Data Governance **System Monitoring** Data Hierarchy Mobile worker **Planning Roadmap DER Roadmap Condition Assessment DER Management System** Capital prioritization **Hosting Capacity Mapping**

Program Alignment

- Program Governance
- Modernization KPIs
- Regulatory Impacts
- Environmental Impacts
- Organization Structure
- Training & Development
- Change Management

DER Use Case Strategies

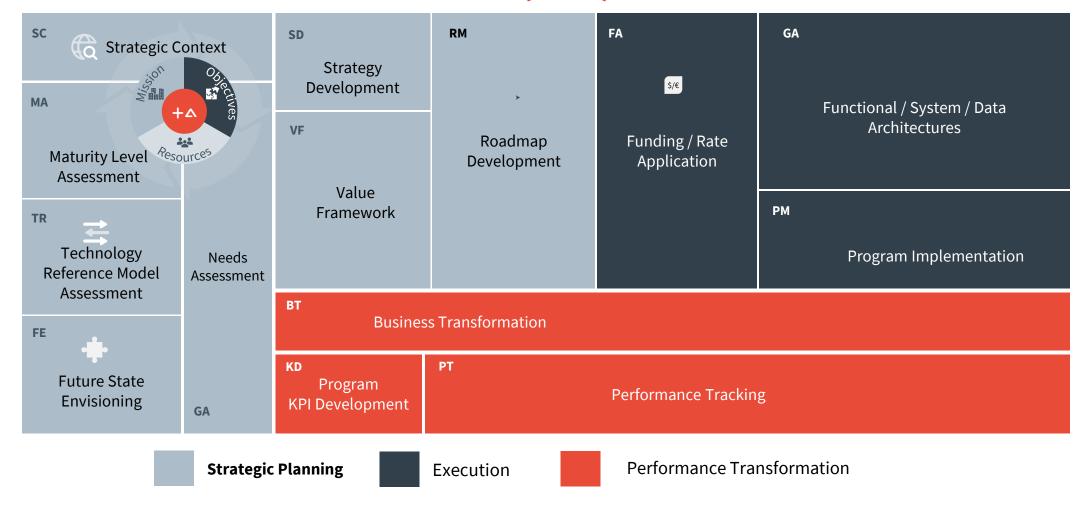
Market Clearing Process

Asset Accounting

Asset Management

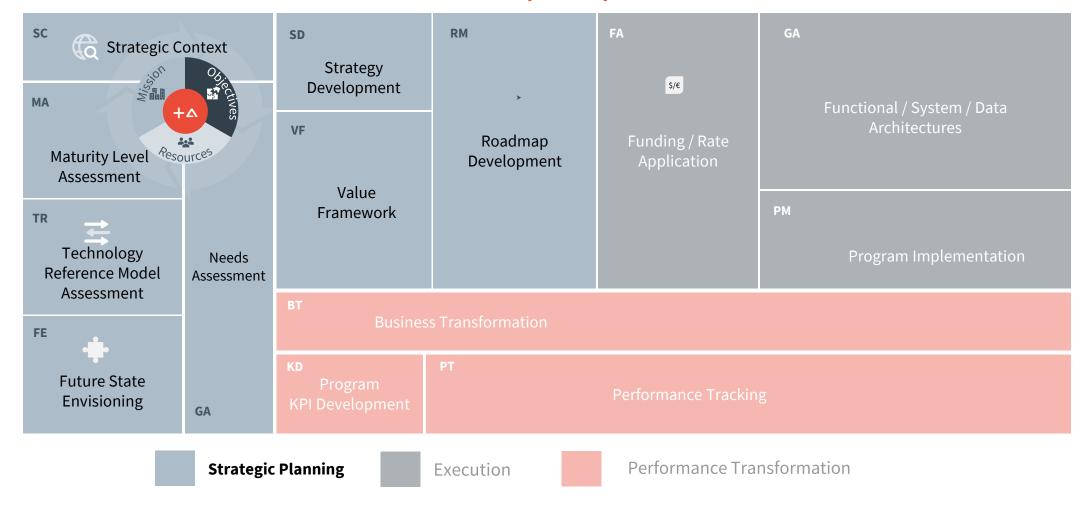
Risk Management

Integrated Modernization Framework Performance-Based Modernization (PBM) Model





Integrated Modernization Framework Performance-Based Modernization (PBM) Model





Strategic Planning Process*

Supporting Tasks

6. Continuous Improvement

Update the roadmap to align with evolving goals and market advancements



Core Tasks

1. Current State Assessment

Identify current Modernization capabilities used in the system

5. Business Transformation Layer

Define the structures and changes needed to ensure Modernization success



2. Mission and Objectives

Define the desired direction and goals to be achieved by modernization

4. Performance-based Drivers

Define KPIs to track progress towards achieving the defined mission and objectives



3. Future State Envisioning

Identify the capabilities needed to achieve the defined mission and objectives

ROADMAP Creation





Strategic Planning Process*

Supporting Tasks

6. Continuous Improvement

Update the roadmap to align with evolving goals and market advancements

Modernization Strategic Planning Process

Core Tasks

1. Current State Assessment

Identify current Modernization capabilities used in the system

2. Mission and Objectives

Define the desired direction and goals to be achieved by modernization

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to ensure Modernization success

Define the structures and changes needed



3. Future State Envisioning

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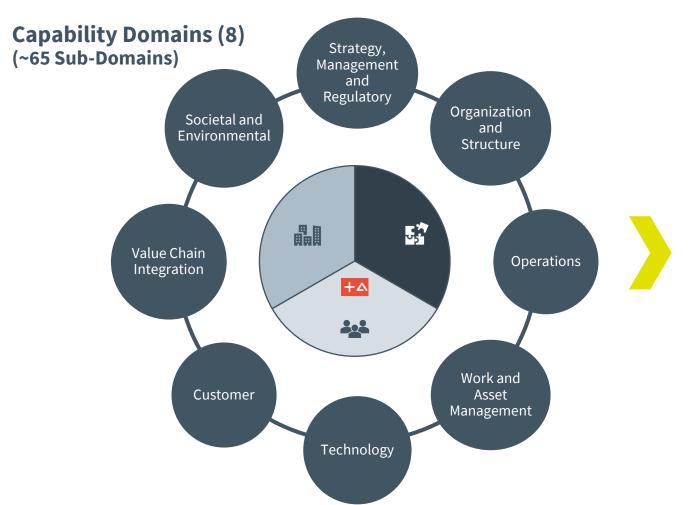
Identify the capabilities needed to achieve the defined mission and objectives

ROADMAP Creation





1. Current State Capability Assessment



Maturity Level (5)

PIONEERING	Breaking new ground; industry-leading innovation
5	
OPTIMIZING	Optimizing grid modernization to benefit entire organization;
4	may reach beyond organization; increased automation
INTEGRATING	
3	Integrating grid modernization across the organization, realizing measurably improved performance
ENABLING	
2	Investing based on clear strategy, implementing first projects to enable grid modernization (may be compartmentalized)
INITIATING	Taking the first steps towards capability, exploring options, developing the vision for grid modernization
1	
DEFAULT	Default lavel (no canability)
0	Default level (no capability)



1.1 Technology Mapping

- Current technology / software stack
- Sorted by:
 - Enterprise
 - Operations / Control
 - Field



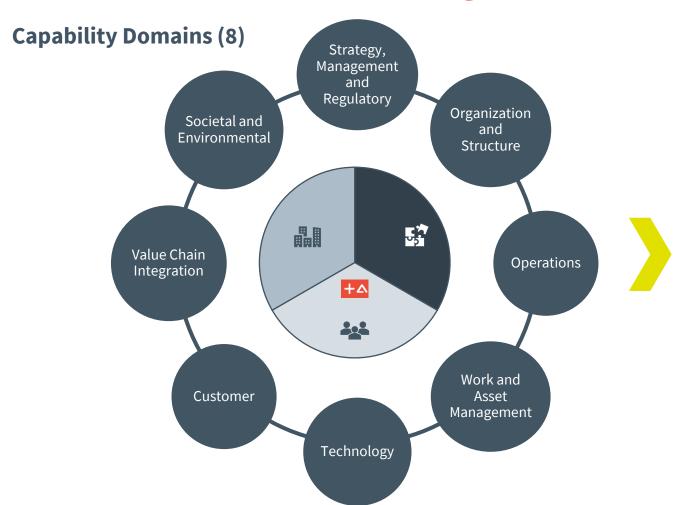


2. Mission and Objectives





3. Future State Envisioning



Maturity Level (5)

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O DEFAULT	Default level (no capability)



3.1 Technology Opportunities

- Consider Future state technology opportunities
 - GenAl
 - Automation
 - LLMs
 - Systems
 Integrations &
 Interoperability
 - Systems Optimization



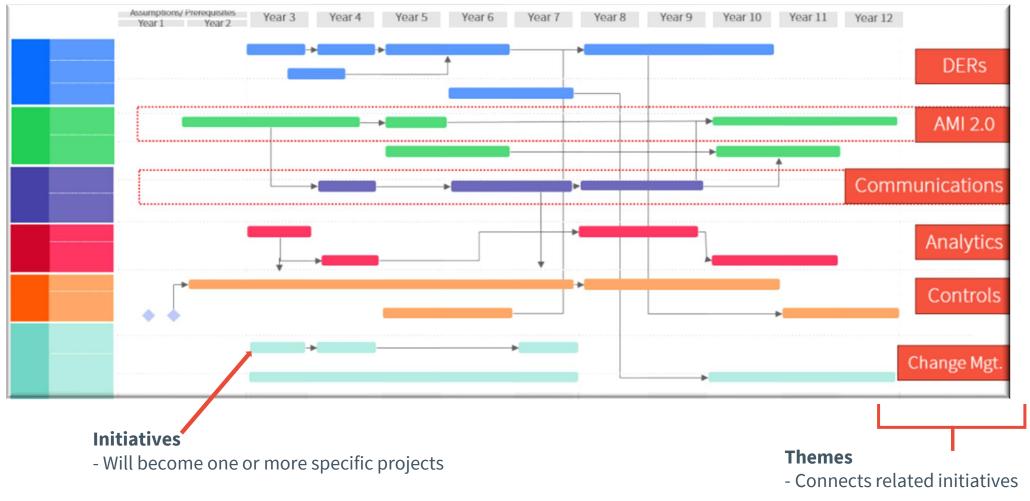


Roadmap Creation





Themes & Initiatives in Roadmap





Initiative Planning Requirements

Owner

Responsible person or team to plan and execute the initiative

Level of Effort

Amount of time to plan and execute each phase of the initiative

Budget

Order of Magnitude capital cost (Class 5)

People

for both current and future states

Process

 What new processes, changes process, or obsolete processes impact the future state

Technology

- What new, changes, or obsolete technologies impact future state
- What is the interoperability impact



Benefits of an Integrated Roadmap

Key Takeaways

- ✓ Process ensures executive support
- ✓ How to manage new shiny technology
- ✓ Clarity of interdependencies between initiatives
- ✓ Understand impacts of deferring capital spend
- ✓ Foundational technology planning
- ✓ Change management & training integrations
- ✓ MOST IMPORTANT: Aligned <u>single vision</u>



Questions



+ Thank you.

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