

CIGRE Study Committee C5

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG 1^o C5.31	Name of Convenor: Angela Chuang (USA) E-mail address: achuang@epri.com	
Technical Issues #²: 5, 10		Strategic Directions #³: 1, 2
The WG applies to distribution networks⁴: Yes		
Potential Benefit of WG work #⁵: 1, 2, 3, 4, 5, 7		
Title of the Group: Wholesale and Retail Electricity Cost Impact of Flexible Demand Response		
Scope, deliverables and proposed time schedule of the WG: Background: <p>Reliable and environmentally responsible electricity delivery has received much attention among system operators, including those participating in working groups of CIGRE Study Committee C5. Affordability of electric service is another dimension of electric service provision that also merits adequate attention. The proposed study is to focus on opportunities in wholesale and retail markets to advance affordability of electric service for end-use customers who ultimately pay for the costs resulting from system expansion, operations, and maintenance. The study aims to provide an international view of the connection between retail programs/rate structures to costs incurred in the provision of electric service that may be impacted by flexible demand response (DR). Demand response (DR) includes all forms of demand-side response, which refers to a change in load coordinated with system or market needs. The change in load behind the utility meter of the customer can stem from end-use equipment, storage, PV, and other forms of distributed generation. The study also aims to analyse the methods applied in practice to either directly or indirectly reduce costs, by service territory, in both regulated and competitive market environments. Introductory background on the functions that flexible DR supports and how it is factored into system planning and/or operations will be addressed at a high-level to provide context for presentation of findings by service territory. The study will also identify and clarify terminology, in order to assist data collection and presentation of findings with consistency to support ready comparison of findings across service territories.</p>		
Scope: <ol style="list-style-type: none"> 1. Opportunities for Flexible DR in Wholesale and Retail Markets to Impact Costs resulting from decisions made in system planning and operations <ol style="list-style-type: none"> a) Overview of major functions performed in system operations and planning b) Association with cost components in the entire value chain from electricity production to delivery <ul style="list-style-type: none"> • Assumptions for survey including flexibility services • Opportunities for provision of flexibility requirements by service territory • Opportunity trends • Common concerns/comments of survey respondents c) Overview of methods currently implemented to reduce costs with Flexible DR <ul style="list-style-type: none"> • Guiding principles • How costs are impacted and who decides on how DR impacts resource procurements • Adjustments (how deviations between expected and actual costs are handled) 		

- Drawbacks of current methods of supply-side DR opportunities
 - Innovative methods and potential improvements, especially considering the potential of widespread prosumerism
2. Retail Program and Rate Structures as Enablers for Cost Impact
 - a) Description of retail rate structures (based on publication of WG C5.16)
 - Default rate structures
 - Innovative rate structures and targeted improvements
 - b) Connection to enabling cost reduction in system planning or operations
 - Case study examples
 - Enabling technology prerequisites (especially to support innovative/scalable methods)
 3. Capability of Technology Types to Support Capture of Cost Savings
 - a) Technology types taxonomy
 - Device level
 - Aggregate level
 - b) Potential for enabling cost reduction in system planning or operations
 - Sample data collection demonstrating aggregate device response and flexibility
 - Remarks on potential to provide DR flexibility for cost reduction

Lessons learned are to focus on commonalities and trends for cost impact leveraging of flexible DR. Findings will be summarized and delivered in a technical paper and brochure.

Note: The WG is to include a specific liaison with Study Committee C6 for information on topics related to Distributed Energy Resource (DER) technology as well as Distribution Planning and Operations. The WG is to coordinate with the following working groups: WG C6.35, JWG C6/C2.34, WG C6.39, and JWG C1/C6.42. Observers are welcomed (e.g., D2).

Time Schedule:

- Phase 0: WG formed (Initial meeting, Sept 2019)
- Phase 1: Survey instrument drafted and contacts identified (Dec 2019)
- Phase 2: Survey response collected and analyzed (Dec 2020)
- Phase 3: Conference Paper drafted (Summer 2021)
- Phase 4: Draft of technical report (Spring 2022)
- Phase 5: Finalize technical report, Electra article, and tutorial presentation (August 2022)

Deliverables:

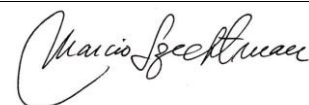
- Technical Brochure and Executive Summary in Electra
- Electra Report
- Tutorial⁶
- Webinar⁶

Time Schedule: start in September 2019

Final Report: August 2022

Approval by Technical Council Chairman:

Date: April 2nd, 2019



Notes: ¹ Working Group(WG), Joint WG(JWG), ² See Table 1, ³See Table 2, ⁴ Delete as appropriate, ⁵ See Table 3, ⁶ Presentation of the work done by the WG.

Table 1: Technical Issues for creation of a new WG

1	Active Distribution Networks resulting in bidirectional power and data flows within distribution levels up to higher voltage networks
2	Digitalization of the Electric Power Units (EPU): Real-time data acquisition includes advanced metering, processing large data sets (Big Data), emerging technologies such as Internet of Things (IoT), 3D, virtual and augmented reality, secure and efficient telecommunication network
3	The growth of direct current (DC) and power electronics (PE) at all voltage levels and its impact on power quality, system control, system operation, system security, and standardisation
4	The need for the development and significant installation of energy storage systems, and electric transportation, considering the impact they can have on the power system development, operation and performance
5	New concepts for system operation, control and planning to take account of active customer interactions, and different generation types, and new technology solutions for active and reactive power flow control
6	New concepts for protection to respond to the developing grid and different generation characteristics
7	New concepts in all aspects of power systems to take into account increasing environmental constraints and to address relevant sustainable development goals.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics
9	Increase of right of way capacity through the use of overhead, underground and submarine infrastructure, and its consequence on the technical performance and reliability of the network
10	An increasing need for keeping Stakeholders and Regulators aware of the technical and commercial consequences and keeping them engaged during the development of their future network

Table 2: Strategic directions of the Technical Council

1	The electrical power system of the future: respond to speed of changes in the industry
2	Making the best use of the existing systems
3	Focus on the environment and sustainability
4	Preparation of material readable for non-technical audience

Table 3: Potential benefit of work

1	Commercial, business, social and economic benefits for industry or the community can be identified as a direct result of this work
2	Existing or future high interest in the work from a wide range of stakeholders
3	Work is likely to contribute to new or revised industry standards or with other long term interest for the Electric Power Industry
4	State-of-the-art or innovative solutions or new technical directions
5	Guide or survey related to existing techniques; or an update on past work or previous Technical Brochures
6	Work likely to contribute to improved safety.
7	Work addressing environmental requirements and sustainable development goals.