KEY TAKEAWAYS

THE NON-WIRES SOLUTIONS IMPLEMENTATION PLAYBOOK

A PRACTICAL GUIDE FOR REGULATORS, UTILITIES, AND DEVELOPERS

BY MARK DYSON, JASON PRINCE, LAUREN SHWISBERG, AND JEFF WALLER

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Rocky Mountain Institute (RMI)—an independent nonprofit founded in 1982—transforms global energy use to create a clean, prosperous, and secure low-carbon future. It engages businesses, communities, institutions, and entrepreneurs to accelerate the adoption of market-based solutions that cost-effectively shift from fossil fuels to efficiency and renewables. RMI has offices in Basalt and Boulder, Colorado; New York City; Washington, D.C.; and Beijing.

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KEY TAKEAWAYS

KEY TAKEAWAYS FROM *THE NON-WIRES SOLUTIONS IMPLEMENTATION PLAYBOOK*

The dynamics of today's electric grid do not ensure that energy is efficiently distributed or that capital is efficiently allocated. Increasingly, portfolios of distributed energy resources (DERs)—also known as non-wires solutions (NWS)—can address these current inefficiencies by solving grid needs more cost-effectively than business-as-usual approaches to traditional infrastructure investment.

NWS are applications of DERs in specific locations that defer or eliminate an investment in traditional and costlier "wires-and-poles" infrastructure. In addition to deferring or avoiding more expensive traditional investments and providing reliable electric service, NWS can deliver ratepayers cost savings and support the integration of smart, customer-centered technologies that promote a cleaner, more flexible, and more resilient grid. However, despite these clear benefits, three key barriers have hampered widespread non-wires solution deployment: regulatory environments are not appropriately designed to encourage NWS, utility standard operating procedures do not systematically consider NWS, and procurement practices need to be refined to more effectively source NWS.

To help overcome these barriers and capture the compelling benefits NWS can provide, Rocky Mountain Institute published *The Non-Wires Solutions Implementation Playbook: A Practical Guide for Regulators, Utilities, and Developers*. The Playbook delineates innovative approaches to spur non-wires solution adoption and recommends planning and operational strategies to improve non-wires solution processes. This document summarizes key takeaways.

Utility investment in distribution infrastructure is big business

Since 2006, regulated utilities across the US have invested $55 billion each year, on average, in distribution, transmission, and generation infrastructure.[1] Historically, distribution infrastructure has represented the greatest share of utilities' expenditures as utilities seek to maintain and modernize extensive last-mile networks to serve hundreds of millions of electricity end-users.

Utilities have an incentive to make these investments because they are entitled to earn a regulator-approved rate of return on the capital expenditures that are included in their rate base (e.g., power plants, distribution lines, transformers). Even as electricity sales and peak demand have stayed flat in recent years, utility investments added to the rate base have increased. The rising ratio of utility distribution assets per customer raises concerns that rates may increase as the cost of distribution investments are passed through to customers for years to come.[2] To mitigate this risk, it is critical that grid investment decisions are prudent and result in the most cost-effective solutions.

Distributed energy resources can be used as non-wires solutions to save ratepayers money

Utilities and regulators can adapt existing planning processes in order to consider all possible solutions when making investments to address grid needs. Specifically, by taking advantage of the proliferation of distributed energy resources (DERs) and energy management software solutions, planning processes can ensure grid services are provided by the most cost-effective options, and provide safe, reliable electric service for customers.

In *The Non-Wires Solutions Implementation Playbook*, we define DERs to include distributed generation (e.g., rooftop or community-scale solar PV), energy storage (e.g., batteries), and both software and hardware approaches to energy efficiency and demand response—technologies that generate electricity or control loads and are directly interconnected to low-voltage electric distribution systems.

When DERs are used to solve grid needs that would have otherwise required traditional utility infrastructure, they can be considered non-wires solutions (NWS). NWS are applications of DERs in specific locations that defer or eliminate an investment in traditional and costlier "wires-and-poles" infrastructure. NWS have also been called non-wires alternatives (NWA), which implies that they will be evaluated as alternatives to wires-and-poles infrastructure. In contrast, the terminology of "non-wires solutions" institutionalizes NWS as part of the utility's standard solution toolkit, implying that they should be considered as part of a basic set of options.

Non-wires solutions provide a host of benefits and should be a key component of innovative distribution planning processes

States and utilities can incorporate NWS into distribution-level grid modernization and integrated planning efforts that are increasingly taking place across the nation. In addition to cost savings, the effective integration of NWS into planning processes can help capture the range of benefits that DERs and NWS provide, including:

- **Ratepayer cost savings:** Since NWS are typically pursued only if they are determined to be more cost-effective than alternative infrastructure options, they should lead to lower costs for ratepayers.
- **Flexibility for planning processes:** Instead of investing in new infrastructure projects based on long-term, uncertain forecasts, planners can deploy modular, flexible NWS portfolios when and where they are needed. This mitigates the risk that large investments will become stranded if load growth doesn't materialize as forecasted and provides a time-value-of-money benefit because more significant expenditures can be delayed until needs are realized.
- **Progress toward clean energy goals:** NWS projects deliver value by deferring or eliminating the need for traditional infrastructure. By stimulating demand and increasing the adoption of low-carbon resources like energy efficiency and demand response, NWS reduce the need for marginal, more carbon-intensive generation.
- **Opportunities to test new utility business models:** Utilities can use NWS to experiment with new ways of engaging with their customers as well as innovative technology companies. As utilities adapt to a changing set of consumer preferences, NWS can provide an opening to partner with customers and create DER programs that improve customer satisfaction and reduce the probability of ratepayer defection.
- **Local economic development:** Rather than deploying traditional utility-owned infrastructure, NWS can provide opportunities for local investment in communities where customer-sited solutions can address grid needs.
- **Job creation:** Whereas traditional infrastructure equipment markets are mature, NWS projects support the animation of DER markets where rapid innovation is unlocking significant potential for new job growth.

To scale NWS several important market barriers must be addressed

Despite their benefits, markets for NWS remain nascent. Although utilities across the nation spend tens of billions of dollars each year on distribution infrastructure, only a few have pursued NWS at scale. This sluggish uptake is due to a number of barriers, including:

Regulatory frameworks that do not always encourage NWS

- Traditional cost-of-service utility regulation incentivizes capital investment in grid infrastructure that is not easily compatible with NWS, which are designed to provide cost-savings.
- Distribution planning processes have historically been opaque, making it difficult for regulators and market participants to identify and develop alternative solutions to address utility grid needs.

Limited utility processes and expertise around NWS

- At most utilities, institutional capabilities are not yet sufficiently robust to effectively plan for, procure, and manage NWS at scale.
- Utilities do not currently have enough readily available data to verify performance of demonstrated DER capabilities in non-wires solution applications.

Limited procurement experience, which inhibits competitive non-wires solution proposals

- Without clear standards or precedents, it is challenging for utilities and developers to efficiently work together through NWS procurement processes.
- To produce more competitive offers, developers require greater clarity on both the nature of grid needs that are suitable for NWS and the criteria utilities use to evaluate bids.
- In certain applications, potentially higher costs and longer deployment timelines may limit initial NWS project competitiveness.

Compounding these barriers, there is a need for coordination between four key sets of stakeholders to support NWS market development. As illustrated in Figure 1 below, legislators, regulators, utilities, and developers have the opportunity to take on distinct—and overlapping—roles and responsibilities to establish, cultivate, and guide the NWS market. Legislatures can choose to play a key role in the earlier stages of NWS market development, but collaboration from the other three stakeholder groups is critical throughout the entire NWS life cycle.

FIGURE 1

NWS ROLES AND RESPONSIBILITIES

Group is engaged

<table>
<tr><th></th><th>ROLES & RESPONSIBILITIES</th><th>LEGISLATURE</th><th>REGULATORS</th><th>UTILITY</th><th>DEVELOPERS</th></tr>
<tr><td rowspan="3">PHASE 1
Creating a hospitable environment for non-wires solutions</td><td>Define a vision.
Who determines the vision for pursuit of non-wires solutions in a given jurisdiction?</td><td>Articulates a vision by introducing bill that supports new procurement practices</td><td>Initiate a proceeding to support vision development and implementation of non-wires solutions</td><td>Expresses goals for implementation and how the non-wires solutions support their business</td><td rowspan="5">Ongoing role in stakeholder engagement processes</td></tr>
<tr><td>Develop incentives.
Who is responsible for creating and defining the incentives?</td><td>Provides impetus for non-wires solutions incentives through legislation</td><td>Develop the appropriate incentive structure for non-wires solutions</td><td>Engages in developing the incentive framework for non-wires solutions or proposes incentives to regulators</td></tr>
<tr><td>Consider projects systematically.
Who ensures that non-wires solutions are consistently considered as part of the utility planning process?</td><td>Mandates that utilities consider non-wires solutions that meet prescribed criteria</td><td>Define the process for how non-wires solutions projects are considered</td><td>Establishes internal processes for consideration of non-wires solutions</td></tr>
<tr><td rowspan="2">PHASE 2
Identifying non-wires solutions opportunities</td><td>Identify screening criteria.
Who designs the screening criteria for non-wires solutions?</td><td></td><td>Define the process for determining the criteria for identification of non-wires solutions</td><td>Refines screening criteria for particular circumstances</td></tr>
<tr><td>Share data.
Who decides what utility data is made available?</td><td></td><td>Define requirements and process for sharing data to support development of non-wires solutions</td><td>Ensures data is collected and shared to enable non-wires solutions while maintaining customer and data security</td></tr>
</table>

Table is continued on the next page

FIGURE 1 (CONTINUED)

Group is engaged

	ROLES & RESPONSIBILITIES	LEGISLATURE	REGULATORS	UTILITY	DEVELOPERS
PHASE 3 Developing and executing the procurement	**Scope the procurement.** Who determines needs and opportunities for non-wires solutions?		**Facilitate** project development, including approvals, cost recovery decisions, and process oversight (ongoing)	**Determines** needs and opportunities with data-based problem descriptions	**Propose** new and refine existing needs based on utility and other data
	Identify applicable technologies. Who determines what technologies are appropriate solutions to meet identified needs?			**Defines** solutions to be technology-agnostic and performance-based	**Propose** technologies and portfolios of solutions that can most effectively address needs
	Integrate technology portfolio. Who determines the appropriate technological solutions to meet the need identified?			**Integrates** portfolio of solutions to meet need	**Integrate** portfolio of solutions to meet need through contract with utility
	Determine asset ownership. Who owns the project? Are there any regulatory restrictions or requirements?			**Owns** some or all of the components in a non-wires solutions portfolio	**Own** some or all of the components in a non-wires solutions portfolio
PHASE 4 Implementing non-wires solutions	**Oversee operations and dispatch.** Who directs the operations of the project?			**Directs** project operations to meet needs and controls owned assets	**Control** assets under contract per utility terms, instructions, and signals
	Manage performance. Who assumes project performance risk?			**Assumes** risk for ultimate grid reliability and performance risk outlined in third-party contracts	**Accept** contracted performance risk associated with assets owned and contracted to utility
	Administer measurement and verification. Who is responsible for ongoing measurement and verification?			**Requires** and conducts specific measurement and verification practices to collect operational data	**Perform** ongoing measurement and verification to demonstrate performance per contract terms

The Non-Wires Solutions Implementation Playbook can help overcome barriers and scale the NWS market

The Playbook seeks to address the barriers to NWS and catalyze deployment across the nation. It draws upon interviews conducted with more than 65 experts across 15 states, including over 20 utilities, as well as developers, regulators, and trade associations. The intent is to provide a common set of recommendations that any jurisdiction can build upon to directly implement and scale NWS.

The Playbook is composed of two sections:

1. **Best Practice Framework**
   First, we provide an in-depth discussion of best practices for the three enabling factors that are critical for NWS implementation: a supportive regulatory environment; the integration of NWS into standard utility operating procedures; and holistic processes for NWS procurement.

2. **Implementation Guidelines**
   Second, we provide practical implementation guidelines for the four key components underpinning non-wires solution implementation: screening criteria; competitive solicitation processes; evaluation frameworks; and contracting considerations.

As with all effective practices, non-wires solution processes are likely to evolve as lessons are learned—and incorporated—from NWS procurement and implementation. While there were only ~2 GW of non-wires solution project capacity at different stages of development as of April 2017, there is significant opportunity for rapid acceleration of NWS deployment as best practices are adopted and standardized.[3]

THE SCALE OF THE NWS OPPORTUNITY IN A CHANGING GRID

Non-wires solutions can improve the system benefits of DER deployments and help realize more than $17 billion in additional net present value from DERs through 2030 across the US

Directly capturing the distribution-level benefits (e.g., distribution capacity deferral value[4]) of DERs at the project level via NWS can dramatically increase the system value of DERs. In light of the disparity in the quantification of avoidable costs (e.g., investment deferral opportunities) across distribution systems noted by other analysts,[5] and the corresponding difficulty in assigning a single value to distribution benefits, we instead highlight a few examples where NWS or similar programs that capture value from avoided costs on the distribution system can significantly improve the benefits available from DER deployment. Based on three illustrative examples, we find that including distribution-level benefits can improve system value of energy efficiency and demand flexibility measures by 30%, and battery storage by over 100%. In many cases, DERs are even cost-effective when only evaluated based on avoided generation costs. Using an average value of peak reduction for transmission and distribution,[6] we find that the additional, distribution-level avoided costs associated with the DER scenario are approximately $17 billion through 2030.

Non-wires solutions can unlock higher levels of DER deployment, offering significant carbon emissions reductions

Increasing DER deployment can provide carbon emissions reductions via both direct and indirect mechanisms.[7] DERs can help realize direct carbon reductions by avoiding carbon-intensive electricity generation on the bulk power system, either by reducing line losses, saving energy through efficiency measures, load shifting, or generating energy from distributed low-carbon sources. DERs can also enable indirect carbon savings by providing flexibility, thus reducing curtailment from and incentivizing investment in low-cost, zero-carbon, but variable energy resources like wind and solar.

While it is clear that the potential to reduce CO_2 through DER deployment is large, it is difficult to forecast the total magnitude by which NWS can increase deployment of DERs. As a conservative forecast, we evaluated the extent to which valuing the distribution-scale benefits of DERs would increase the cost-effective magnitude of deployment for both energy efficiency and demand flexibility. We find that increased cost-effective DER deployment and demand flexibility, enabled by valuing distribution benefits via NWS, would lead to approximately 6% greater CO_2 savings compared to the case in which distribution benefits are not valued in cost-benefit analysis. Combining that finding with the sensitivity analysis described above suggests that enabling distribution system revenue via NWS, scaled nationally, could avoid approximately 300 MT CO_2 over an assumed 20-year lifetime of DER assets.

Section 1: Best Practice Framework

To help scale the NWS market, we have identified three key elements that are critical for creating and sustaining successful NWS programs: establishing a supportive regulatory environment, integrating NWS into standard utility operating procedures, and creating a holistic process for NWS procurement. Each element is underpinned by a series of best practice recommendations listed below which, in the aggregate, create the necessary conditions to support the full life cycle of NWS deployment.

1. **Establish a supportive regulatory environment.** The regulatory environment, including rulings, precedents, and ongoing processes, is instrumental for enabling a scalable market for NWS in a particular jurisdiction. The regulatory framework at its best can elicit flexible responses from utilities and solution providers to ensure reliability and meet cost-reduction goals without being overly prescriptive.

Experience from non-wires solution projects across the US suggests that a supportive regulatory environment for NWS can:

a. **Leverage the legislature** to drive systematic consideration of NWS
b. **Provide an appropriate incentive structure** to encourage utilities to pursue NWS projects
c. **Clarify screening and evaluation criteria** to efficiently identify and assess NWS opportunities
d. **Enable data transparency** and access for solution providers
e. **Encourage DER forecasting** to identify potential low-cost NWS that could take advantage of organically-adopted DERs
f. **Support collaborative stakeholder processes** to allow for input into NWS processes from all interested and affected stakeholders

2. **Integrate NWS into standard utility operating procedures.** Processes and organizational structures within utilities can either facilitate or act as barriers to NWS-oriented planning and procurement. Advanced utility processes can allow for the fair comparison of NWS against traditional solutions and encourage the effective engagement of external market participants to best meet regulatory and utility-level objectives.

   Utility experience in non-wires solution projects suggests that a well-designed set of organizational processes within a utility can:

   a. **Consolidate accountability for non-wires and traditional solutions** within a single interdisciplinary utility team to facilitate fair assessment between different approaches
   b. **Allow for both utility- and provider-led integration** of diverse technologies to meet grid needs
   c. **Scale successful non-wires solution pilots to scaled deployment** to maximize learning and provide the greatest economic benefit

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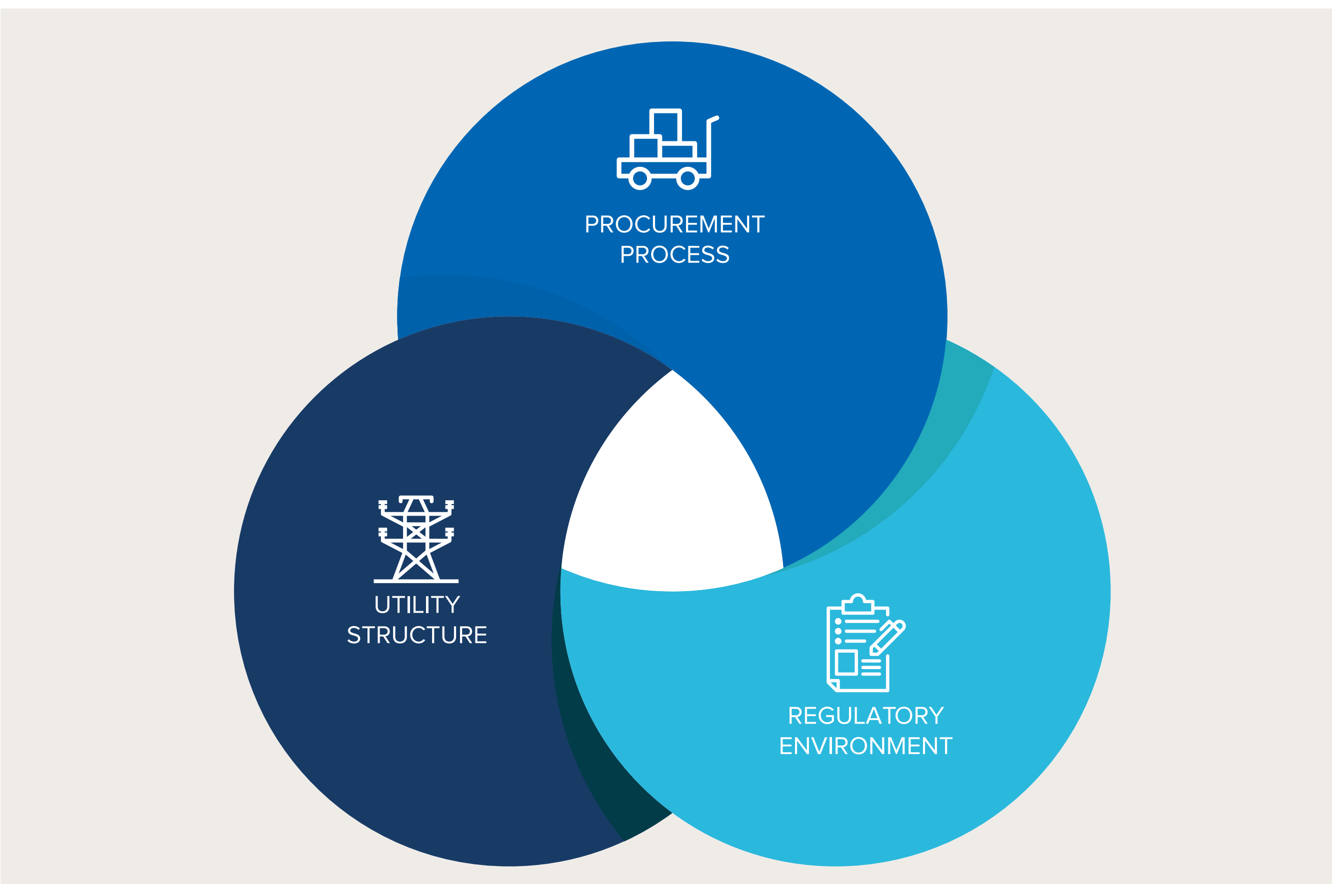
FIGURE 2
BEST PRACTICE FRAMEWORK



3. **Employ a holistic process for non-wires solution procurement.** Well-designed procurement practices can help ensure that opportunities to offer solutions are made available to the market in an efficient and fair manner that enables effective proposal development.

   Utility and solution provider experience to date suggests that procurements should consider the range of options for sourcing NWS, including pricing and expansion of customer programs, in addition to dedicated procurement via competitive solicitation. Since competitive solicitations have historically been a predominant sourcing mechanism used for non-wires solution projects, the Playbook focuses on two key sets of recommendations to improve solicitation practices:

   1. **Process enhancements** for the methods by which non-wires solution solicitations are developed:
      a. **Engage developers and other stakeholders** throughout the procurement process
      b. **Consider the role of third parties** in procurement

   2. **Best-fit technical approaches** for developing the content of an RFP to maximize the probability of receiving technically feasible and cost-competitive results:
      a. **Provide data-rich needs descriptions** for the solutions being requested
      b. **Elaborate performance attributes for solutions** rather than technology requirements
      c. **Provide clear proposal evaluation criteria** as part of the solicitation
      d. **Keep options open for further DER market evolution**, including wholesale market participation and/or distribution-level service pricing
      e. **Lay out clear requirements in project contracts** to fairly allocate risk and ensure operational reliability

The Playbook's recommended best practices can be implemented in any utility context

While the Playbook cites many examples drawn from non-wires solution experiences in New York and California, the recommended best practices are applicable nationwide. Because every jurisdiction will need to adapt these recommendations to suit local circumstances, we provide guidance on how these recommendations can be applied in different contexts. The following table outlines the key considerations for implementing the framework recommendations in three archetypical market structures: vertically integrated investor-owned utilities (VIU), investor-owned utilities in restructured states (wires-only utility), and consumer-owned and nonprofit utilities.

FIGURE 3

SUMMARY OF MARKET-SPECIFIC CONSIDERATIONS FOR BEST PRACTICE RECOMMENDATIONS

RECOMMENDATIONS	VERTICALLY INTEGRATED UTILITY	WIRES-ONLY UTILITY	CONSUMER-OWNED AND NONPROFIT UTILITIES
	• VIUs own transmission, distribution, and generation and traditionally earn a regulated rate of return on prudently invested capital.	• Wires-only utilities own distribution assets (not generation) and earn a regulated rate of return based on their cost of service.	• Consumer-owned and nonprofit utilities do not seek to earn a return for shareholders. Their rates are not typically regulated by state agencies but are overseen by boards or city councils.
REGULATORY	• Support performance-based ratemaking • Provide guidelines for screening and evaluation • Engage in stakeholder processes		• Develop internal criteria • Align utility executive and customer interests
UTILITY	• Internal expert team • More likely to serve as solution integrator	• Limited ownership of generation • Utility or third-party integrator	• Leaner internal team • More likely to have third-party integrators
PROCUREMENT	• Institutional expertise	• Less experience with generation and interaction with wholesale markets	• Encourage competitive participation • May need to address self-generation caps

Section 2: Implementation Guidelines

After detailing the best practice frameworks for developing robust NWS programs, we turn from outlining enabling conditions to providing practical guidelines that regulators and utilities can adopt to procure NWS projects at scale. This section includes detailed considerations for four central elements underpinning the successful implementation of NWS:

1. **Screening Criteria**
   Traditional planning processes can better support NWS if screening criteria are used to determine when NWS should be considered for a given need. Planners can apply criteria related to need characteristics like cost, timing, and type to screen if a non-wires solution project is likely to be viable. This screening encourages productive market engagement by helping utilities and developers efficiently allocate resources to the best non-wires solution opportunities. While a helpful prioritization tool for a nascent non-wires solution market, as utilities gain more NWS experience screening criteria can evolve to be more inclusive of a wider universe of potentially viable NWS.

2. **Competitive Solicitation Processes**
   Once a decision has been made to pursue NWS through a competitive solicitation, the RFP should be designed to maximize the number of technically acceptable, cost-effective bids. For decades, utility procurement departments have run solicitation processes for traditional assets, but non-wires solution solicitations require new and different considerations. To scale this market, it is important that solicitations are drafted with appropriate specificity, flexibility, and transparency. For example, solicitations should describe problems in terms of system needs, and solutions in terms of required performance attributes. They should also provide respondents with detailed participation instructions, clear evaluation criteria, and sufficient time to respond.

3. **Evaluation Frameworks**
   NWS represent a new type of procurement to solve critical grid needs. Since NWS may span traditional lines of supply, demand, and infrastructure, they require a well-considered comprehensive evaluation methodology. Evaluation must consider both the technical ability of a non-wires solution to meet the grid need and its cost-effectiveness in doing so. Technology-specific risks associated with technical non-wires solution performance can be assessed at the project and portfolio levels, and can inform risk-mitigation strategies like operational contingencies that may be included in an overall portfolio evaluation. Traditional cost-effectiveness tests can more appropriately suit the non-wires solution context if adapted to evaluate portfolios of different resource types, use location-specific data, and include all the benefits that NWS can provide. Finally, providing the market transparency into specific evaluation methodologies would support more effective bid development.

4. **Contracting Considerations**
   Utilities have a long history of contracting for third-party services and are able to draw on those precedents when negotiating terms with third-party owners of NWS projects. To a large extent pro forma non-wires solution contracts can mirror existing utility documents. However, there are four key areas—dispatchability, payment, performance, and construction—that require the most attention to effectively adapt standard contract clauses to the non-wires solution context. These adjustments are necessary because risk profiles for certain non-wires solution technologies differ from traditional grid infrastructure. Since the non-wires solution market is not yet mature, there is no broad agreement on how these risks should be allocated, and the lack of consensus slows down the negotiation process between utilities and developers. This section outlines the provisions that require the most modifications from typical utility contracts to accommodate the non-wires solution

context. In addition, it identifies certain market solutions to the risk-balancing exercise between utilities and developers that can be adopted across technologies, as well as some technology-specific considerations.

Conclusions

The market for NWS is nascent but represents a promising opportunity for reducing customer costs and enabling a lower-carbon electricity grid. With the increase in spending on distribution infrastructure, there is a pressing need to turn to approaches like NWS to minimize the impact on customer bills. At the same time, NWS can unlock additional value from DERs while both reducing net system costs and promoting the cost-effective deployment of resources that are important for reducing CO_2 emissions.

Non-wires solutions are thus a key priority for near-term action and can help lay the groundwork for future opportunities to scale the market for DERs as a core component of cost-effective grid infrastructure. Pursuing NWS today can help to further develop best practices, highlight the most valuable opportunities for non-traditional solutions, and prove the case for a more uniform, comprehensive market for NWS in the future. Specific opportunities exist in a few key areas:

- **Enabling the transparent and equitable valuation of location-specific services.** Pursuing NWS today can shed light on how locational value can most efficiently be made transparent and accessible to DERs through programs that encourage procurement of DERs where they can provide the most value (e.g., New York's Value of Distributed Energy Resources proceeding or other tariff-based approaches). Experience in the near term can also inform the development of practices to address equity issues with geo-targeted pricing or programs to ensure customer understanding and satisfaction, even if neighbors may be faced with different rates or program options.
- **Identifying and expanding the range of services NWS can cost-effectively offer.** Early experience with non-wires solution projects can test the range of distribution needs that NWS can address, fostering innovation while avoiding duplicity of pilots. Results of early projects can inform predictions of the cost-effectiveness of non-wires solution opportunities, so that projects can be screened more accurately for commercial viability.
- **Testing the relationship of NWS with related utility and regulatory reform efforts.** Emerging NWS portfolios across the US relate directly to broader grid modernization efforts, including integrated distribution planning proceedings and the concept of independent distribution system operators. Further pursuit of NWS within these broader efforts can highlight how planning processes can consider NWS without requiring formal screening criteria, and how DER participation in wholesale markets may impact the non-wires solution deployment and performance as DERs are increasingly used to provide grid services at multiple levels of the grid.

Regulators, utilities, and technology or service providers all have a role to play in streamlining processes to enable a lower-cost grid. Experience to date has demonstrated a business case for NWS across a wide range of utility territories, available to be pursued by utilities and vendors if a supportive regulatory framework is in place. *The Non-Wires Solutions Implementation Playbook* lays out best practices and provides practical guidance for developing key elements needed for implementation. It also highlights areas for future exploration as the market evolves. To further scale NWS by proving out the broader case for its application, there is a pressing need for more coordinated efforts to build on the lessons learned and find least-cost, best-fit solutions and processes that work across the wide variety of utilities and states that stand to gain.

ENDNOTES

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