

## Online Appendix - Survey text

*<text in brackets>* describes the conditional logic behind the questions shown

*"not asked in NY"* marks questions that were not shown to participants identified through the New York proceeding

1. Which of the following best describes your role?

- a) I represent my organization/clients in regulatory proceedings
- b) I analyze policy on behalf of my organization/clients
- c) I am in a supervisory or a decision-making position
- d) Other: \_\_\_\_\_

2. Which of the following describes your organization?

- a) Electricity customer or a representative of electricity customers
- b) Owner of distributed energy resources (DER), a representative of DER owners, DER aggregator, PV contractor or other DER-centered role
- c) Utility or a representative of utilities
- d) Organization centered around environmental protection
- e) Regulator
- f) Other (owner of transmission-level generation, competitive retail supplier etc.)

### **Customers block**

*<block of questions shown to those who choose answer a) in Q2>*

3. Does your organization/clients buy electricity directly from wholesale markets?

- a) Yes, it buys electricity in wholesale energy markets.
- b) No, my organization is solely a retail customer.

4. Do you agree that the future electricity sector policies, such as subsidy programs and emission pricing, are important for your organization/clients?

- a) Strongly agree
- b) Somewhat agree
- c) Neither agree nor disagree
- d) Somewhat disagree
- e) Strongly disagree

5. Has your organization/clients considered investing or already invested in distributed energy resources (DERs), such as solar PV, batteries, combined heat and power etc.?

- a) Yes
- b) No

6. What factors were important in your organization's/clients' decisions about DER investments? (Select all that apply)

*<show if answer to Q7 is "Yes">*

- f) Ability to hedge electricity price risk
  - g) Backup power
  - h) Organizational sustainability goals
  - i) State incentives
  - j) Other (please briefly describe important factors below):
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7. What information does your organization/clients need to decide whether to invest in DER? (Select all that apply)

*<show if answer to Q5 is "Yes">*

- a) Expected retail rates 1 to 10 years from now *<show if chosen answer b) to Q3>*
  - b) Expected wholesale energy prices 1 to 10 years from now *<show if chosen answer a) to Q3>*
  - c) Expected capacity market prices
  - d) Expected distributed energy resources tariffs
  - e) Expected grid mix
  - f) The waiting time in the interconnection queue or the interconnection cost
  - g) Hosting capacity
  - h) Distribution-level congestion
  - i) Transmission-level congestion
  - j) Emissions from the grid
  - k) Consumer demand
  - l) Other (please briefly describe desired information below):
- 

8. Of the kinds of information you listed as important for DER investment, what information is **easily accessible** for your organization/clients?

*<show only the options marked in Q7 as relevant>*

- a) Expected retail rates 1 to 10 years from now
- b) Expected wholesale energy prices 1 to 10 years from now
- c) Expected capacity market prices
- d) Expected distributed energy resources tariffs
- e) Expected grid mix
- f) The waiting time in the interconnection queue or the interconnection cost
- g) Hosting capacity
- h) Distribution-level congestion
- i) Transmission-level congestion
- j) Emissions from the grid
- k) Consumer demand
- l) *<option typed in as "Other" in Q7>*
- m) None of the above

9. Of the kinds of information you listed as important for DER investment, what information is **not accessible** for your organization/clients?

*<show only the options marked in Q7 as relevant>*

- a) Expected retail rates 1 to 10 years from now
- b) Expected wholesale energy prices 1 to 10 years from now
- c) Expected capacity market prices
- d) Expected distributed energy resources tariffs
- e) Expected grid mix
- f) The waiting time in the interconnection queue or the interconnection cost
- g) Hosting capacity
- h) Distribution-level congestion
- i) Transmission-level congestion
- j) Emissions from the grid
- k) Consumer demand
- l) *<option typed in as "Other" in Q7>*
- m) All relevant information is available

10. Are there demand-response programs in which you organization/clients can participate?

- a) Yes
- b) No

11. What factors are important in your organization's/clients' decisions about participation in demand response programs? (Select all that apply)

*<show if answered "Yes" to Q10>*

- a) Expected electricity costs savings
- b) The minimum required duration of the response
- c) The expected frequency of response events
- d) The event notification time (10 minutes prior, 90 minutes prior, etc.)
- e) Penalties for failing to participate during a response event
- f) The complexity of the participation rules
- g) Limited discomfort/disturbance to main operations during the actual response
- h) Successful stories of demand response programs in other organizations of the same type
- i) Other: \_\_\_\_\_

12. When deciding whether to participate in a demand response program, did your organization/clients have access to all the information you needed to properly evaluate those factors?

*<show if answered "Yes" to Q10>*

- a) Yes
- b) No

13. What information about the demand response is **not accessible** for your organization/clients? (Select all that apply)

*<show if answered "Yes" to Q10 & answered "No" to Q12>*

- a) Expected electricity costs savings
- b) The minimum required duration of the response
- c) The expected frequency of response events
- d) The event notification time (10 minutes prior, 90 minutes prior, etc.)
- e) Penalties for failing to participate during a response event
- f) The complexity of the participation rules
- g) Disturbance to main operations during the actual response
- h) *<show "Other" from Q11 >*
- i) All relevant information is available

*<next question – Q40>*

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## **DER block**

*<block of questions shown to those who choose answer b) in Q2>*

14. Which of the following resources does your organization/clients manage? (Select all that apply)

- a) Renewable generation – solar or wind
- b) Aggregation of distributed generation resources
- c) Aggregation of demand response programs
- d) Batteries or other storage resources
- e) Other role around distributed energy resources

15. Does your organization/clients participate in wholesale markets?

- a) Yes
- b) No, but it might in the future
- c) No

16. Do you agree that your organization/clients have sufficient information to accurately forecast their own generation a day in advance?

*<show if answered a) or b) to Q14>*

- a) Strongly agree
- b) Somewhat agree
- c) Neither agree nor disagree
- d) Somewhat disagree
- e) Strongly disagree

17. Do you agree that your organization/clients have sufficient information to correctly forecast the amount of demand response available a day in advance?

*<show if answered c) to Q14>*

- a) Strongly agree
- b) Somewhat agree
- c) Neither agree nor disagree
- d) Somewhat disagree
- e) Strongly disagree

18. Please mark how important the following issues are for your organization's/clients' operations.

	Not important	Slightly important	Moderately important	Important	Very important
a) Current characteristics of local distribution network, such as hosting capacity, flow limits, or voltage limits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Future characteristics of the local distribution network, such as hosting capacity in 5 years	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Information on behavior of electricity consumers, e.g., consumption profiles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Future electricity sector policies, such as subsidy programs and emission pricing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. Which of the following properties of local distribution network are relevant for your organization/clients? (Select all that apply)

<show question if either future characteristics or current characteristics of distribution network marked higher than "Not significant" in Q18>

- a) Hosting capacity
- b) Impedences in distribution networks
- c) Voltage limits of the distribution nodes
- d) Apparent flow limits of the distribution lines
- e) Line losses
- f) The amount or characteristics of other DERs connected to that grid
- g) Other: \_\_\_\_\_

20. Of the following, what information is **easily accessible** to your organization/clients?

- a) Current characteristics of the local distribution network, such as hosting capacity, flow limits, or voltage limits
- b) Future characteristics of the local distribution network, such as hosting capacity in 5 years
- c) Information on behavior of electricity consumers, e.g., consumption profiles
- d) Future electricity sector policies, such as subsidy programs and emission pricing
- e) None of the above.

21. Of the following, what information is **not sufficiently available** to your organization/clients?

- a) Current characteristics of the local distribution network, such as hosting capacity, flow limits, or voltage limits
- b) Future characteristics of the local distribution network, such as hosting capacity in 5 years
- c) Information on behavior of electricity consumers, e.g., consumption profiles
- d) Future electricity sector policies, such as subsidy programs and emission pricing
- e) All the listed information is available to my organization/clients.

22. How does your organization/clients get information about electricity consumers' behavior?

*<show if marked 18c) higher than 1>*

- a) The information is public
- b) It is made readily available by local utilities, regulators or other parties
- c) It is made partly available by local utilities, regulators or other parties
- d) It is not available publicly but my organization/clients can get that data reliably
- e) It is not available publicly but my organization/clients can get that data somewhat reliably
- f) It is not available at all

23. What other type of information is your organization/clients missing when making decisions around distributed energy resources?

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24. How does the lack of information about local distribution networks affect your organization'/clients' investments in distributed energy resources? (Select all that apply)

- a) My organization/clients can invest only when they have all the information they need
- b) Investments take longer
- c) Investments become more risky
- d) It does not affect investments

25. Does the lack of information about local distribution networks affect how your organization/clients operates its storage resources?

*<show if answered d) in Q14>*

- a) Yes
- b) No

*<Next Question Q40>*

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## **Utilities block**

*<block of questions shown to those who choose answer c) in Q2>*

26. Please mark how important the following issues are for your organization's/clients' operations.

	Not important	Slightly important	Moderately important	Important	Very important
a) DER projects planned by residential customers in the utility's service area	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) DER projects planned by commercial and industrial customers in the utility's service area	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Load growth over the next 5 years	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) The need for distribution grid investments over the next 5 years	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Electricity consumption profiles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) The future electricity sector policies, such as subsidy programs and emission pricing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. Do you agree that your organization/clients are well informed about the planned DER projects undertaken by residential customers in the utilities' service area?

- a) Strongly agree
- b) Somewhat agree
- c) Neither agree nor disagree
- d) Somewhat disagree
- e) Strongly disagree

28. Do you agree that your organization/clients are well informed about the DER projects planned by commercial and industrial consumers independently of utility in its service area?

- a) Strongly agree
- b) Somewhat agree
- c) Neither agree nor disagree
- d) Somewhat disagree
- e) Strongly disagree

29. Do you agree that your organization/clients have sufficient information to correctly forecast the load growth over 5 years' time?

- a) Strongly agree
- b) Somewhat agree
- c) Neither agree nor disagree
- d) Somewhat disagree
- e) Strongly disagree

30. Do you agree that your organization/clients have sufficient information to correctly forecast what the needs for distribution grid investments are going to be in 5 years?

- a) Strongly agree
- b) Somewhat agree
- c) Neither agree nor disagree
- d) Somewhat disagree
- e) Strongly disagree

31. What type of information is your organization missing to forecast what the needs for investment in distribution grid are going to be in 5 years?

*<shown if answered "somewhat disagree" or "strongly disagree" in Q30>*

Response: \_\_\_\_\_

32. Do you agree that your organization/clients have sufficient information to correctly forecast what the rates for retail consumers are going to be in five years' time?

- a) Strongly agree
- b) Somewhat agree
- c) Neither agree nor disagree
- d) Somewhat disagree
- e) Strongly disagree

33. How well can your organization /clients forecast the response of consumers to various rate changes?

- a) Very well
- b) My organization/clients have a good general understanding of consumer behavior but providing numerical forecast would be challenging
- c) My organization/clients have a basic understanding of consumer behavior but they cannot forecast the response to rate changes
- d) Consumer behavior is very hard to understand for my organization/clients
- e) My organization/clients have not studied consumer behavior.

34. What other type of information is your organization/clients missing when making decisions around DERs and distribution networks?

\_\_\_\_\_

*<next question -> Q40>*

\_\_\_\_\_



## **NGO/regulators/others block**

*<block of questions shown to those who choose answer other than a), b) or c) in Q2>*

35. Please mark how important the following issues are for your organization's work.

	Not important	Slightly important	Moderately important	Important	Very important
a) Current characteristics of the local distribution networks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Future characteristics of the local distribution network, such as hosting capacity in 5 years	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Costs of running and maintaining the distribution network	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Behavior of electricity consumers, e.g., the consumption profiles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Wholesale market outcomes, such as the dispatch order or marginal generator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Investment costs or marginal generation costs of future resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Future electricity sector policies, such as subsidy programs and emission pricing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Distribution grid investment needs over the next 5 years	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) Future rates for retail consumers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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36. Of the kinds of information you listed as important, what information is **easily accessible** for your organization/clients? (Select all that apply)

*<show only the options marked in Q35 as at least slightly important>*

- a) Current characteristics of the local distribution networks
- b) Future characteristics of the local distribution network, such as hosting capacity in 5 years
- c) Costs of running and maintaining the distribution network
- d) Behavior of electricity consumers, e.g., the consumption profiles
- e) Wholesale market outcomes, such as the dispatch order or the marginal generator
- f) Investment costs or marginal generation costs of future resources
- g) Future electricity sector policies, such as subsidy programs and emission pricing
- h) Distribution grid investment needs over the next 5 years
- i) Future rates for retail consumers
- j) None of the above

37. Of the kinds of information you listed as important, what information is **not accessible** for your organization/clients? (Select all that apply)

*<show only the options marked in Q35 as at least slightly important>*

- a) Current characteristics of the local distribution networks
- b) Future characteristics of the local distribution network, such as hosting capacity in 5 years
- c) Costs of running and maintaining the distribution network
- d) Behavior of electricity consumers, e.g., the consumption profiles
- e) Wholesale market outcomes, such as the dispatch order or the marginal generator
- f) Investment costs or marginal generation costs of future resources
- g) Future electricity sector policies, such as subsidy programs and emission pricing
- h) Distribution grid investment needs over the next 5 years
- i) Future rates for retail consumers
- j) There is no such information

38. Which of the following properties of local distribution network is relevant for your organization/clients? (Select all that apply)

*<show only if distribution grid investments, current or future characteristics marked in Q35 as at least slightly important>*

- a) Hosting capacity
- b) Impedances
- c) Voltage limits of the distribution nodes
- d) Apparent flow limits of the distribution lines
- e) Other: \_\_\_\_\_

39. What other type of information is your organization/clients missing when making decisions around distributed energy resources?

\_\_\_\_\_

## **Block of questions for all**

*<show to all>*

40. Do you agree that, from the perspective of your organization/clients, the future electricity sector policies, such as subsidy programs and emission pricing, are uncertain?

- a) Strongly agree
- b) Somewhat agree
- c) Neither agree nor disagree
- d) Somewhat disagree
- e) Strongly disagree

41. Do you agree that your organization/clients have sufficient information to correctly forecast marginal emissions for the electricity sector in any period?

- a) Strongly agree
- b) Somewhat agree
- c) Neither agree nor disagree
- d) Somewhat disagree
- e) Strongly disagree

42. How strong is the impact of missing or incomplete information identified in the questions above on the functioning of your organization/clients?

(0- there is no effect, 10- information problems are making a successful operation of my organization/my clients' organizations almost impossible)

*not asked in NY*



(respondent moves the gauge on a scale between 0 and 10)

43. How does the missing or incomplete information affect your organization/clients? (Select all that apply)

*not asked in NY*

- a) it changes the achievable profits
- b) it changes the effectiveness of actions
- c) it affects competitiveness
- d) it affects the pace of decision-making or actions
- e) it affects what projects are feasible
- f) it affects the risk profile of the projects
- g) it doesn't affect my organization/clients
- h) other \_\_\_\_\_

44. How does your organization/clients compensate for lack of information? (Select all that apply)
- a) It ignores the missing piece of information
  - b) It replaces the lacking information with own assumptions
  - c) It follows the assumptions or approaches used by other organizations to deal with lacking information
  - d) It uses historical data to forecast the future values
  - e) Other: \_\_\_\_\_
45. Where does your organization/clients usually get the information about electricity sector? (Select all that apply)
- a) Regulatory submissions
  - b) websites of RTOs/ISOs (e.g. MISO, SPP, CAISO)
  - c) FERC data
  - d) Private data companies and consultancies
  - e) In-house analytics
  - f) The local utility
  - g) Direct inquiries with other sector's participants
  - h) Other \_\_\_\_\_
46. Do you think there is a need for new regulation that would ensure the availability of information that is relevant for your organization/clients for making decisions related to distributed energy resources?  
not asked in NY
- a) Yes
  - b) No
  - c) I have no opinion
47. Has the coronavirus pandemic changed your responses to any of the above questions?
- a) Yes, to many of them
  - b) Yes, to some of them
  - c) No