

CIGRE Study committee C5

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

JWG C5/C1.43

NAME OF THE CONVENOR

Williams Pippa (AUSTRALIA)

TITLE

Approaches to account for the contribution of short-duration electric storage systems in capacity adequacy assessment

THE WG APPLIES TO DISTRIBUTION NETWORKS: NO

ENERGY TRANSITION

1 / Storage

5 / Grids and Flexibility

POTENTIAL BENEFIT OF WG WORK

1 / commercial, business, social, economic benefits

2 / potential interest from a wide range of stakeholders

3 / likely to contribute to new or revised industry standards

4 / state-of-the-art or innovative solutions or directions

STRATEGIC DIRECTION

1 / The electrical power system of the future reinforcing the End-to-End nature of CIGRE: respond to speed of changes in the industry by preparing and disseminating state-of-the-art technological advances

2 / Making the best use of the existing systems

SUSTAINABLE DEVELOPMENT GOAL

7 / Affordable and clean energy

9 / Industry, innovation and infrastructure

BACKGROUND :

As power systems transition to accommodate greater penetrations of variable renewable energy, short-duration energy storage, particularly battery electric storage systems (BESS), are being increasingly utilised to maintain supply-demand balance.

Capacity adequacy may be evaluated through application of simulation models that assume varying degrees of "perfect foresight". i.e., that variability in demand and/or intermittent renewable power resource is known in advance to inform intertemporal decision-making. This may more likely be the case in power systems that have been dominated by thermal generation capacity. Alternately, hydro-dominated systems typically use stochastic and/or heuristic models which consider uncertainty over days, seasons, and/or years. For short-duration storage such as BESS, an assumption of perfect foresight may overstate availability to contribute to capacity adequacy, while traditional hydropower methodologies are less suited to cases where the storage duration is similar to the optimisation time-step. Given BESS is projected to significantly contribute to dispatchable supply in future power systems, it is important to accurately assess the probability that generation capacity (backed by adequate electric storage state of charge) will be available when it is most needed.

PURPOSE / OBJECTIVE / BENEFIT OF THIS WORK :

The purpose of this working group is to understand and collate information about how different power systems and markets are considering short-term electric energy storage in resource capacity adequacy assessments. The work will consider implications from short-term (operational planning, hours or days ahead) to longer term (years-ahead, capacity expansion/investment planning).

SCOPE :

This work will consist of:

- 1. A survey of local and international market and utility planning practices and approaches
 - 2. A literature survey of state of current thinking in this area
 - 3. An interim report at the end of completion of a and b. (e.g. webinar or Electra article can be prepared at this point)
- The information gathered will be assessed, and approaches will be compared in terms of trade-offs between:

- 1. implementation complexity,
- 2. computational complexity, and
- 3. theoretical accuracy.

A comparative analysis will consider whether requirements and approaches differ according to factors such as market type (day-ahead vs real time) and technology/fuel mix in the existing system.

The work will also assess, and if practicable develop, additional approaches for appropriately capturing the impact of state of charge uncertainty for short-duration storage in resource adequacy assessments.

Inclusions and exclusions:

This WG will focus on utility-scale storage of short duration (up to 8 hours). It will focus on capacity for electrical energy delivery only, given other working group scopes include a broader range of services (e.g. C1.51). The WG will consider behavioural drivers of short-duration storage asset operators in power systems with and without centralised intertemporal dispatch optimisation. The WG will consider issues and approaches pertaining primarily to years-ahead (investment timeframe) capacity adequacy assessment. A comparison of investment timeframe capacity adequacy assessment relative to hours and/or days-ahead operational planning will be included in the scope of the survey, to identify potential mismatch between investment timeframe and operational timeframe capacity adequacy assessment methods. The WG will also consider market and regulatory approaches to improve visibility and coordination.

The scope excludes the behaviours of distributed energy resources, bid aggregators and virtual power plants. It will not consider services other than energy & capacity in detail, and it will not consider potential perverse interactions between automated bidding algorithms.

DELIVERABLES AND EVENTS

Deliverables Types

Annual progress and activity report to Study Committee
Electra report
Technical Brochure and Executive Summary in Electra
Webinar

Deliverables schedule

Electra report	Q1	2026	Interim report
Technical Brochure	Q4	2026	Technical Brochure
Webinar	Q4	2026	Tutorial/Webinar

Time schedule

Q2	2025	Recruit members (National Committees, WiE, NGN)
Q3	2025	Develop final work plan
Q3	2025	Finalize survey form
Q1	2026	Collect survey responses
Q2	2026	Interim report
Q3	2026	Draft Technical Brochure
Q4	2026	Finalize Technical Brochure
Q4	2026	Webinar

APPROVAL BY TECHNICAL COUNCIL CHAIRMAN:

Rannveig S. J. Loken
May 11th, 2025