IESO York Region Non-Wires Alternatives (NWA) Demonstration Project and Innovation and Sector Evolution White Papers

Stakeholder Feedback & IESO Response from December 12th Webinar.

Following the December 12th webinar outlining the concept design of the IESO York Region Non-Wires Alternatives (NWA) Demonstration project (the "demonstration") and the white papers titled NWAs using Energy and Capacity Markets (the "NWAs Using Markets" white paper) and Development of a Transmission-Distribution Interoperability Framework (the "T-D Interoperability" white paper), the IESO invited stakeholders to provide comments and feedback on the draft white papers and specifically on the design of the demonstration project.

The IESO received feedback from:

- CanSIA on behalf of NEXUS members
- Electricity Distributors Association
- Enel X
- Energy Storage Canada
- Grand River Energy
- Hydro One Networks Inc.
- Power Workers Union
- Storage Power Solutions

This feedback has been posted on the Innovation and Sector Evolution White Paper Series Engagement Webpage.

Note on Feedback Summary

The IESO appreciates the feedback received from stakeholders. The feedback has been noted and will be considered in order to shape the design for the demonstration project, including processes, timelines, resource eligibility, and service agreement of the demonstration. The IESO has provided a summary table below, which outlines feedback or questions for which an IESO response was required at this time and is organized by themes to manage length and usefulness of this document.

Stakeholder comments and IESO responses

Topic	Feedback	IESO Response
Maximizing Participation in Demonstration Auction	**Long Term Revenue Streams** Stakeholders suggested that increasing investor confidence in longer term revenue streams beyond the pilot's 2022 commitment period would increase participation. Specifically, while a variety of facilities are eligible to participate, there is lack of clarity around the longer-term revenue streams for these facilities. Additionally, it was recommended to provide a contract length which allows for the opportunity to recover investments and economically evaluates the DER against wire alternatives over the same time horizon. Stakeholders inquired as to whether there are plans to allow Distributed Energy Resources (DERs) that participate in the demonstration into other IESO procurements/programs or provide alternative compensation at the end of the pilot period. Additionally, it was asked whether following the 2022 commitment period the DER would be eligible to participate in the IESO's Capacity Auction?	**Long Term Revenue Streams** As the IESO York Region Non-Wires Alternative (NWA) Demonstration project is being undertaken under Natural Resources Canada's (NRCan) Smart Grid Program, with the project being funded by both NRCan and the IESO, the demonstration must abide by funding timelines. As such, the demonstration will conclude in 2022. As per the demonstration concept design, while demonstration participants are ineligible from participating in the IESO administered markets (IAMs) simultaneously with the demonstration, they are eligible to participate simultaneously with the Industrial Conservation Initiative (ICI). Further, participants are eligible to participatein the IAMs where commitment/obligation periods do not overlap. In other words, given that the demonstration involves two six-month summer commitment periods (that align with the definition of the summer commitment period in the IAMs), participants would still be eligible to participate in IAMs (including the capacity auction) during winter commitment periods. Similarly, participants would be eligible to participate in the IAMs following the conclusion of the demonstration project. The purpose of this design decision is to prevent potential "double

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		dipping" or overcompensation for the value of services provided by the DERs, considering that the demonstration project will notionally compensate participating DERs for both their local and wholesale value, consistent with the Total Independent Distribution System Operator (IDSO) model adopted in the demonstration.
	Participation of LDC owned DERs Some stakeholders recommended including DERs owned or operated by Local Distribution Companies (LDCs) or LDC affiliate companies so long as they are not related parties to the Independent Distribution System Operator (IDSO) or host LDC. Stakeholders suggested including DERs owned or operated by LDCs or LDC affiliate companies would increase competition and thus reduce procurement costs.	**Participation of LDC owned DERs** The demonstration project team is in agreement that DERs owned and/or operated by Local Distribution Companies (LDC) affiliates that are unrelated to the host LDC (i.e. Alectra Utilities as the IDSO in the demonstration) will be eligible to participate. IESO notes that further analysis and understanding of the potential impacts on market prices, competition, and consumer cross-subsidization (e.g. of an LDC's customers and wholesale customers, or between the customers of different LDCs) of the participation of ratebased DERs in electricity markets is needed in order to inform potential future rules for the treatment of ratebased assets.
	Additional Information Requested Stakeholders requested that clear and transparent rules for the auction, including the draft contract documents be posted well in advance of the RFP/auction. Additional details were requested with regards to the precise commercial	**Additional Information Requested** The webinar presented a 'concept design' for the demonstration to solicit stakeholder comments in advance of detailed design work to better reflect this initial feedback. The service agreement and local capacity auction process documents are under development now

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	arrangement between the IESO, IDSO, host LDC and DER owner & operator. Specifically, the obligations of each party, performance requirements, penalties for non-performance, etc., that would be applicable to all parties. It was requested that the IESO provide more specific information with respect to the Distribution Locational Marginal Pricing (DLMP) algorithm that would be applied. Clarity was also requested on whether all DER participants would be eligible for energy payments resulting from DLMP. To ensure competition can be maximized and efficiency is achieved, it was recommended that the IESO/Alectra share the breakdown of load in the region. Once capacity has been awarded in the auction, all participants with a supply obligation should be given the list of customers for the region as is done in other jurisdictions with similar programs.	and will be shared with stakeholders in Q3 2020 for further feedback in advance of the demonstration's local capacity auction, which is to take place in Q4 2020. Further, a public webinar will be held on distribution locational marginal pricing (DLMP) to inform stakeholders on some of the concepts behind the demonstration's proposed energy price formation in late Q1 or early Q2 2020. The details of the demonstration's settlement will be outlined in the participant Service Agreements, which will be posted in draft for stakeholder feedback in advance of the demonstration's local capacity auction. It is understood that information about the load, such as a statistical breakdown of customer classes in the demonstration area, supports business development activities and the ability to participate in the demonstration. The IESO and Alectra will explore the information that can be provided as part of further development of the demonstration in Q1-Q3 of 2020. Consideration will have to be given to confidentiality restrictions and the typical processes associated with capacity and energy markets, which is the approach adopted in the demonstration (as opposed to other "business models" adopted in other projects or jurisdictions).

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	Removing Unnecessary Barriers to Entry Participation in the demonstration auction can be maximized by removing any unnecessary barriers to entry, including auction fees which may be onerous for small developers and aggregators.	**Removing Unnecessary Barriers to Entry** Thank you for the feedback – the project team generally agrees and will bear this comment in mind as the demonstration is further developed.
Challenges and Opportunities to the Adopted T-D Model	**Evaluation of Alternative T-D Models** Stakeholders recommended that additional T-D models and procurement approaches be trialed and evaluated following this demonstration project. Stakeholders cautioned that the results of this pilot must be interpreted cautiously so as to not bias future selection of appropriate models for the Ontario market.	**Evaluation of Alternative T-D Models** As noted in the demonstration concept design webinar, this demonstration project is exploratory. The T-D model selected for trial in this demonstration is one of many alternative models, as investigated in the T-D Interoperability white paper. Given the finite funding, staff resources, and time, the demonstration can only focus on one T-D model. However, IESO is currently enagaged in other demonstration projects that have adopted other models, including several funded through the Grid Innovation Fund. For some examples, please refer to Opus One Solution's Smart Energy Community Microgrid Project, NRStor's Local Distributed Energy Resource (DER) Integration and Rental Program Pilot, and Opus One Solutions Transactive Energy Network. IESO will work with project proponents to publicly share lessons learned from these projects as they progress. IESO welcomes opportunities to test and support the detailed exploration of additional models in the future.
	Need for Market Rule Amendments Stakeholders questioned whether the IESO is	**Need for Market Rule Amendments** The IESO will not be implementing market rule

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	required to implement Market Rule amendments to enact this demonstration?	amendments for the purpose of this demonstration. Demonstration parameters, obligations, participation rules and guidelines, including processes and timelines, will be developed and set out in demonstration-specific documents. However, as outlined in the demonstration concept design, one of the objectives of the demonstration is to identify and explore what IESO process changes would be needed to enable an IDSO model, if pursued in the future, including potential market rule changes.
	Challenges to Adopted T-D Model It was noted that one of the challenges is the ability to send appropriate signals to the market in the absence of a fully functional capacity market and the absence of locationally-based marginal prices at a distribution level.	**Challenges to Adopted T-D Model** With the Market Renewal Program (MRP), the IESO is introducing fundamental reforms to Ontario's electricity markets to improve how electricity is supplied, scheduled and priced to meet Ontario's future needs, including the introduction of locational marginal prices (LMP) at the transmission level of the system. In addition, the IESO is proposing to adopt a phased approach to introduce and evolve the capacity auction in the IAMs. A key objective of the demonstration is to test a local capacity auction and DLMP in order to support interoperability across the T-D interface and to generate more granular price signals that reflect both the local and system level needs.

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Demonstration Timelines	**Timeline for Release of Program Rules and Contracts** Stakeholders recommended the IESO establish a clear plan for the consultation of the draft program rules and contracts as it will be important to establish a clear understanding of performance requirements and participation risks in order to increase investor confidence. A stakeholder suggested that providing the draft contracts, rules, and requirements earlier would be beneficial. Another stakeholder suggested the timelines were aggressive and recommended delaying the auction to Q2 2021. **Timelines for Project Development** Stakeholders suggested lengthening the lead time for project development to ensure that there are	**Timeline for Release of Program Rules and Contracts** The participant service agreement and local capacity auction process documents are currently under development. Once developed, the documents will be shared in Q3 2020 and a public engagement to seek feedback on the draft local capacity auction process and service agreement materials will be held in advance of the demonstration's local capacity auction in Q4 2020. The purpose of having two local capacity auctions with two six-month commitment periods is to increase the learnings of the demonstration. In addition, the flexibility of annual local capacity auctions as a mechanism permits year-over-year adjustments to the target capacity sought, which can reflect the year-over-year changes in demand in the local area. With this approach, the target capacity can be defined annually to negate or 'cancel out' the load growth and secure sufficient DER capacity to be able to maintain the net load in the local area below the limits of the network infrastructure being deferred. Moreover, with this approach, the demonstration will provide a second opportunity for potential participants who were not ready to participate in the first local capacity auction, thereby increasing participation and learnings potential. **Timelines for Project Development** As the demonstration is being implemented under NRCAn's Smart Grid Program, it must abide by the

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	multiple projects of various technologies, resulting in more competitive bids and a more robust opportunity for study. It was suggested that if a resource requires capital expenditure, and needs to go through a connection impact assessment process, such as behind-the-meter battery energy storage systems (BESS), it may not be installed in time for the commitment period. For capital intensive DERs, developers need approximately 9-12 months to site, receive approvals and install projects. If the proposed timelines remain, then it was recommended that projects in the territory that receive an obligation be 'fast-tracked' and right sized through the connection process to ensure readiness for May 1st 2021.	Program's timelines, under which the project must be completed in 2022. It is anticipated that the demonstration will involve material participation from existing resources or resources already under development. For new DER installations with longer lead times that do not meet the timelines of the first local capacity auction, there may be an opportunity to participate in the second auction.
	Timeline for Integration with Wholesale Market A stakeholder suggested that while it is important to simulate the results and benefit to the wholesale market prior to full implementation, the simulation period should move to integration with the wholesale market as soon as practical.	**Timeline for Integration with Wholesale Market** Thank you for the feedback – as also discussed in the webinar, the project team will investigate actual participation in the wholesale market as part of a latter phase of the demonstration project. While actual participation in the wholesale market as part of the demonstration project would result in valuable additional learning, it would need to be balanced against the added cost, complexity and risks, especially if it will involve changes to the IESO's systems, processes, and

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		market rules, which would be challenging to justify for a demonstration project.
Eligibility Requirements	**LDC Eligibility** It was suggested the restriction on LDC eligibility to participate will reduce competition and lead to increased procurement costs. It was also stated that a restriction on LDCs and their affiliates to access revenue streams from this program is punitive and not representative of fair trade and open access to markets. It was suggested that there is an ownership role for the LDC, particularly in "owning" dispatch rights of a third-party owned asset. Without sufficient incentive and ability for an LDC to earn a reasonable rate of return, there will be a continued unconscious bias by LDC's to favour a wires alternative over NWA options. **Demonstration Area** A stakeholder suggested including all customers within the York Region to fully maximize the learning opportunities, given that this is a "York Region" demonstration project.	**LDC Eligibility** As stated above, the IESO clarifies that DERs owned and/or operated by LDC affiliates that are unrelated to the host LDC will be eligible to participate. A major consideration with distribution-level markets is transparency and fairness. To avoid actual or perceived conflicts of interest in operating a market, DSOs will need a necessary degree of independence from other distribution system functions, such as DER ownership, as well as from any other profit motives associated with operating the market (as is the case at the wholesale level in Ontario). The model adopted for the demonstration includes an Independent DSO (IDSO), which will serve as a neutral market operator, similar to the market and system operations at the transmission level. **Demonstration Area** The demonstration is being conducted in southern York Region given that it is an area where regional planning has identified anticipated future needs. To ground the demonstration in reality, the IESO is working with Alectra Utilities to simulate that anticipated need in the demonstration. The demonstration is in part being

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		conducted in an effort to develop new mechanisms and explore the potential to reduce costs and find affordable alternatives to building new transmission infrastructure. Further information on the needs in the demonstration area can be found on the York Region Integrated Regional Resource Plan website. In addition, given the fixed amount of funding and the nature of the project - to test and demonstrate interoperability across the T-D interface to support DERs used as NWAs - the project will be limited to several identified transmission stations.
	Revenue Stacking A stakeholder questioned the lack of ability to be able to participate in the IAMs as well as the demonstration. The ability to 'stack' revenues and values ensures an efficiency for the resource, as well as the system operator. Similar 'pilots' such as Con-Ed BQDM have allowed resources to participate in the utility market as well as the NYISO administered markets.	**Revenue Stacking** As discussed in the webinar, there are two ways in which DER participating in the demonstration will have the ability to stack revenues. First, participating DER will provide demonstration local and wholesale energy and capacity services. Second, DER participating in the demonstration will be able to participate directly in the IESO's IAMs for time periods where the commitment/obligation periods do not overlap. These design parameters balance the desire to stack multiple revenues while avoiding duplication of compensation. For clarity, DERs that are participating in the demonstration's two six-month summer commitment periods are welcome to participate in the IAMs during other periods that do not overlap with the demonstration's commitment periods.

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	Rules for Hourly Demand Response A stakeholder urged the IESO to finalize the rules used for Hourly Demand Response and to resolve key issues that will impact future markets ensuring the rules are neutral between all technology types.	**Rules for Hourly Demand Response** The demonstration will have separate rules and processes from those of the IAMs. However, instead of 'reinventing the wheel', the intent is for the demonstration is to leverage as many of the concepts and processes from the Hourly Demand Response participation model in the IAMs as possible. This alignment would also enable more streamlined T-D interoperability (as opposed to having local market processes that are misaligned with wholesale market definitions, systems, and processes). Additionally, the Hourly Demand Response participation model and process is one that demand response providers and other potential demonstration participants are already familiar with, which has the potential to reduce some of the administrative time and cost associated with potential participants needing to familiarize themselves with the processes used in the demonstration.
	Questions to Clarify Eligibility Requirements Will multi-resource DERs be eligible for participation? (e.g. storage-paired solar PV)? IESO mentioned that eligibility of IESO-contracted dispatchable DERs will be reviewed on a case-by-case basis. Will further information be provided as to what specifically the evaluation of eligibility	**Questions to Clarify Eligibility Requirements** Multi-resource participation (e.g. solar plus storage) is expected to be permitted in the demonstration as demand response, provided that the DERs are connected behind-the-meter. Eligibility with regards to existing 'merchant' DERs or existing IESO-contracted DERs will generally be based on

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	will be based on? It is unclear why previously constructed non-dispatchable DERs are ineligible to participate, while existing dispatchable DERs might be eligible. For example, if there is an existing net metered facility, could it be upgraded with storage and become eligible to participate? Has the IESO identified any size requirement/constraints for individual participating DERs? Has the IESO identified any constraints or targets with respect to the number of participants that it would seek to award capacity obligations to? Does the IESO have a vision for how aggregation of small assets (i.e. DERs <100kW as classified in concept design) will occur?	the principle of DERs making incremental contributions to meeting local needs. As discussed in the webinar, planning needs identified for York Region are based on forecasts that are already inclusive of the contribution of contracted distributed generation. However, our analysis shows that the operation of existing dispatchable DERs that are currently being operated on the basis of 'signals' such as the Hourly Ontario Energy Price (HOEP) or coincident peaks as part of the Industrial Conservation Initiative (ICI), do not fully reflect the local needs. The periods where the loading in the demonstration area peaks do not necessarily coincide with system-level peaks. If dispatchable DERs receive a new, local signal, such as the demonstration's dispatch instructions and DLMP, the DERs would operate in a new, valuable manner that they otherwise would not have had. This new operation and output is not captured in the current planning forecasts and would represent incremental value. Existing non-dispatchable DERs, on the other hand, do not have the same ability to provide incremental, value-add energy production. With respect to existing, dispatchable IESO-contracted DERs, we invite potential participants to contact us so that we can assess if and how they could participate in the demonstration given the terms and conditions of their contracts.

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		With regards to DER size for participation, DERs with capacity ≥100 kW are eligible on a stand-alone basis; DERs <100 kW are eligible on an aggregated basis, including aggregated residential DR. The methodology for aggregations in the demonstration is under development. As well, the addition of a maximum capacity size to the eligibility requirements is being considered to ensure the inclusion of several participants in the demonstration (as opposed to one participant being awarded the total capacity target). Further details will be shared with stakeholders as part of the detailed design of the demonstration throughout Q1-Q3 2020.
Other Issues Important to the Success of the Demonstration	**Defining Evaluation Criteria** Stakeholders outlined that prior to running the demonstration, the IESO should publicize information with respect to evaluation criteria and measures for success. How does the IESO demonstrate that the NWA model resulted in overall reduced costs for customers, or other improved outcomes? A stakeholder questioned whether cost recovery and rate impacts of the demonstration project would be evaluated?	**Defining Evaluation Criteria** As discussed in the webinar, the objectives of the demonstration are to explore: • Use of DERs as non-wires alternatives • Use of market constructs to secure and operate DERs for local needs • How a distribution-level and transmission-level market could be interoperable • Process changes needed to enable an IDSO model, if pursued in the future The demonstration will primarily be evaluated against these objectives. Specific metrics include the degree to which:

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		• participants comply with dispatch instructions • dispatch of DERs aligns with local and system level need • T-D interoperability and IESO's visibility into distribution operations is improved • potential process changes needed to enable an IDSO model are identified Price discovery is not a primary objective of the demonstration, but the project may provide some secondary findings in this regard as well.
	Integration of IDSOs in the IAMs It is important to demonstrate the IAM can integrate IDSOs. This is a primary barrier to fully integrating DER's and extracting full value to the benefit of the rate payer. **Multi-Service Framework** A stakeholder suggested the IESO further explore in the demonstration how it could help inform the development of a Multi-Service Framework which would allow resources the ability to provide all electricity services (energy, capacity, ancillary) that they are technically capable of providing. It was suggested that the demonstration could help highlight what regulatory or technical barriers need to be overcome to fully develop the ability for resources to provide multi-services.	**Integration of IDSOs in the IAMs** A key objective of the demonstration project is to facilitate interoperability across the T-D interface in order to demonstrate the integration of an IDSO with the wholesale level market and system operations. **Multi-Service Framework** The project has been carefully scoped in order to focus on materially advancing the T-D interoperability concepts and mechanisms. The demonstration is focused specifically on energy and capacity, including how the two services can be combined or "stacked" at the distribution and transmission levels of the system. Treatment of ancillary services is not within scope of the project.

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	A stakeholder questioned whether there are plans to use the demonstration to identify the potential for DERs to provide other ancillary benefits? Similarly, a stakeholder suggested that IESO look at other benefits of DER beyond capacity and energy (e.g. ancillary services) that should be considered in the cost-benefit analysis for NWAs, with the cost-benefit analysis being available to the public.	
	Regulatory Incentive Mechanisms The IESO was encouraged to work with LDCs and the OEB to develop appropriate regulatory incentive mechanisms for LDCs to participate and encourage NWAs.	**Regulatory Incentive Mechanisms** The IESO is engaging with stakeholders, including LDCs and the OEB, as well as others across the electricity sector with regards to DERs and sector evolution as part of several initiatives that are underway. However, regulatory barriers and incentive mechanisms are out of scope for this demonstration.
	Consideration of Other Procurement Mechanisms Stakeholders encouraged the IESO to explore the potential for alternative procurement mechanisms consistent with the IESO's consultation on resource adequacy. For example, longer-term, competitive RFPs where resources are known to be needed for a lengthier period. Stakeholders questioned whether there were plans to consider the demonstration of alternative procurement	**Consideration of Other Procurement Mechanisms** Generally, it is expected that there will be particular interest and participation in the demonstration from participants with existing resources. Additionally, a key objective of the project is to specifically demonstrate the use of energy and capacity market constructs to secure and operate DERs for local needs. It is acknowledged that there are other approaches to DER procurement that are worth exploring as well. As part of the Grid Innovation Fund, the IESO is currently supporting other projects that

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	mechanisms beyond the construct of energy and local capacity auctions. It was recommended that the IESO review the financial parameters of the Con-Ed BQDM projects. If the IESO expects capital intensive projects to participate such as BTM BESS or non-dispatchable DERs, then it may be more appropriate to use an up-front compensation model that allows capital-intensive projects to competitively bid. **Review of Secondary Market Structures** The IESO was encouraged to explore secondary market structures such as the Value of DER tariff currently employed by Con-Ed. This tariff specifies a tariff-based value – often based on prevailing market rates – which allow the further expansion of DERs up to a defined capacity limit in localized networks.	have adopted other T-D models. The IESO welcomes additional opportunities to test and support the detailed exploration of other models in the future. **Review of Secondary Market Structures** While there is merit to Value of DER tariffs, these typically include compensation methods that do not fully capture the dynamic nature of electricity system needs. DERs such as battery storage will need to be managed more actively in order for them to provide value as NWAs and operate when needed and valuable, i.e. when local demand is expected to be high and exceed limits of transmission and/or distribution infrastructure. In other words, by using dispatch instructions and DLMP, the demonstration provides more dynamic incentives and operating instructions than tariffs typically offer.
NWA Using Markets White paper	**Aggregation of Different Resource Types** Other system operators have explored the ability to aggregate resources of different types in the	**Aggregation of Different Resource Types** Aggregation of DERs will be eligible and encouraged to participate in the demonstration. With respect to market

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	capacity market (such as variable generation sources like wind and solar with DERs or with Demand Response). Exploring this type of market participation further could lead to an increased participation of DERs in the Ontario IAM and local markets.	participation models that involve mixed resource aggregations, we invite stakeholders to review the IESO's "Distributed Energy Resources: Models for Expanded Participation in Wholesale Markets, Part 1" white paper, which can be found on the Innovation and Sector Evolution White Paper Series webpage. Further to Part 1, the IESO is currently developing Part 2 "Options for Enabling DER Participation" for which the most recent webinar presentation is avialable on the website.
	Distribution Locational Marginal Pricing (DLMP) The NWA Using Markets white paper defines the LMP as the marginal price of providing one additional MWh of energy at a particular pricing node but, provides no example or definition of what a pricing node would look like at the distribution level. Would the pricing node be the level of a distributor's overall service territory, at each distribution station or does the IESO envision a circumstance where DLMP would be provided down to the individual feeder level? It was suggested that as a principle, the benefits of increased granularity in locational pricing should always be balanced against the complexity and cost associated with enabling that functionality. It was suggested that the IESO update the draft NWA Using Markets white paper to include	**Distribution Locational Marginal Pricing (DLMP)** The NWAs Using Markets paper provides a conceptual discussion of DLMP. From this perspective, distribution nodes could in theory be introduced anywhere at the distribution level where there is a desire to generate more granular prices. However, from a practical perspective, if and when DLMPs are first introduced, nodes closer to the transmission system that reflect constraints associated with larger network infrastructure equipment and that capture a larger area of the distribution system would be the natural starting point. This would help ensure that there is sufficient market participation at the DLMP node to generate efficient prices. In line with this notion, for the demonstration, IESO and Alectra are investigating the use of two distribution-level nodes on the low-voltage side of the T-D interface that would extend granular prices into the demonstration area. With respect to examples of DLMP having been implemented, we are

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	specific examples of DLMP implemented in other jurisdictions. It was noted that the paper puts forward that a pricing approach for NWA could be constructed at a DSO level with DSO-level capacity markets, energy market and ancillary services. While it may be possible, the proposed market/pricing approach does not take into account the following issues: (1) A bi-annual "DR" auction will not provide any meaningful contract life to allow non-wire projects to satisfy project financiers on revenue certainty to allow a reasonable return on investment. In comparison, a wires project can be recovered over a much longer time frame. This sets up for inequity in treatment and evaluation of wires and non-wires investments. (2) It was suggested that zonal capacity prices may undervalue specific constrained assets at the distribution level which could be evaluated as a NWA if there is insufficient locational granularity of pricing. Instead, it was recommended that the appropriate valuation for NWA should be based on sound asset management and economic benefit/cost principles. In this the non-wires alternative would be directly compared to the wires option in determining the preferred asset strategy.	unaware of any jurisdiction that has introduced DLMP, which is one of the key aspects of this demonstration that makes it novel and informative. With regards to the three issues noted: (1) The length of commitments and revenue certainty, including the balancing of risks borne by resource providers and load customers, are important market design parameters. One of the benefits of employing NWAs is that they offer flexibility in terms of when they are deployed/secured and what services they provide. For the purposes of the demonstration, the intent is to test a capacity market construct with relatively short commitment periods. For a more general discussion on the issue of length of commitment, kindly refer to the Resource Adequacy Engagement web page, where the IESO will be seeking feedback from stakeholders about what tools are needed in addition to capacity auctions to achieve required levels of resource adequacy. (2) The NWAs Using Markets white paper proposes the use of capacity zones that are granular and allow for the value of the specific network assets being deferred to be reflected. The white paper also contemplates the use of an integrated planning process to identify whether the use of DERs as NWAs is the more economical option to meeting system needs. Ontario has a longstanding practice of using

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	(3) It is unclear why ancillary services were taken out of scope for consideration as ancillary services provide an important component of value stacking for DER's and should be brought back into scope. The IESO was encouraged to establish overall net benefits of DERs beyond DERs being used to meet peak system needs, i.e. using DERs to meet non-peak system needs. It was suggested that as part of the design of the IDSO pilot project, the IESO should ensure a proper evaluation is conducted of the total system cost implications of the DER scenarios.	integrated planning, where a combination of potential solutions, including transmission and distribution network infrastructure, centralized resources, and DERs, are modeled over the planning horizon and assessed to identify the lowest-cost options. (3) The demonstration has been carefully scoped to focus the project and be able to materially advance the T-D interoperability concepts and mechanisms being explored. The demonstration is focused specifically on energy and capacity, including how the two services can be combined or 'stacked' at the distribution and transmission levels of the system. While it is acknowledged that ancillary services are an important component of the DER and NWA discussion, they have been scoped out of the project in order to maintain a focused and manageable demonstration project. Moreover, it should be noted that energy and capacity payments tend to represent a significant portion of the value that resources can provide, while ancillary services may not represent as significant a revenue opportunity. As one indicator, consider that while the IESO oversees and reconciles more than $18 billion associated with the IESO-administered markets, related services, programs and electricity charges, ancillary services represent less than $100 million of this amount. It should be noted

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		that this value only reflects transmission-level ancillary services, and that distribution-level ancillary services may present an additional opportunity. Regardless, the demonstration strategically focuses on energy and capacity services in order to "unlock" the most material value components of DERs used as NWAs. With respect to evaluating the overall benefits of DERs beyond their value as NWAs for local system needs, please note that the demonstration compensates DERs for both their local energy and capacity value as well as their wholesale energy and capacity value, as described in previous responses above. Additionally, for pilot DER projects, the IESO has developed a set of standardized DER test cases to assess the performance of DERs, including the provision of ancillary services. The issue of DER's ability to participate and provide services in the IAMs is generally being explored as part of the IESO's 'Exploring Expanded DER Participation in the IESO-Administered Markets' white paper series. Stakeholders are also encouraged to refer to the IESO's Regional Planning Review Process, which has the topic of

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		potential barriers to implementing non-wires solutions in regional planning within its scope.
Transmission-Distribution Interoperability White paper	**Coordination of Outages** A stakeholder raised concerns with any model which would limit the distributor's ability to plan and execute its outages and day to day work programs. It was suggested that the white paper would benefit from greater clarity regarding obligations to coordinate outages and work program execution between the distributor and the entity responsible for the dispatch of DER/ DSO. **Telemetry Requirements** The IESO was encouraged to consider the impact of additional telemetry requirements on the cost of DER project installations. Where possible, stakeholders encouraged the usage of shared frameworks for providing telemetry to system operators.	**Coordination of Outages** Thank you for providing this feedback. The IESO recognizes that outage/derate coordination is needed between the DSO and distributor, not just between the TSO/IESO and transmitter. Edits will be made to reflect this feedback in the T-D Interoperability white paper. **Telemetry Requirements** Overly stringent telemetry requirements could be prohibitive for smaller resources, increasing the cost for DERs to provide services. A discussion on this issue and other potential barriers is provided in section 8 of the IESO's Exploring Expanded DER Participation in the IESO-Administered Markets, Part 1 white paper, which was the first white paper of a two-part series. We invite stakeholders to participate in the engagement process for the second white paper (see recent webinar presentation), which will include more detailed examination of potential options to address barriers to DER participation in the IAMs. In terms of shared frameworks, further information is provided in section 6 of the T-D

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	LDC Consolidation The potential for further consolidation among distributors is not considered which may present other avenues to minimize duplication and complexity, while making a greater number of T-D interoperability frameworks feasible.	Interoperability white paper, which discusses the use of a shared market and operational coordination platform in more depth. **LDC Consolidation** LDC consolidation may have benefits for facilitating T-D interoperability. However, there are many other and perhaps more important policy considerations that relate to this issue, which are out of scope of the the T-D Interoperability white paper. As well, there are solutions such as software-as-a-service (SaaS) and the use of a province-wide common platform that could allow smaller LDCs to facilitate T-D interoperability at a lower cost than investing in their own separate operational systems. Further analysis would be required to better understand this issue, which, again, is not within the scope of the demonstration, T-D Interoperability white paper, or NWAs Using Markets white paper.
General Feedback	**Coordination with the OEB** Stakeholders recommend that the IESO coordinate with the Ontario Energy Board (OEB) to develop a common definition of DERs among other considerations to ensure alignment with concepts from ongoing OEB engagements and initiatives. Changes to roles and accountabilities of various sector participants may require changes to legislation, IESO rules and OEB codes, etc. and	**Coordination with the OEB** The IESO continues to engage with the OEB on issues related to DERs, including the Innovation and Sector Evolution White Paper Series in general. In particular, the IESO made oral and written submissions to the the OEB's consultations on "Responding to DERs and Utility Remuneration". The IESO is a also member of the OEB's DER Connections Review Working Group which will make recommendations to the OEB regarding

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	have far-reaching and unintended impacts. The first two steps of the decision making roadmap presented are the identification of system objectives and identifying which interoperability models are of interest to Ontario.	appropriate connection requirements, processes and timelines. The OEB has participated in each of the IESO's engagements on the Innovation Whitepaper series which includes research on various topics related to the integration of DERs into wholesale markets. The IESO and the OEB are also coordinating on research on consumer behaviours and preferences to understand the potential and pace for consumer deployment of DERs in Ontario. It should be noted that the white papers as well as the demonstration are exploratory in nature and do not represent commitments by the IESO to implement the concepts and mechanisms explored. As discussed in Section 7.2 of the T-D Interoperability white paper, it is suggested as part of next steps for Ontario to collaboratively define and set objectives with key Ontario stakeholders (e.g. LDCs, associations, OEB, and others). Coordination with the OEB on the subject matter of the white papers and the demonstration is valuable, and becomes even more important if and when DER-related initiatives progress to the point of being considered for broad-scale implementation.
	Cost-Benefit Analyses As a general observation it was noted that while the papers are instructive in identifying frameworks and concepts, they are supported by qualitative statements and assessments. All market	**Cost-Benefit Analyses** The IESO is in agreement that the frameworks discussed will introduce more complexity and will involve investment if and when implemented. Prior to the implementation of a major evolution in T-D interoperability or market constructs to facilitate DERs to

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	frameworks discussed within the white papers will introduce incremental complexity and require incremental investment to enable the identified functionality. It was suggested that any policy decisions should be made with supporting empirical, cost-based analyses before proceeding with implementation.	provide services, detailed assessments, including cost-benefit are expected to be needed. It is important to note that one aspect of the demonstration is evaluating the potential for existing resources to offset investments in new resources. Ontario currently has 4000MW of installed DERs under contract to IESO. Many other DERs have been installed for the purposes of the Industrial Conservation Initiatve. Many of these resources can currently participate in wholesale markets or be leveraged by LDCs to offset the need for investment in new infrastructure. A key consideration in any quantitative assesment of the benefits of NWAs (DERs) vs. traditional distribution and transmission infrastructure will be the potential benefit of enabling these existing resources – many of which are fully depreciated or have been largely paid for by individual consumers (rather than ratepayers – e.g. building automation systems capable of providing demand response) to provide distribution and wholesale services rather than investing in new infrastructure.
	Increase Emphasis on End-Use Customers While the papers provide some qualitative discussions regarding complexity, cost and reliability the focus appears to be primarily on market participants rather than end-use customers. It was suggested that greater emphasis should be placed on the outcomes experienced by	**Increase Emphasis on End-Use Customers** See comments immediately above under "Cost-Benefit Analysis". In addition, it is anticipated that some (if not the majority of) demonstration participants will be end-use customers (i.e. "prosumers"). As well, as discussed in the T-D

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	end-use customers from a reliability and affordability perspective. Ultimately, it will be those customers that pay market costs and the IESO should focus on seeking the outcomes that minimize cost and optimize the value to those end-use customers.	Interoperability white paper, robust interoperability in a high-DER future is essential for supporting system reliability, including for end-use customers. As noted in the NWAs Using Markets white paper, integrated planning processes investigate whether the use of NWAs is a cost-effective solution and would lower costs for all end-use customers, including by comparing to the cost of alternative traditional distribution and transmission infrastructure. Additionally, the IESO encourages stakeholders to visit the Innovation and Sector Evolution White Paper Series website to participate in the engagement process for the "Consumer Preferences, Choices and Behaviours Impacting Electricity Supply and Demand" white paper, expected to be published in Q2 of 2020.