

Transitioning to the Future Grid in MA

Event Series

Event 1 | Exploring strategies for
an efficient grid transition

March 28, 2024



AGENDA

Welcome

9:00 AM

Alistair Pim, VP of Innovation & Partnerships NECEC

Venue Sponsor Remarks: The Effects of Climate Change on MA Municipal Expenditures

Bo Zhao, Senior Economist, Federal Reserve Bank of Boston

Welcome Remarks

Joe Curtatone, President, NECEC

Introduction

Dr. Emily Reichert, CEO, MassCEC

Opening Remarks

Secretary Tepper, Executive Office of Energy and Environmental Affairs for the Commonwealth of Massachusetts

Presentation by Sarah Cullinan, MassCEC

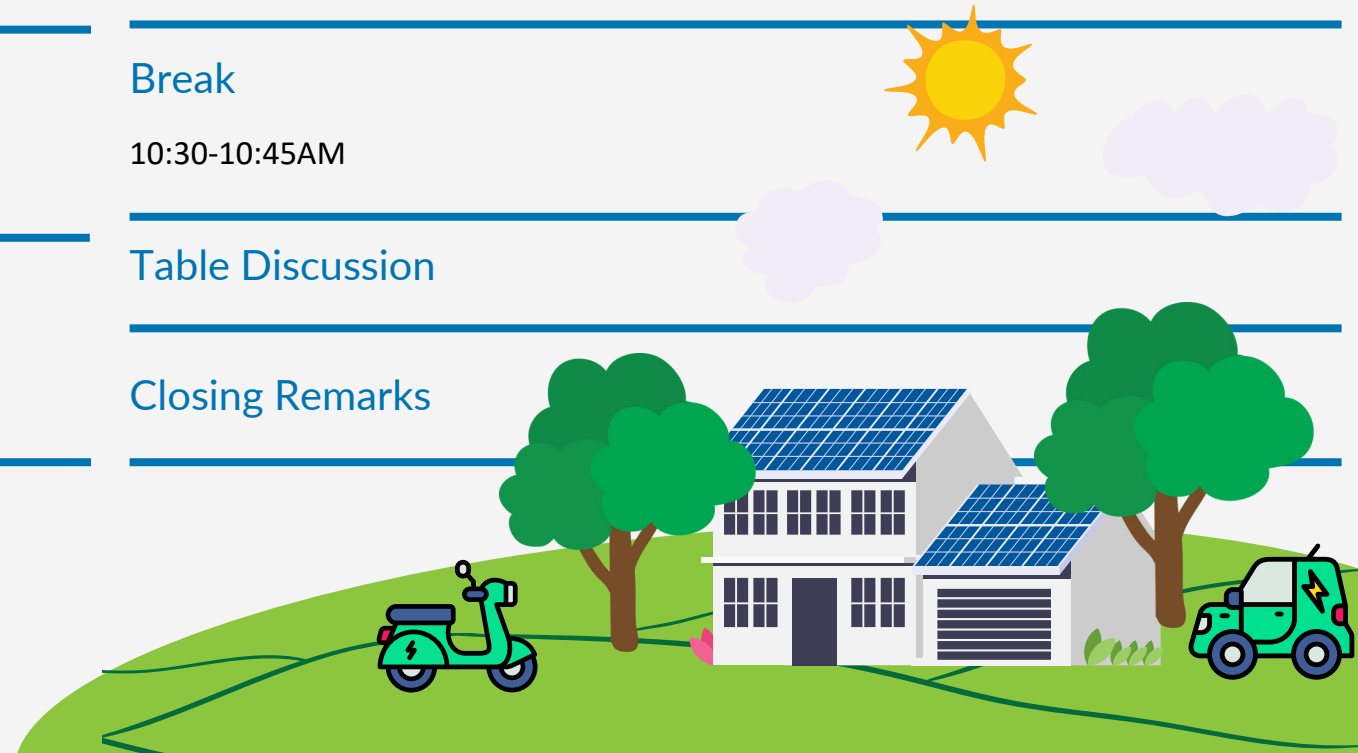
GMAC reflections and proposed strategies

Break

10:30-10:45AM

Table Discussion

Closing Remarks



Sarah Cullinan

Senior Program Director, MassCEC



Transitioning to the Future Grid

A MassCEC & NECEC Event Series



March 2024

Image credit: NCSL

1

Setting the Stage

- ▶ Future grid challenge
- ▶ Existing efforts & this event series

2

Setting the Conversation

- ▶ Lay the groundwork for today's table conversation
- ▶ Serve as foundation for the rest of the series

Setting the Stage



Setting the Stage: Decarbonization Goals

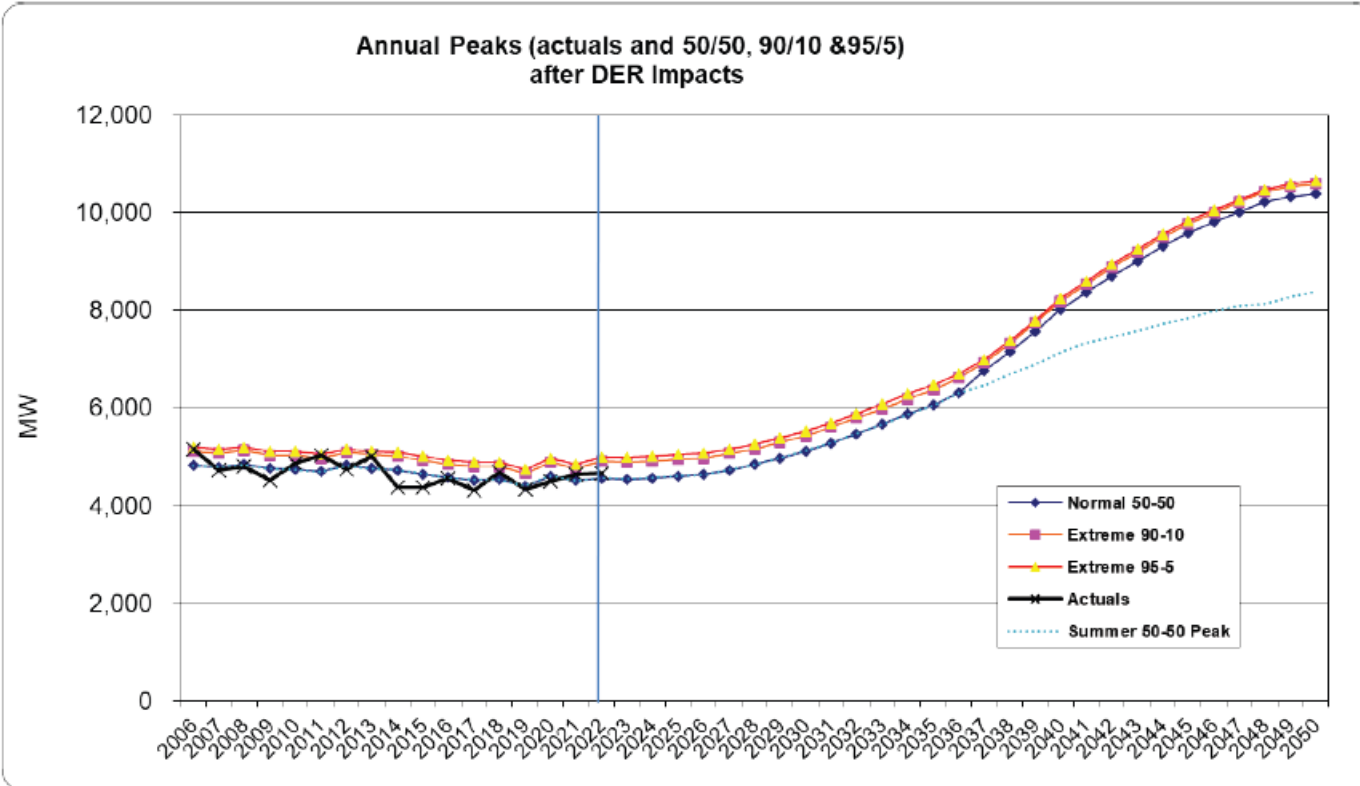







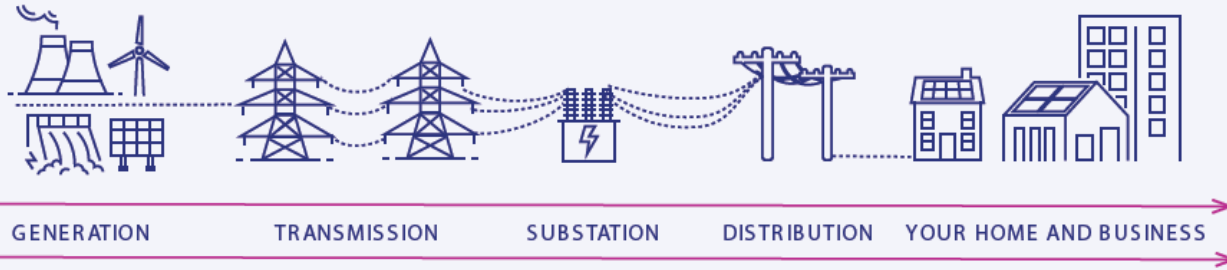
Figure 2: MECO Historical (actual & weather-adjusted) and Projected Peaks

- 
Customer demand forecast to be 2x+ higher than today
- 
Connect and manage 75x the number of EVs
- 
Connect and manage 10x the renewable energy
- 
Connect and manage 2x the energy storage
- 
Connect and manage 100x the number of heat pumps

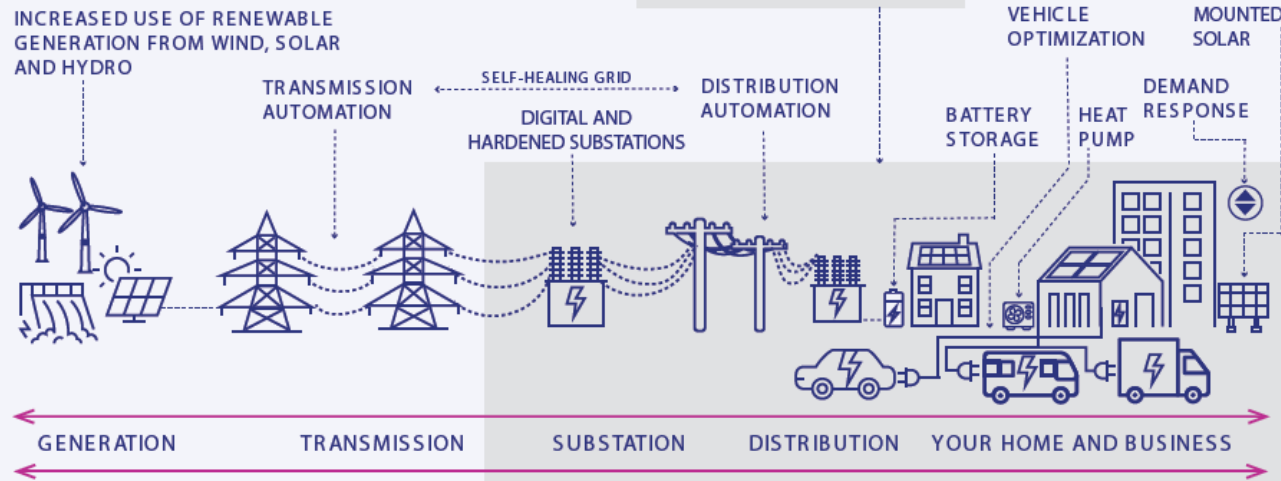
* From National Grid and Eversource ESMPs

Key Features of the Future Grid

Yesterday's Grid



Tomorrow's Grid



* From National Grid ESMP

Key Features:

- ▶ Energy flows in two directions, from many generation sources, located at different places on the transmission *and* distribution grid
- ▶ Customers will receive and provide energy and services to the grid
- ▶ The grid hosts thousands of devices that capture and respond to data from across the grid
- ▶ A future, modern grid must consider Environmental Justice Communities and ensure an equitable energy transition
- ▶ Must balance welcoming innovation and new technology, while also guaranteeing reliability



We're here.

This event series proposes one forum to help think through how to make this transition a reality.



The challenge is significant.

The future grid must:

- Meet unprecedented demand
- Achieve decarbonization goals
- Ensure reliable, affordable, equitable access.

Event Overview

The Challenge

The grid transition ahead is uncharted territory. Navigating the transition **requires**

- **new ways of thinking**
- **new processes**
- **new relationships.**

The Objective

Develop strategies that lean into

- **Collaboration**
 - **Innovation**
- to help make the transition to a future grid **more efficient and effective.**

Series: Content and Calendar

- **Today:**
 - Introduction & table-setting
- **Interim Convenings:**
 - To be announced
- **September 26 @ The Engine:**
 - Take-aways and next steps





We're here.



The challenge is significant.

The future grid must:

- Meet unprecedented demand
- Achieve decarbonization goals
- Ensure reliable, affordable, equitable access.

Significant work and progress has already occurred.



**Electric Sector
Modernization Plans
(ESMPs)**



**Grid Modernization
Advisory Council
(GMAC)**



We're here.

Electric Sector Modernization Plans (ESMPs)



The Climate Law requires that the state's EDCs prepare ESMPs to proactively upgrade the distribution system and meet multiple objectives

- Improve grid reliability, communications, and resiliency;
- Enable increased, timely adoption of renewable energy and DERs;
- Promote energy storage and electrification tech for decarbonization;
- Prepare for climate-driven impacts on T&D systems;
- Accommodate transportation, building electrification, and new loads;
- Minimize or mitigate impacts on ratepayers.

Grid Modernization Advisory Council (GMAC)



What does the GMAC do?

- GMAC reviews and provides recommendations to the EDCs on the ESMPs.
- It is an integral part of increasing transparency and stakeholder engagement in the grid planning process.

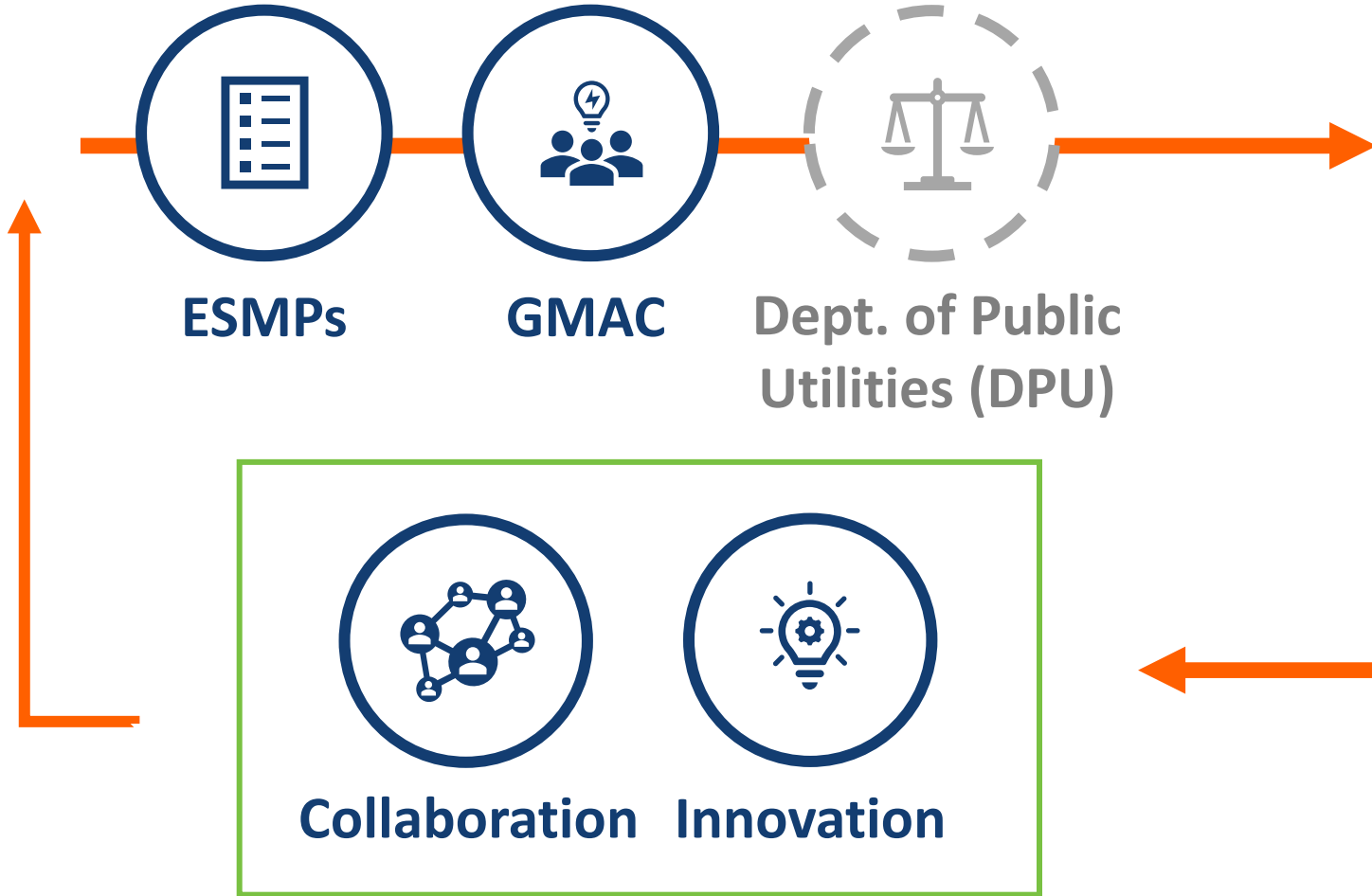


Who is on the GMAC?

- GMAC members, 15 voting and 2 non-voting (electric utility representatives), represent a wide array of organizations and interests.
- Members are appointed by the Governor and serve five-year terms.
- The Commissioner of the DOER chairs the GMAC, which is supported by DOER staff.

This is Just the Beginning...

Jan - Aug 2024



The first Future Grid planning process represents an enormous, novel body of work, and substantial progress.

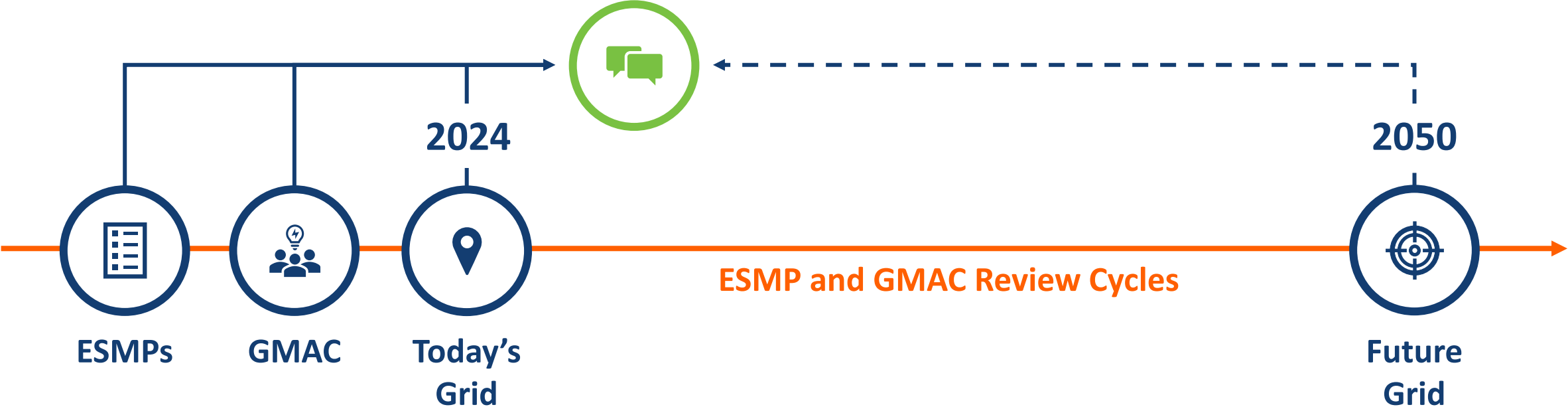
But this is just the beginning...

Setting the Conversation



Today's Conversation & Event Series

Grid Transition Event Series



Reflections from GMAC Participation

The list of requirements is daunting.

- One interconnected system to support nearly every aspect of our lifestyles and economy
- While balancing affordability and equity
- And maintaining unwavering safety and reliability

Efficiency gains and a lean grid should be priority.

- Advance affordability
- Alleviate siting challenges
- Address grid constraints faster, flexibly



Getting from today to 2050 is complex.

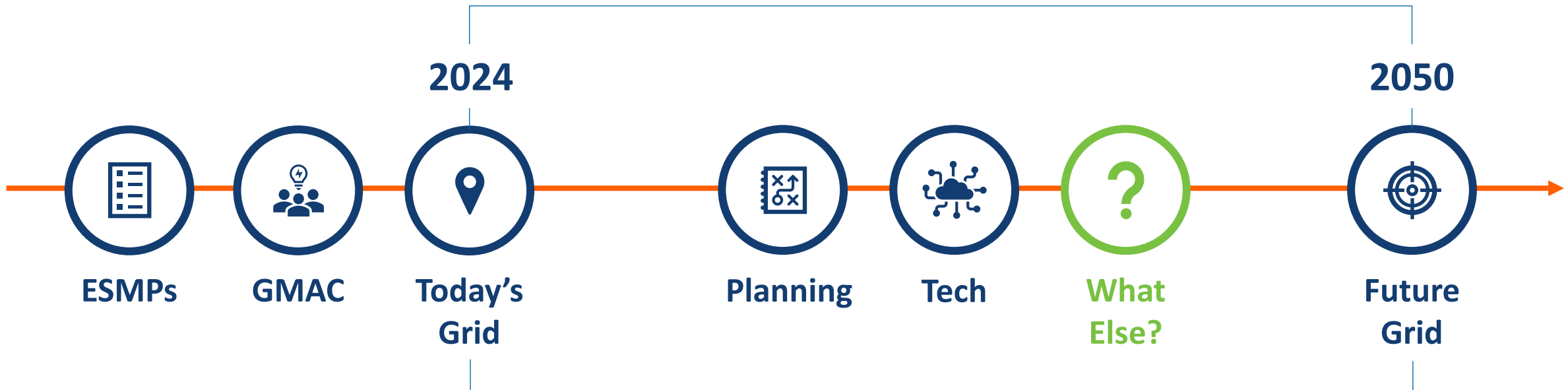
- Where, when, and how much electrification and hosting capacity need will pop across the system?
- Will benefit from increased information flow

Our best model for grid planning is evolving.

- Both top down (utility) and bottom up (grid users)
- Guided by a long-term strategy
- Iterative in the medium-term
- Flexible and responsive in the short-term

Getting to the Future Grid

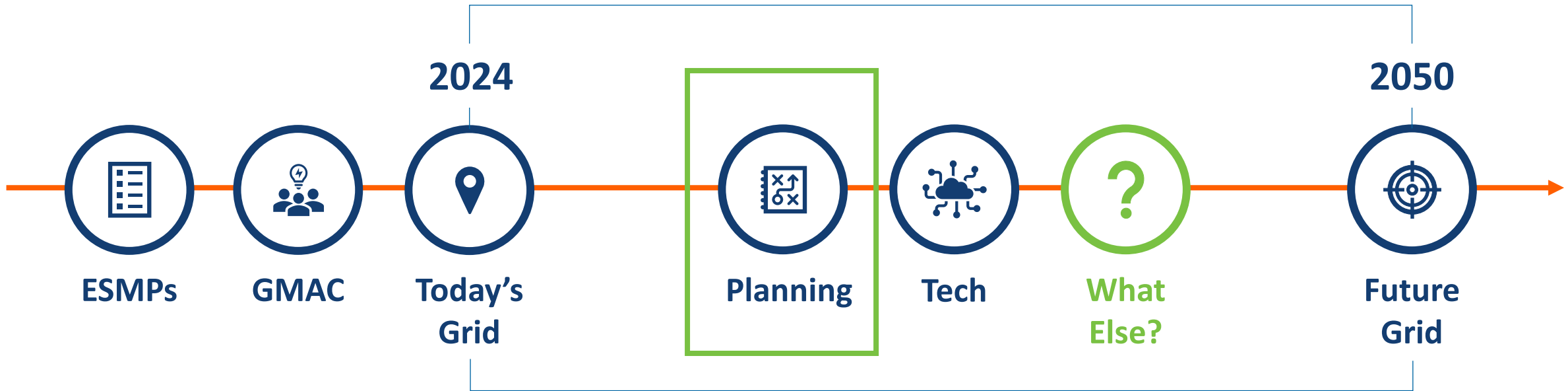
The future grid needs to be efficient, flexible, and democratized.



The only way to solve for these challenges is with new levels of collaboration and innovation.

Getting to the Future Grid

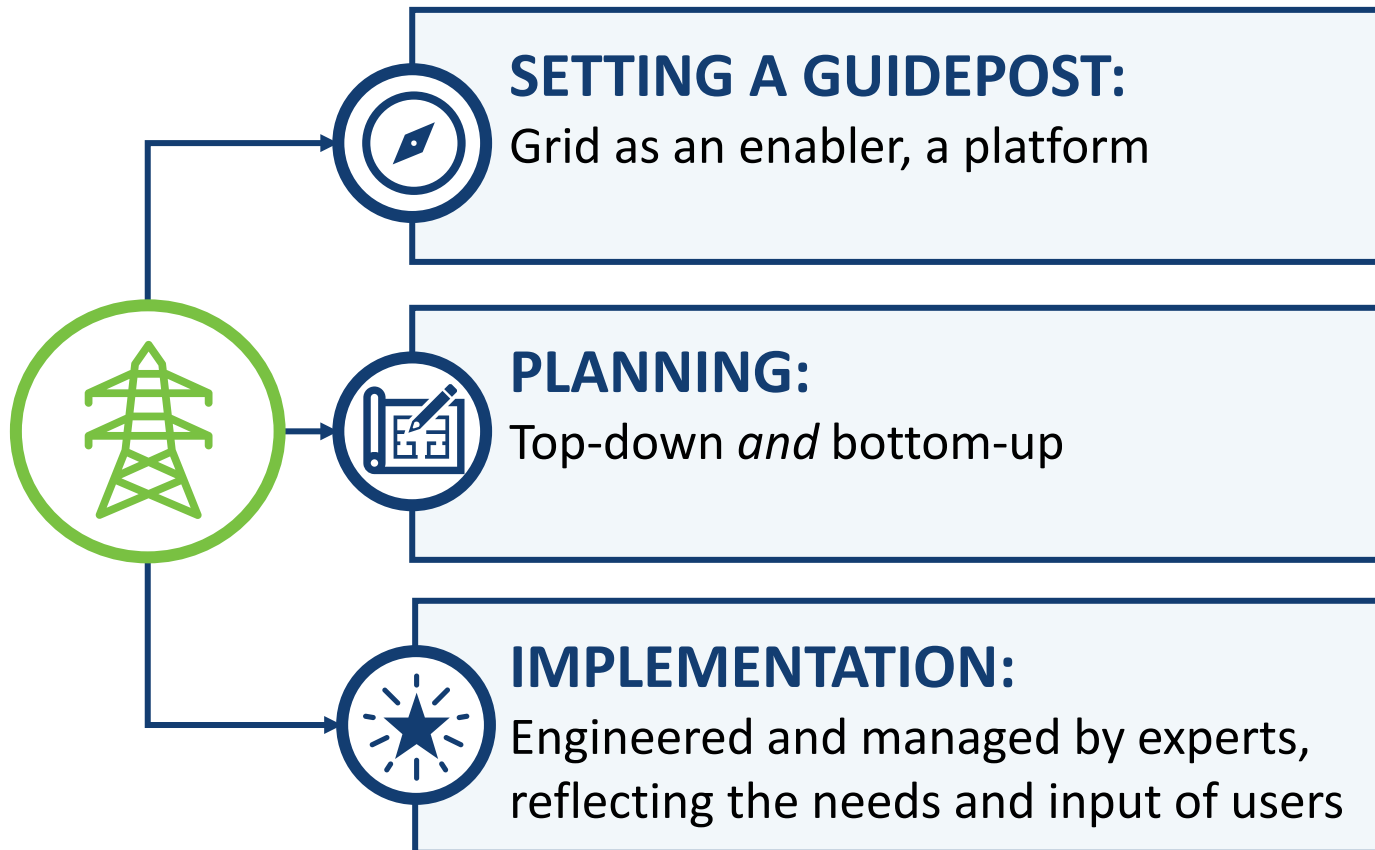
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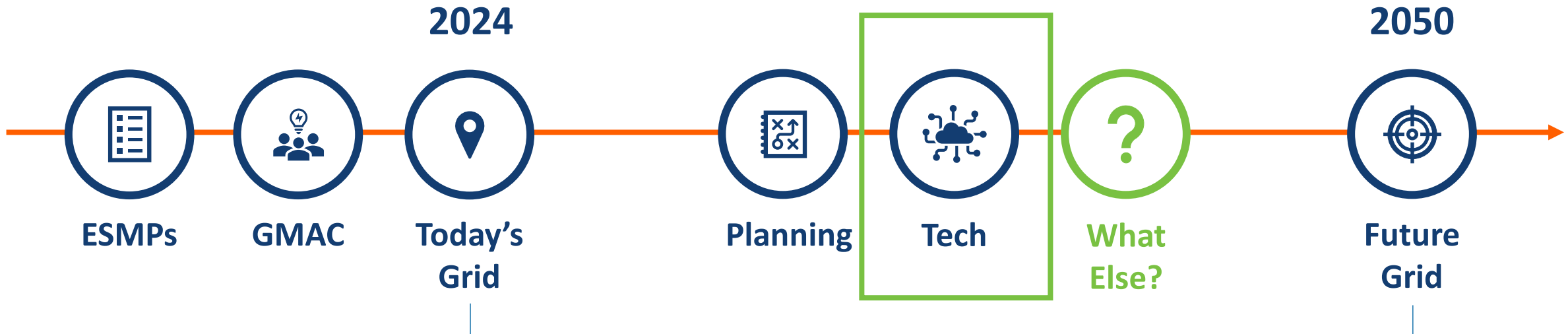
Proposed Strategy: Grid Planning Reimagined

A VISION FOR GRID PLANNING



- How can **information flow** seamlessly and timely from grid users to grid planners?
- What type of **formal or informal processes** should be developed?
- What **innovative tools and regulatory structures** are needed for a new approach to planning?

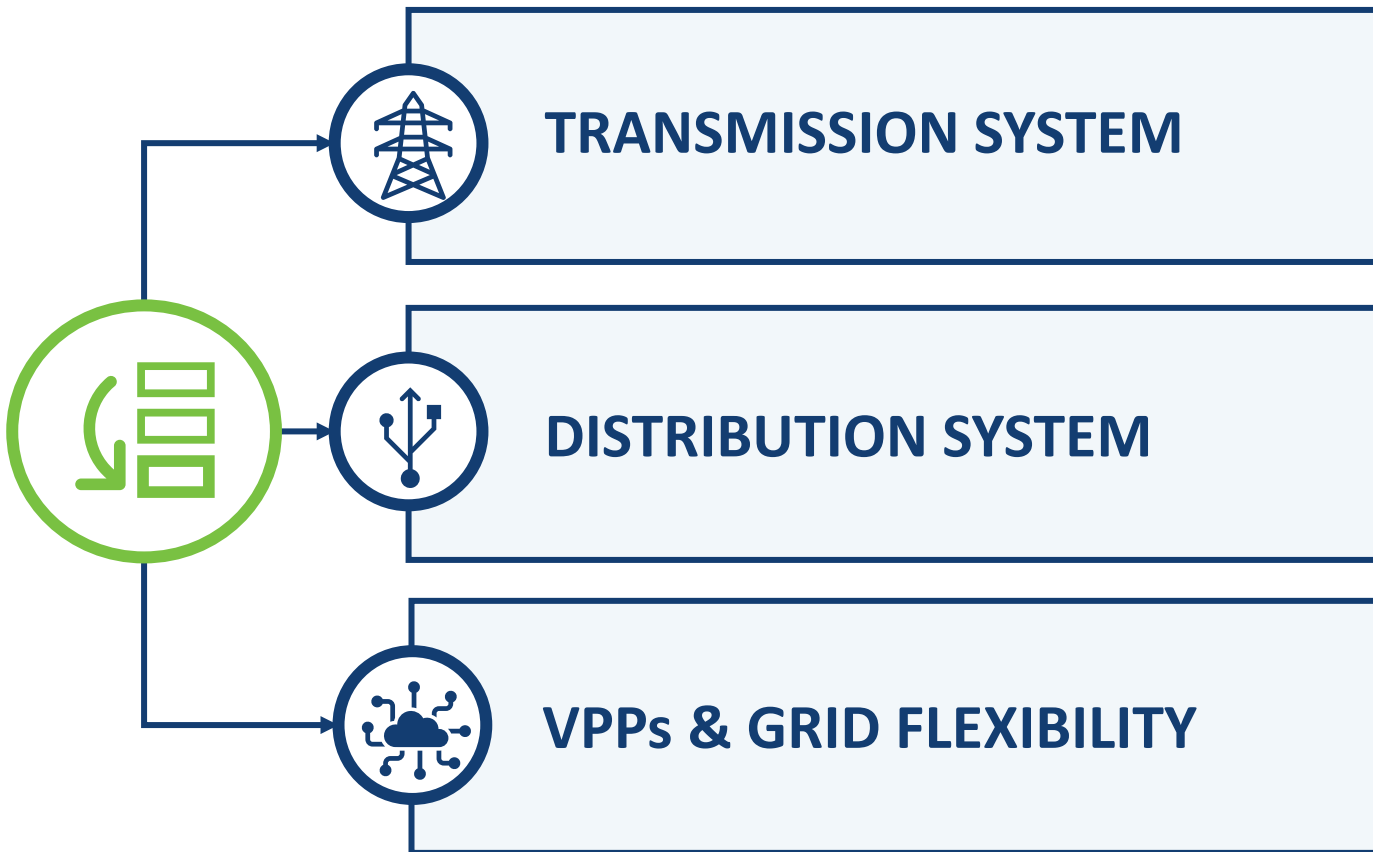
Getting to the Future Grid



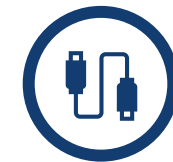
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Proposed Strategy: Championing Grid Technology

GRID TECH FOR EFFICIENCY AT ALL LEVELS



Aspects to consider?



Physical tech

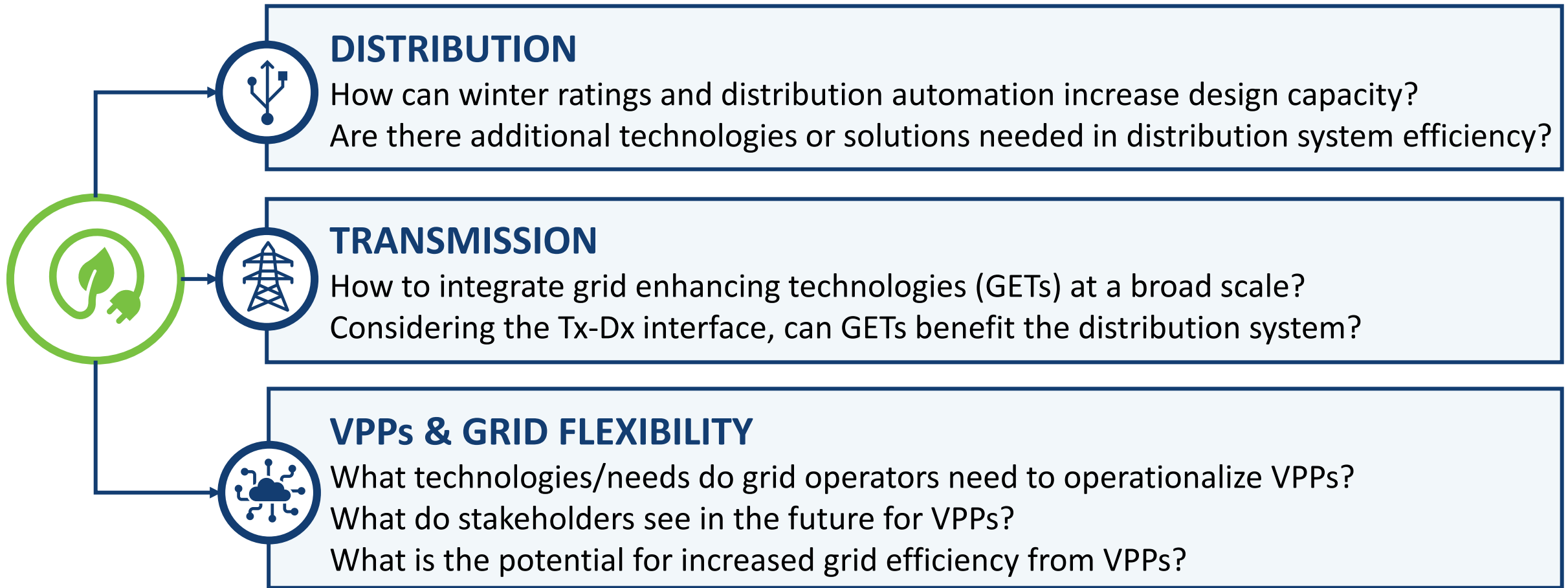


Supportive/software solutions

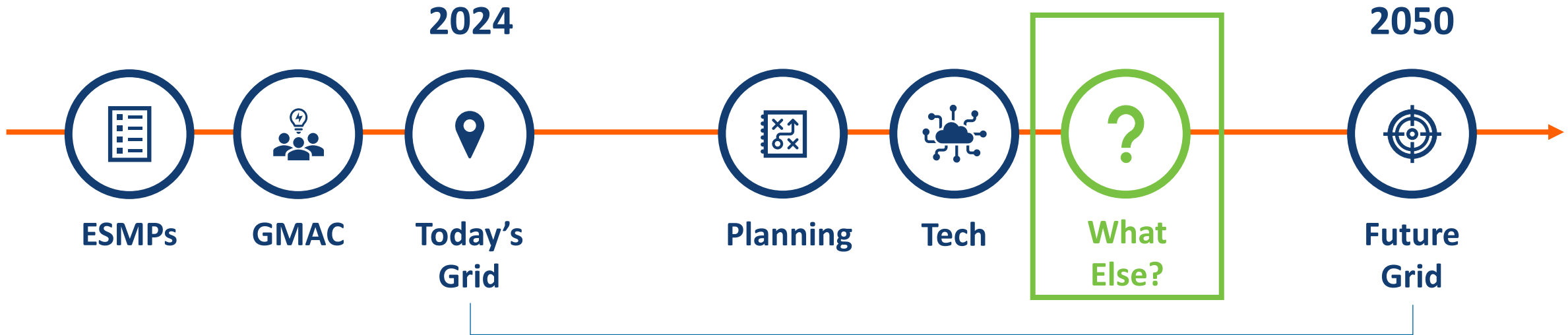


Implementation pathways

Proposed Strategy: Championing Grid Technology



Proposed Strategies: What Else?



The only way to solve for these challenges is with **new levels of collaboration and innovation.**

Final Thoughts

The Challenge

The **grid transition** ahead is **uncharted**.

Navigating the transition **requires**

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Discussion Questions

GRID PLANNING

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- What type of formal or informal processes should be developed?
- What innovative tools and regulatory structures are needed for a new approach to planning?

GRID TECH

- How can winter ratings and distribution automation increase design capacity?
- Are there additional technologies or solutions needed in distribution system efficiency?
- How do we GETs at a broad scale?
- How should we think about the distribution-transmission interface?
- What technologies do grid operators need to operationalize VPPs?
- What do stakeholders see in the future for VPPs?
- What is the potential for increased grid efficiency from VPPs?

