

CIGRE Study Committee C5
PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP¹

WG N° C5.30	Name of Convenor: David Bowker (Australia) E-mail address: dgbowker@gmail.com	
Strategic Directions #²: 1		Technical Issues #³: 5
The WG applies to distribution networks⁴: Yes		
Potential Benefit of WG work #⁶: 2, 4		
Title of the Group: The Role of Block Chain Technologies in Power Markets		
Scope, deliverables and proposed time schedule of the Group: Background: Block chain technologies offer an exciting opportunity in decentralized trading systems. Their rise has coincided with power systems becoming more decentralized and a world in which consumers can collectively control quite large energy sources. They offer the opportunity for consumers to trade their power sources and their load effectively with the potential to reduce their energy costs. Scope: This working group will consist of two streams of work. The first phase, Exploration , is an assessment of the potential value and uses of block chain technologies in energy markets and power systems. This will include an explanation of how they work and some simplified examples of possible applications. Specifically this stage will: <ul style="list-style-type: none"> • gather information on the characteristics of distributed ledger products. • consider the range of potential applications in electricity both for financial and physical parameters • consider the implications for the electricity industry: efficiency and scope for new approaches with vastly more transactions - vs - disruption and the risk of being bypassed The second phase, Assessment , will be a review of a range of trials and examples of early adoption of projects that use block chain, to document their value and practicality. During the project, a set of assessment criteria will be developed and applied to the trials and examples. SC D2 will be represented in this WG. Given the fast-moving nature of this topic, there will be a short review/update as the last step in the development of the Technical Brochure to ensure that the document is as up to date as possible. The possibility of shortening the approval and publication timelines will also be investigated along with the possibility of early electronic publishing. Deliverables: <input checked="" type="checkbox"/> Technical Brochure and Executive summary in Electra <input type="checkbox"/> Electra report <input checked="" type="checkbox"/> Colloquium/Symposium Paper <input checked="" type="checkbox"/> Webinar/Tutorial ⁵		

Time Schedule: start: April 2019

Final Report: December 2020

Work breakdown:

- | | |
|---|----------------|
| • Develop final work plan and recruit members | May 2019 |
| • First meeting (in Montreal) to discuss the work plan | September 2019 |
| • Select projects for Assessment Phase (in Montreal) | September 2019 |
| • Complete initial assessment of projects | March 2020 |
| • Finalise Exploration Phase (Paris) | August 2020 |
| • Review Project Assessments and develop insights (Paris) | August 2020 |
| • Update project assessments for final report | September 2020 |
| • Draft Report with conclusions | November 2020 |
| • Final report approved | December 2020 |

Approval by Technical Committee Chairman:

Date: December 12th, 2018



Notes: ¹ WG or Joint Working Group (JWG) or Collaborative WG (CWG), ² See attached Table 2, ³ See attached Table 1,

⁴ Delete as appropriate, ⁵ Presentation of the work done by the WG, ⁶ See attached table 3

Table 1: Technical Issues of the TC project "Network of the Future" (cf. Electra 256 June 2011)

1	Active Distribution Networks resulting in bidirectional flows
2	The application of advanced metering and resulting massive need for exchange of information.
3	The growth in the application of HVDC and power electronics at all voltage levels and its impact on power quality, system control, and system security, and standardisation.
4	The need for the development and massive installation of energy storage systems, and the impact this can have on the power system development and operation.
5	New concepts for system operation and control to take account of active customer interactions and different generation types.
6	New concepts for protection to respond to the developing grid and different characteristics of generation.
7	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
9	Increase of right of way capacity and use of overhead, underground and subsea infrastructure, and its consequence on the technical performance and reliability of the network.
10	An increasing need for keeping Stakeholders aware of the technical and commercial consequences and keeping them engaged during the development of the network of the future.

Table 2: Strategic directions of the TC (ref. Electra 249 April 2010)

1	The electrical power system of the future
2	Making the best use of the existing system
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 or economic benefit 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 direction
5	Guide or survey related to existing techniques. Or an update on past work or previous Technical Brochures
6	Work likely to have a safety or environmental benefit