

IPA Integrated Resource Planning Workshop #2: Candidate Resources

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Question 1

Are there specific resource types that are not adequately captured by the proposed categories and should be reflected in the IRP framework?

The workforce pipeline that delivers trained workers to install and maintain candidate resources is not captured anywhere in the IRP framework. This is not a new resource type but a supply constraint that affects the deployment of multiple resource categories, particularly solar PV, energy efficiency, and HVAC systems.

DCEO's Illinois Clean Jobs Workforce Network Program Annual Report (April 1, 2026) documents the statewide pipeline of trained workers across these exact trades. Since the program launched in 2024, the network has produced 745 graduates statewide, placed 153 in clean energy jobs, and partnered with 96 employers across 16 regions. This public data has not been referenced in any IRP workshop material. We recommend it be incorporated as a deployment constraint input alongside the interconnection, permitting, and financing constraints already reflected in the candidate resource framework.

Source: DCEO Annual Report, April 1, 2026. dceo.illinois.gov/ceja.html

Question 2

Are there any resource categories that should be added, removed, or redefined to better reflect meaningful differences in cost, performance, or system value?

We recommend that installation labor availability be incorporated as a variable affecting the maximum annual deployment limits and commercial availability dates for resources that require significant field installation, particularly solar PV, energy efficiency programs, and HVAC systems.

This does not require a new resource category. It requires a new input parameter within existing resource categories that reflects whether the trained installation workforce exists at the rate and scale the model's deployment assumptions require.

CRGA's equity requirements under Sections 16-201 and 16-202 also require the IRP to evaluate whether Equity Eligible Contractors, which are businesses that hire graduates of the hub network, are participating in clean energy contracts. CRGA directs \$7 million per year specifically to support EEC participation. Neither the supply-side nor demand-side candidate resource presentations in Workshop 2 addressed this requirement. No input or metric currently operationalizes it in the candidate resource framework.

Source: DCEO Annual Report, April 1, 2026. CRGA, Public Act 104-0458, Sections 16-201 and 16-202.

Question 3

What feedback do you have on the proposed base case cost assumptions for mature technologies (including solar, wind, lithium-ion storage, and gas)?

Please indicate which specific assumption you are commenting on, describe the reason for your feedback, and provide any alternative data source or supporting materials that you would like us to consider to support your recommendation. Please provide a link or share via email.

We do not have alternative data on capital costs, O&M, or financing assumptions for solar, wind, storage, or gas, and defer to stakeholders with direct market data on those inputs.

We note one gap in the cost framework: installation labor is not modeled as a variable affecting deployment timelines or costs. The Illinois Resource Cost Workbook documents capital costs, fixed O&M, and financing assumptions but does not include labor availability as a factor affecting when and how fast resources can be physically deployed. For energy efficiency and HVAC resources specifically, labor availability is a constraint on delivery rates that should be evaluated. If that factor is not reflected, the cost assumptions embedded in the model may understate total delivery cost and overstate achievable deployment pace.

Source: Illinois Resource Cost Workbook, E3, April 2026.

Question 4

What feedback do you have on the proposed base case cost assumptions for emerging technologies (including nuclear and long duration storage)?

Please indicate which specific assumption you are commenting on, describe the reason for your feedback, and provide any alternative data source or supporting materials that you would like us to consider to support your recommendation. Please provide a link or share via email.

No comment from our organization. This topic is outside our area of expertise.

Question 5

What feedback do you have on the proposed commercial availability timelines shown on Slide 18? Please identify any technology timelines you believe should be revised, why you think it should be revised, and any supporting data or materials you have to support your recommendation.

We recommend the Agencies test a sensitivity applying a 12 to 18 month delay to the commercial availability dates for solar PV, energy efficiency, and HVAC resources in the ComEd zone and MISO LRZ 4.

The basis for this range is interconnection queue delay data from Lawrence Berkeley National Laboratory, which the 2025 Resource Adequacy Study cites directly (Executive Summary, Section 1.2, p. iv, footnote 2). LBNL documents that interconnection wait times grew from under 2 years for projects built in 2000-2007 to a median of 5 years for projects built in 2023, and that only 19 percent of projects entering queues from 2000 to 2018 were ever built. LBNL identifies interconnection backlogs, transmission upgrade costs, and regulatory processes as the primary documented constraints. We submit that workforce availability is an additional component of development capacity not yet reflected in the commercial availability timeline assumptions.

The 2031 IRA tax credit expiration modeled in E3's current assumptions makes this sensitivity more consequential. Delays that push projects past the 2030 commercial operations deadline materially increase costs under E3's own cost framework. A delay sensitivity should be tested before the cost cliff is locked into the model as a fixed planning assumption.

Source: LBNL, Queued Up: 2024 Edition, April 2024, cited in 2025 RA Study, Executive Summary, Section 1.2, p. iv, footnote 2. emp.lbl.gov/publications/queued-2024-edition-characteristics

Question 6

Please refer to the approach to modeling VPPs in this IRP on slide 29. Are there any targeted refinements you would recommend to improve the robustness of this approach and the results?

We recommend one refinement: incorporate workforce and installation labor availability as a constraint on the VPP deployment trajectory used to define available capacity over time.

VPP programs enroll customers who already have eligible equipment installed, including smart thermostats, HVAC demand response systems, heat pumps, and behind-the-meter storage. That equipment must be physically installed by trained workers before enrollment is possible. The Illinois Clean Jobs Workforce Network trains HVAC technicians and energy efficiency workers who perform this installation work. The statewide pipeline data documenting these workers is published in DCEO's Annual Report and has not been incorporated into any demand-side assumption in the IRP framework.

Additionally, energy efficiency is embedded as a baseline assumption across all ten IRP scenarios. If the workforce pipeline cannot deliver graduates at the rate those programs require, the baseline is overstated in every scenario simultaneously. We recommend E3 test energy efficiency program achievement at 100%, 75%, and 50% of baseline targets to make this risk visible before it is locked into the modeling.

CRGA requires ComEd and Ameren to file VPP tariff proposals by June 1, 2026. The participation rates those programs assume will depend on how fast eligible equipment can be installed

regionally. We recommend E3 consult DCEO's regional workforce data when setting VPP deployment trajectories by year and region.

Source: DCEO Annual Report, April 1, 2026. dceo.illinois.gov/ceja.html CRGA, Public Act 104-0458.

Question 7

As shown on Slide 29, this IRP will model one representative VPP made up of multiple DER building blocks. Please rank which VPP building blocks you believe are most important to include in a representative VPP. (BTM solar, BTM storage, Managed EV charging, Residential smart thermostats, Water heater controls, Commercial building controls, Others).

Residential smart thermostats; BTM solar; BTM storage; Managed EV charging; Water heater controls; Commercial building controls; Others;

Question 8

Slide 30 identifies key VPP parameters that will inform the representative VPP to be modeled in the IRP. Please use the parameter categories shown when responding to the following questions. Please provide specific assumptions where possible with supporting data sources and/or program examples, where available.

- *Based on the building block rankings you provided in your response to the previous question, please specify the percentage of total VPP nameplate capacity you recommend assigning to each building block.*
- *Of those building blocks, how would you distinguish between existing and new resources in your proposal?*
- *What available capacity should be assumed for this VPP? How should it be assumed to vary over the year?*
- *How long may this VPP sustain the response? How frequently?*
- *What may this VPP cost?*

Composition:

We recommend HVAC demand response controls and smart thermostats represent at least 40 to 50 percent of the representative VPP's nameplate capacity, given CRGA's expanded utility energy efficiency program requirements and the regional installation workforce available to deploy this equipment. We do not have specific percentage recommendations for other building blocks and defer to utility and aggregator stakeholders with program data.

Existing versus new resources:

The majority of HVAC and energy efficiency equipment in Illinois residential and commercial buildings is aging and will be eligible for replacement under CRGA's expanded efficiency programs

starting June 1, 2026. New installations under those programs represent new enrollable resources, not existing ones. The pace at which new equipment can be installed and enrolled is the primary constraint on VPP capacity growth in the HVAC and energy efficiency category.

Available capacity:

We do not have enrollment projection data and defer to utilities and program operators on this parameter. We note that regional installation labor availability, documented in DCEO's Annual Report by hub region and training track, should inform capacity projections. That data is available at dceo.illinois.gov/ceja.html.

Duration and frequency:

We do not have program data for this parameter.

Cost:

We do not have program cost data for this parameter. We note that the cost of training the installation workforce that deploys VPP-eligible equipment is documented in DCEO's Annual Report. The \$49.4 million total program investment since launch reflects the public investment in producing the workforce that makes VPP deployment possible at scale. (Source: DCEO Annual Report, April 1, 2026, pp. 2-3.)

Question 9

Do you have any feedback to provide on the Assumptions workbook separately posted? Please note the specific assumption, your recommendation, and any data or supporting materials to support your recommendation.

One observation on the workbook structure: installation labor is not represented as a cost or constraint variable for any resource category. The workbook documents capital costs, fixed O&M, financing assumptions, and tax credit treatment for each technology. The workforce required to install and maintain those resources, particularly solar, energy efficiency, and HVAC systems, is not reflected anywhere in the assumptions.

For solar PV specifically, the Data Sources tab notes that capital costs are benchmarked against public market data with NREL ATB adjustments. We recommend E3 assess whether those cost benchmarks reflect current Illinois-specific labor market conditions, including any regional variation in certified installer availability across the ComEd and Ameren service territories.

Source: Illinois Resource Cost Workbook, E3, April 2026. Data Sources tab.

Question 10

If CCS is considered as an added, co-paired technology with natural gas resources in a scenario:

- *What is a likely timeframe for when this technology could be reasonably expected to be commercially operational and accessed?*

- *What is reasonable costing for this technology to be included in modeling and analysis? Include data and reports to support your answer.*

No comment from our organization. This topic is outside our area of expertise.

Question 11

While current policy expects that CCS would fully sequester all carbon emissions to comply with CEJA (i.e. 100% carbon sequestration), a lower percentage of carbon sequestration may be more likely (e.g. 80% or 90% of sequestered carbon, i.e. 10-20% carbon emissions). Please provide a recommendation for a different percentage if 100% carbon sequestration is deemed to not be operationally likely during the term being modeled (2027-2047). If a different percentage is proposed, please support your recommendation.

No comment from our organization. This topic is outside our area of expertise.