



Energy Systems for Sustainable Communities



cigre

New Zealand

2022 Conference

November 8-10

Whakatane & Online

Energy Systems for
Sustainable Communities

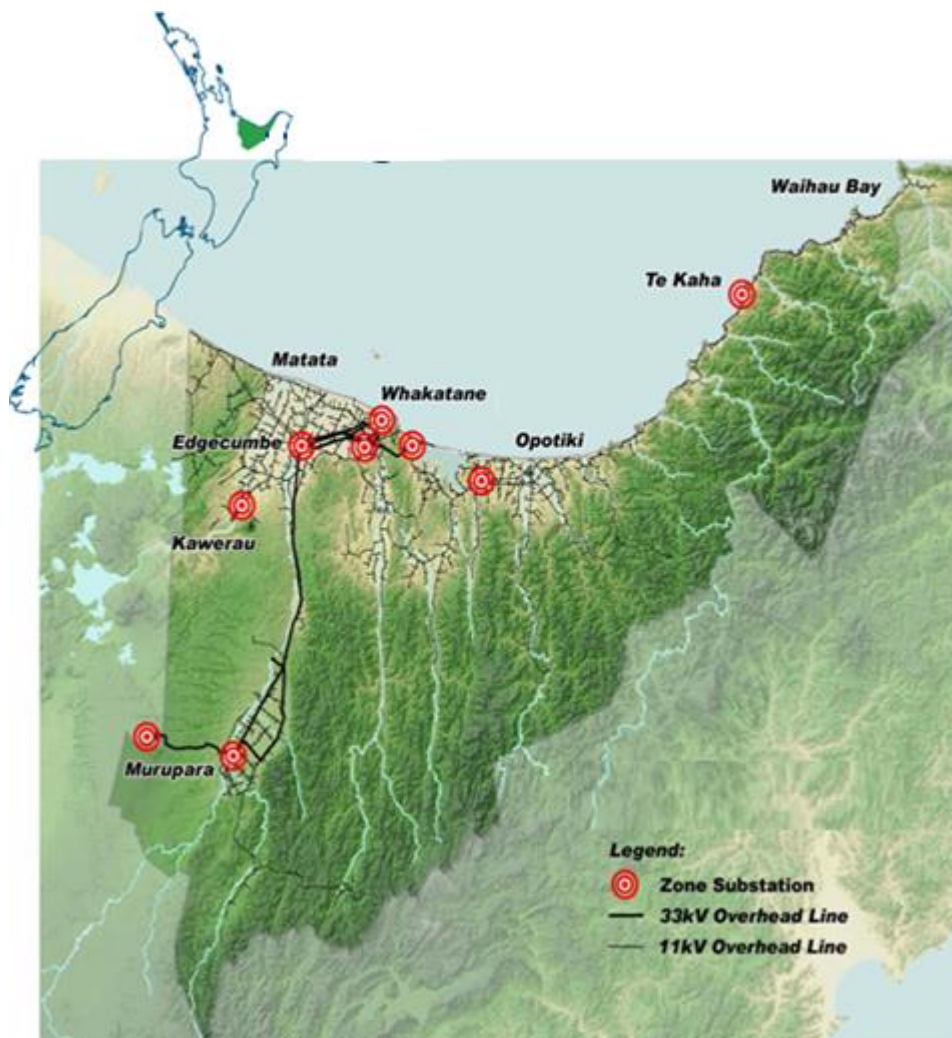


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For power system expertise



Venue: Te Whare Wānanga o Awanuiārangi
13 Domain Road, Whakatane & Online



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TE WHARE WĀNANGA O
AWANUIĀRANGI



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Waipapa Taumata Rau
NEW ZEALAND

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DEPARTMENT OF ELECTRICAL,
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For additional information, please contact:
CIGRE New Zealand Conference Committee
021 199 034V | cigrenz2022@gmail.com

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ACKNOWLEDGMENTS

The conference chair on behalf of the CIGRE New Zealand National Committee (NZNC) expresses his deep appreciation to the hosts and sponsors who are supporting CIGRE NZ 2022 Conference.

CIGRE NZ also extends its gratitude to organizations, individuals, and volunteers who have contributed to this conference and especially to the Te Whare Wānanga o Awanuiārangi, Waipapa Taumata Rau / University of Auckland (Electrical, Computer and Software Engineering Department), Counties Energy and Horizon Networks for its on-ground, digital and organizational expertise in helping host the conference in a hybrid manner and for their venue koha in making the conference financially accessible to all industry and individuals to join, share, learn and explore over the three intensive days of conference.

Special thanks to Waqar Qureshi, for extending hands-on local terrain support in event organization, advocating, and bringing the conference to the Bay of Plenty region.

Thank you

Abhinav Chopra

CIGRE NZ 2022 Conference Chair

021 199 0 34 V

www.cigre.org.nz



ABOUT CIGRE

CIGRE is a permanent, non-governmental and non-profit international association.

Based in France, CIGRE was founded in 1921. CIGRE is an international organization dedicated to the development of the power supply sector through the identification and the development of solutions to industry issues. With members in more than 80 countries, it is the leading worldwide organization on Electric Power Systems, covering their technical, economic, environmental, operational, organizational, and regulatory aspects.

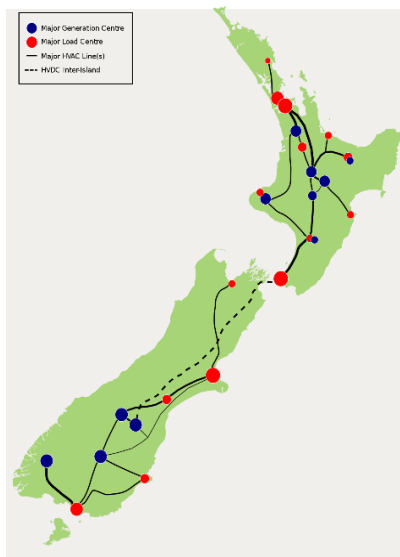
CIGRE counts more than 3,500 experts from all around the world working actively together in structured work programmes coordinated by the CIGRE 16 Study Committees, overseen by the Technical Council. Their main objectives are to design and deploy the end-to-end power system for the future, optimize existing equipment and power systems, respect the environment, and facilitate access to information.



CIGRE NEW ZEALAND NATIONAL COMMITTEE

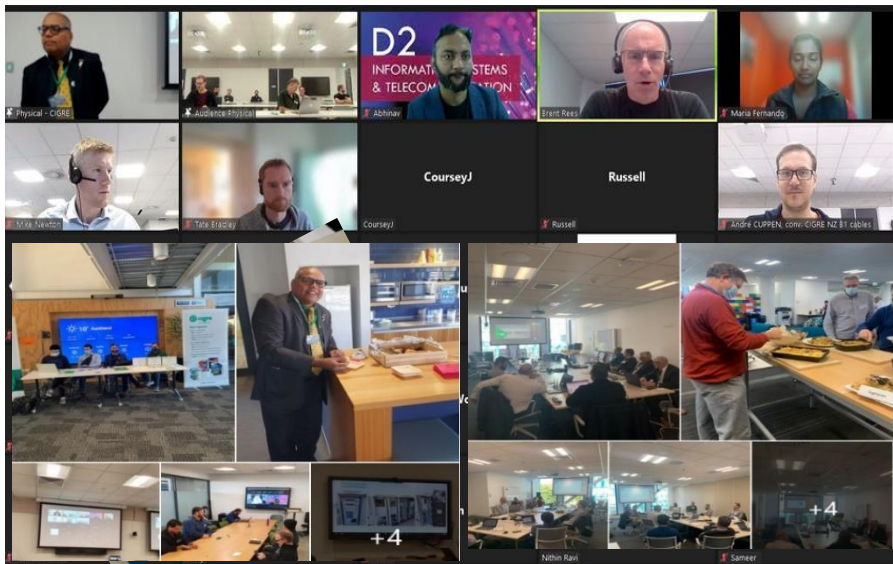
The New Zealand National Committee (NZNC) was accepted as a full CIGRE National Committee by the CIGRE Administrative Council at its meeting held during the 2006 Paris Session. Since then we have been active nationally and internationally through engagements of:

- Disseminate CIGRE information and maintain communication with local NZ members regularly
- Provide a platform for presenting NZ expertise and experience to the New Zealand and International power systems community
- Active point of contact for CIGRE Paris, the ANC and other National Committees
- Take our place on the world stage at CIGRE Paris with the other CIGRE National Committees
- Invitations and hosts to CIGRE Study Committees to hold meetings in NZ
- Participate as a member of the Asia Oceania Regional Council (AORC) of CIGRE
- Participating in, and providing internationally recognised keynote speakers for EEA2018, EEA2019, EEA2020, EEA 2021, EEA 2022 annual conferences
- Arranged and hosted Regional/Global Conferences and Symposia such as CIGRE Auckland Symposium 2013, B5 Colloquium 2017, AORC 2017, Administrative Council Meeting 2017, and CIGRE ANZ 2018 in conjunction with AUPEC 2018 and more.



CIGRE NZ NATIONAL COMMITTEE COMPOSITION

Member	Position	Collective Organisation
Doug Ray	Chair / AORC Member	Vector
Waqar Qureshi	Executive Member	Horizon Networks
Nick Lee	Secretary	Transpower
Dr Nirmal Nair	Technical Chair	University of Auckland
André Cuppen	Executive Member	PowerCo
Andrew Renton	Executive Member	Transpower
Brent Rees	Executive Member	Hitachi Energy
Trevor Lord	Executive Member	Individual
Rebecca Marx	Membership Manager	Mitton ElectroNet
Vaughan Evans	Publicity Chair	Individual
Leonie Bule	Women in Energy Chair	University of Auckland
Abhinav Chopra	CIGRE Conference Chair 2022	Counties Energy



INTRODUCTION FROM CONFERENCE CHAIR



Kia ora koutou katoa

On behalf of our CIGRE NZ Conference Committee and our CIGRE NZ Executive and members, it is a privilege and pleasure to welcome you to our annual CIGRE NZ 2022 Conference whose focus is on “Energy Systems for Sustainable Communities”, first in class cleaner and greener conference with reduce, reuse, recycle mitigations put into practice. Welcome to one of the most sustainable and least carbon on-premise and on-line conference ever hosted in the regions.

Having contributed extensively to the CIGRE webinars, conferences, CIGRE D2, ISO: IWA 39 – Cyber Physical Systems, Blockchain usage, IoT, AI and ML, Data Mesh, DERMS, ARM, ADMS, substation automation architecture, future grid architecture; it was an honour to be part of the conference committee team as the chair.

The team worked hard to establish a cohesive program to give you an informative, collegiate experience and enriched new learnings from our dynamically changing energy environment with latest government policies, innovation, reach, electrification and the survival of the human kind itself. We are bringing together novel energy systems and industry expertise from across New Zealand and internationally.

We are indebted to our masterclass presenter, keynote speakers, forum panellists, workshop leads, technical paper presenters, regional hosts, you and sponsors: thank you for making a difference to our knowledge sharing.




As we build our new energy future, we believe the importance of building successful knowledge sharing platforms will drive the energy systems for sustainable communities of the future. Hope you will enjoy the conference.

Nga mihi, and thank you for being with us.

Abhinav Chopra

CONFERENCE COMMITTEE

The world needs dreamers and the world needs doers. But above all, the world needs dreamers who do. Thanks to our organisational team below:

Member	Position	Pictures
Abhinav Chopra, Counties Energy	Conference Chair D2 Convenor	
Nirmal Nair, UoA	Technical Chair	
Waqar Qureshi, Horizon	Local host & Local Operations Director (on Spl. Request of Conf Chair)	
Doug Ray, Vector	Conference Finance Chair CIGRE NZNC Chair	
Xin Liu, UoA	Digital Delivery and Publicity Director	
Leonie Bule, Transpower	Pacific & Sponsorship Chair	
Mohammad Aldarwesh, UoA	Technology (Hardware) Delivery Director	
Tran The Hoang, UoA	Planning and Roadmap Office Chair	
Rizki Rahani, UoA	Selection & Administration Committee Chair	
Lakshita Lakshita UoA	Webinar and Video Conferencing Director	
Ben Lambourne, Te Awanuiārangi	Site ICT Lead	
Erueti Simpson, Te Awanuiārangi	Production and Broadcast Manager	

WELCOME FROM CONFERENCE TECHNICAL CHAIR

Kia ora koutou katoa

Greetings and I am reaching out to you as CIGRE NZNC Technical Chair, a position created this year to help develop and grow the various local national panels. CIGRE NZNC over the last 3 years has been organizationally developing to implement this strategic direction to reflect its maturity and well-established NC status since our humble beginning in 2007. We have come a long way since 2007 and our organisational structure, as per our constitution and bylaws, technically has centred around six Interest groups representing the 16 CIGRE Study Committees. Since 2019, we have now started-up and developed 9 CIGRE NZNC Panels (5 of them in 2022) and have conducted various panel specific events, workshops, webinars and international papers/presentation. Details and leadership of these panels are provided in the next page.

The annual conferences which we started from Auckland in 2020, coinciding on the eve of CIGRE second Centennial has been a great opportunity to share technical progress developed locally and also engaging international power system expertise, thought-leaders and executives. This year's conference, which is the third for us as NZNC, is the very first time we are hosting it at a regional centre co-partnered with our utility collective member Horizon Energy.

The planning for this conference started from January during the first meeting between Abhinav, Doug, myself and Waqar. Despite all the disruptions due to this pandemic and conducting variety of blended workshops, attendance of CIGRE NZNC contributions in Paris during CIGRE 2022 session and Hamilton during EEA 2022, we have managed to have a coherent





and expert sets of programme for this year's event. The main focus during this year has been towards professional development of our power engineering expertise within NZ and help support life-long learning opportunities for our rich set of industry collective members. During these times of increased needs for workforce recruitment, training and development challenges faced by our industry, hopefully this conference will provide enough technical networking opportunities to hear from our experts locally and internationally.

I believe you will enjoy the third version of our annual CIGRE NZ 2022 Conference.

Nga mihi, and thank you for being with us.

Nirmal Nair

TECHNICAL STUDY COMMITTEE STRUCTURE

The 16 international CIGRE Study Committees are mirrored as Panels and Interest Groups within CIGRE NZ.

NZ Subcommittee		Conveners
NZ.B1	Insulated Cables Subcommittee	André Cuppen
NZ.B2	Overhead Lines Subcommittee	Helen Gilbert
NZ.B3	Substations & Electrical Installations Subcommittee	Doug Ray
NZ.B4	DC Systems and Power Electronics Subcommittee	Geethma Dissanayake
NZ.B5	Protection and Automation Subcommittee	Stephen Chiu
NZ.C6	ADMS and DERMS	Abhinav Chopra
NZ.A2	Power Transformers and Reactors	Dan Martin
NZ.D2	Information Systems & Telecommunications	Abhinav Chopra

WELCOME FROM LOCAL HOST

Tēnā koutou, tēnā koutou, tēnā koutou katoa

On behalf of Horizon Networks and the local community of Eastern Bay of Plenty, it is an honor and pleasure to host CIGRE NZ's inaugural regional CIGRE Conference in the form of CIGRE NZ Annual Conference 2022 in the sunshine capital of New Zealand with a theme of "energy systems for sustainable communities"

We are excited about the partnership with Te Whare Wānanga o Awanuiārangi, CIGRE New Zealand and Horizon Energy Group. We would like to acknowledge the CEO of Te Whare Wānanga o Awanuiārangi, Prof. Wiremu Doherty and his team and Group CEO Horizon Energy Group, Mr. Ajay Anand and his team for their support and contribution.

Horizon Networks, as part of the Horizon Energy Group, owns, manages and operates the electricity network that serves the Eastern Bay of Plenty region.

We're proud to care for a network that covers more than 8,000 kms and supplies more than 25,000 customers, with a maximum demand of 95 MW of electricity.

Horizon Networks is a member of the Horizon Energy Group that is 100% owned by Trust Horizon (formerly Eastern Bay Energy Trust) which was set up to provide funding towards energy-related purposes for consumers on the Horizon Network.

We are excited to take part in this conference on a very timely and important topic of energy systems for sustainable communities. Horizon Networks is committed to enabling a sustainable energy future for the local community of the Eastern Bay of Plenty and New Zealand. We are also committed to playing our role as the key enabler to help achieve the 100% renewable electricity target by 2035 and Net Zero Carbon by 2050 as set by the New Zealand government.





We must achieve this while we navigate through the challenges of climate adverse impacts, workforce challenges, technological changes and the continuously changing regulatory regime.

We hope this conference will be the onset of a collaboration with global knowledge bodies for the New Zealand regional centers which play a vital role in achieving sustainability goals and contributing to New Zealand's economy. We acknowledge CIGRE New Zealand's efforts to bring the inaugural conference to Whakatane and wish the organisers and participants an overly exciting conference.

Nāku iti noa, nā

Waqar Qureshi

CONFERENCE FINANCE CHAIR & CIGRE NZNC CHAIR



Kia ora koutou katoa

On behalf of CIGRE NZ; welcome to our inaugural regional CIGRE NZ 2022 Conference and its focus on “energy systems for sustainable communities”

Thank you Te Whare Wānanga o Awanuiārangi for your invitation to us within your place of learning in Whakatāne. Your koha of your people and venue is outstanding. We are likewise indebted to all our sponsors present at conference for your own generosity and mahi for us.

Thank you to our people at Horizon Energy Group, Counties Energy, and the University of Auckland as our conference organising committee, establishing a cohesive program for an informative, collegiate conference experience for all.

We believe our new energy power systems future is the critical agent for successful sustainable communities we live and work within.

Our motivation is to bring together local and international cross-sector people to share their experience of how technology, practices, and partnerships can benefit equitable energy access and resilience of power supply that benefits our community’s wellbeing and prosperity.

Regional New Zealand exemplifies this sustainable community-based approach that also beneficially leads our net zero-carbon end game.

Our mutual knowledge sharing will assure us of continued progress to meet our needs as sustainable communities here, and across Aotearoa.

Ngā mihi, nā

Doug Ray

PROGRAMME

Tuesday 8th November			Wednesday 9th November			Thursday 10th November			
8:30 - 10:00	 pōwhiri Tea		8:45 - 10:00	Collab Paradigms & State of CIGRE, NZNC, BNC 2022 (Noho Centre) Doug Ray, CIGRE NZ Nirmal Nair, CIGRE NZ Iony Patriota de Siqueira, CIGRE - Brazil		8:45 - 10:00	B1 Symposium Room 101	B2 Symposium Room 104	B5 Symposium Room 204
			10:00 - 10:30 Break						
10:00- 12:30	Optional Site Visits Mercury Geothermal Plant Visit	Master Class on Partial Discharge <u>Dr. Andrew Lapthorn</u> Noho Centre	10:30 - 12:00	Energy Security via DER and orchestration (Noho Centre) - <u>Bobby Cox</u> , Biogas New Zealand - Abhinav Chopra - Kate Murphy - Facilitated by : Nirmal Nair		10:30 - 12:00	B1 Symposium Room 101	B2 Symposium Room 104	B5 Symposium Room 204
			12:00 - 12:30 Lunch Break			12:00-			
12:40	Registration Confirmation Mihi Whakatu		12:30 - 13:30	CIGRE NZ C5 Rm 204 Electricity Markets and Regulation	CIGRE NZ A3 Rm 101 Startup of High Voltage Equipment	12:15	Closing & Wrap-up with Awards		
13:00 - 14:15	Conference Opening Address - Ab, Nirmal Keynote 1 - Ajay Anand (Noho Centre)		13:30 - 14:30	D2: IoT Session (Noho Centre) Ebad Ur Rehman & Abhinav Chopra			Dinner Hosts & Sponsor  Conference Host and Major Sponsors     Gold Sponsor  Media Partners & Emission Calculations  		
14:15 - 15:15	CEO Forum - Noho Centre Ajay Jeff Schlichting Brent (Horizon Helios Hitachi) Facilitated by: Nirmal Nair		14:30 - 15:15	P1: Andre C: Multi-layer Networks for AC/DC					
15:15 - 15:30 Break									
15:30 - 16:45	Pacific Forum - (Noho Centre) Anthony Gee, Hasmukh, Waqar (Vanuatu, Fiji, New Zealand) Facilitated by: Leonie Bule		15:30 - 16:45	P2: Doug Ray: DC Systems Risks					
			Conference Dinner Hosted by Horizon Networks at CIGOL						

Main Stream for Webinar including Master Class

<https://awanuiarangi.zoom.us/j/86955384054?pwd=bFJuZzN2SFBQSGV1RE54ODJTdGUvZz09>

C5, A3 on Wednesday

- a. Room 204: C5 Zoom meeting link:

<https://awanuiarangi.zoom.us/j/81900374472?pwd=TGZKZTNQaTZkTk1uQklDZEJEb0FYZz09>

Password: 338500

- a. Room 101: A3 Zoom meeting link:

<https://awanuiarangi.zoom.us/j/89688133089?pwd=Z0xFa3ZBQnhQWVloRUcvZUx5bENodz09>

Password : 472013

B1, B2, B3 on Thursday

Room 101 : B1 zoom meeting link

<https://awanuiarangi.zoom.us/j/85051802576?pwd=d3NjZUNCWHJmL21XNWILMTAwWlISQT09>

Password: 496928

Room 104: B2 zoom meeting link

<https://awanuiarangi.zoom.us/j/81548825054?pwd=QlprUDZMRUhjSG1CaStuSm55QWhWdz09/>

Password: 115821

Room 204 : B5 zoom meeting link:

<https://awanuiarangi.zoom.us/j/89393294192?pwd=TjNlZCtOK25jWjdIR2xTMnBvQUUs5Zz09>

Password : 640148

CIGRE NZ 2022 CONFERENCE DAY 1

Energy Systems for Sustainable Communities

Tuesday 8 November



MASTER CLASS ON PARTIAL DISCHARGE



Dr. Andrew Laphorn

Duration 3 hours, Noho Centre

Te Whare Wānanga o Awanuiārangi, 13 Domain Road

This seminar is for those interested in the diagnostics measurement of HV and MV equipment. The course will introduce the concept of partial discharge and its effect on insulation systems and provide various options for measuring and interpreting PD results. Methodologies for reducing noise in measurements will also be covered.

The class will cover the following areas/issues.

- Electrical breakdown theory
- What are partial discharges and their effects on the insulation
- Measurement techniques
 - Acoustic
 - Optical
 - Chemical
 - Electrical
- Interpretation of results
- Case studies

Presenter:

Dr Andrew Laphorn, University of Canterbury – High Voltage Laboratory

Andrew is a Senior Lecturer at the University of Canterbury, specialising in electric machine modelling and design. He has collaborated on various electric power research for public and private sector, including high-temperature superconductivity, transformer and electric machine modelling, and high voltage engineering.

This research has enabled him to collaborate with several national and international field experts.

He is a UC principal investigator on two major research grants and an AI on an additional grant. He has supervised over 50 honours, five PhD, and four ME students to completion as the senior supervisor. He is currently the senior supervisor of four PhD and eight honours students.

He is a member of the CIGRE New Zealand A2 panel and WG B1.82 on MVDC cables.

SITE VISIT: MERCURY GEOTHERMAL POWER STATION

The Mercury Energy, Kawerau power station is a 100-megawatt geothermal power plant located just outside the town of Kawerau in the Bay of Plenty region of New Zealand. The power station is situated within the Kawerau geothermal field, which is part of the Taupo Volcanic Zone.



CONFERENCE OPENING



Abhinav Chopra (CEng, PhD, MBA),
Conference Chair

Abhinav heads the Future and Advanced Technology Security Operations Centre, Power and Computer Systems Architecture/Design portfolio working with Space Power Systems, Smart Grid Architecture, Substation Automation Architecture, Power Systems Integration, Communication Systems, OT and ICS Systems, DERMS, ADMS, GIS, Asset Management, Big Data, Blockchain, Distributed Systems, Cloud, Cyber Security, ISA99, IEC 62443, IIoT, IoT, IED. He has helped set standards (ISO/IEC/IEEE) and provides consulting services to critical infrastructure sectors. He is currently with Counties Energy.



Dr. Nirmal Nair

University of Auckland

Nirmal works with the industry to develop proof of value and proof of concepts, to make research practicable, providing cutting edge products that extend the offerings of the New Zealand and International Businesses. He has received his BE in Electrical Engineering from Maharaja Sayajirao University (M.S.U), Baroda, India. He completed his ME in Electrical Engineering with specialization in High Voltage Engineering from Indian Institute of Science (IISc), Bangalore, India. After a decade of professional engineering and lecturing in India he moved to United States where he completed his PhD in Electrical Engineering at Texas A&M University. Since 2004 he has been based in New Zealand.

KEYNOTE 1



Ajay Anand

CEO Horizon Energy Group

Ajay is an experienced and commercially astute executive with over 20 years' experience in senior leadership roles in the utilities and infrastructure sector. He has held his current role as CEO since 2008 and prior to that, he held senior roles at Top Energy and Unison Networks.

Ajay has in-depth knowledge and understanding of the electricity lines business, managing stakeholder expectations, developing new business streams, change management, strategic visioning/positioning, mergers and acquisitions and in building high-performing teams.

During his time with HEG Ajay has led the significant development of the Group to become a significant player as a national infrastructure services provider. The Group currently turns over around \$300M and employs over 1000 staff in New Zealand and Fiji.

Ajay holds a BE from the University of Auckland, • MBA from Henley Business School, in the UK, is Chartered member of IET in the UK and he is also a Chartered Member of the IOD.

CEO FORUM



Brent Rees

Country Managing Director, Hitachi Energy New Zealand

Brent Rees is the Country Managing Director for New Zealand within Hitachi Energy since May 2020.

Brent joined Hitachi Energy's predecessor in 2005 and has worked in various sales and marketing leadership roles within the organization since then. From 2017, Brent also remains responsible for Sales and Marketing for the Hitachi Energy business in New Zealand.

Prior to joining Hitachi Energy, he has held various sales and marketing leadership roles in other industries including Steelmaking, Petrochemicals and Pulp and Paper.

Brent holds a bachelor's degree in Chemical and Materials Engineering and an MBA both from the University of Auckland.



Ajay Anand

CEO Horizon Energy Group

Ajay is an experienced and commercially astute executive with over 20 years' experience in senior leadership roles in the utilities and infrastructure sector. He has held his current role as CEO since 2008 and prior to that, he held senior roles at Top Energy and Unison Networks.

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provider. The Group currently turns over around \$300M and employs over 1000 staff in New Zealand and Fiji.



Jeff Schlichting

Founder & Managing Director, Helios Energy Limited

Jeff Schlichting grew up in rural Kansas where he experienced the endless power of wind and sun while learning the value of hard work. Jeff started in the renewable energy business in 1988, before it was considered a ‘thing’ and was involved in the development, financing, operations and maintenance of some of the earliest projects to utilise renewable and alternative technologies.

Over the years, Jeff has led the successful development of multiple renewable energy projects and advised on the sale and purchase of numerous others. His experience covers a broad range of project development activities, ranging from securing project sites, consents and grid connection to the negotiation of power purchase agreements, project financing, project construction and ongoing operations.

Jeff has a bachelor’s degree from Yale University and is an Edmund Hillary Fellow. He enjoys being on the land, visiting sites, engaging with landowners and the community. Outside of work, you’ll find Jeff looking for adventure and exploring his adopted home, from Cape Reinga to Fiordland.

PACIFIC FORUM

The Pacific Forum develops further the presentations by our Keynote and CEO Forum speakers and the question raised in those sessions.

Conveners explore and challenge a Panel of CIGRE members for ways for us to move forward with the concepts and ideas from these leaders who drive strategy, technology and innovation, to see how we are able to use their organization's challenges and insights to the way we work and engage across the infrastructure landscape and continue to make a difference to our diverse and sustainable energy future in the Pacific by our own contribution within and outside New Zealand.

Our unique times at present have opened the opportunity for different and diverse sectors to come together to partake and help build new and strengthen existing relationships while highlighting the importance of building collaborative partnerships within the energy sector and as well as others.

How will we take the inputs from our speakers today to ensure we make an active difference for the Pacific, is that possible and what might we achieve via our CIGRE connections, expertise, and experience.

Join us to flesh ideas into action we can take away from the conference.



Antony Garae LIU

Director, Department of Energy, Vanuatu

Tony joined the Department of Energy, in September 2013. Tony has considerable experience in the energy sector in Vanuatu including but not limited to other PSIDS countries. Prior to serving as the Director in 2016, Tony serves as the Principle Scientific Officer, Urban Electrification.

Tony is qualified as an Electrical engineer and has an MEng in Power and Energy System Engineering from the Auckland University of Technology. Tony commenced his career in the Vanuatu Telecommunication sector prior to shifting his career path. He initially served as a GSM/Mobile Engineer at Telecom Vanuatu Ltd (Vodafone Vanuatu) and as an ICT Field Engineer at Digicel Vanuatu Ltd. He currently heads the Technology Thematic group for Vanuatu in the Conference of the Party (COP) meetings and is the country's focal point for the International Renewable Energy Agency (IRENA) and the International Solar Alliance (ISA).



Hasmukh Patel

CEO, Energy Fiji Limited

Hasmukh joined the Energy Fiji Limited (EFL) in 1976 as a graduate Electrical Engineer and has served in numerous senior engineering and senior management positions covering technical, field and system operational aspects of electricity networks. Hasmukh left EFL at the end of 2005 as General Manager Network and became the Joint Managing Director of Kasabias Limited from January 2006 to July 2008 before being recalled to the helm of EFL in August 2008, and ever since has been in this role. Hasmukh has a First Class Bachelor of Technology degree in Electrical Engineering from the Indian Institute of Technology, Madras, India and a Graduate Certificate in Management from Monash in Australia. Hasmukh is a Chartered Electrical Engineer and a Member of the Institute of Electrical Engineers, UK and Australia to name a few."



Waqar Qureshi

GM, Horizon Networks

Waqar is the GM for Horizon Networks. He is an experienced Chartered Professional Engineer (CPEng), International Professional Engineer (IntPE) Engineer and Chartered Member of Engineering New Zealand with a demonstrated history of working in the utility industry.

Skilled in Asset Management, Risk Management, Power Systems, Electricity Markets, Transmission Analysis, Renewable Integration, Energy Efficiency, Demand Side Management and Project Management. Strong community, technical and social services professional with a Doctor of Philosophy (Ph.D.) focused on Power Systems from University of Auckland and Project Management Professional (PMP) from Project Management Institute (PMI). Recognized as a Senior Member by IEEE. Past Chair of IEEE PES and PELS New Zealand North Chapter. Past Secretary of CIGRE New Zealand National Committee. Industry Advisor to University of Auckland Power System Engineering Department. Asset Management, Asset Criticality & Health, ISO55001, Asset Management Framework, Asset Strategy, Asset Planning, Systematic Data collection & Advanced Reporting Maintenance Planning and integration of New Technologies in the distribution network are Waqar's growing passions.

CIGRE NZ 2022 CONFERENCE DAY 2

Energy Systems for Sustainable Communities

Wednesday 9 November



COLLABORATION PARADIGMS & STATE OF CIGRE, NZNC, BNC 2022



Iony Patriota de Siqueira

CIGRE Brazil

Iony Patriota de Siqueira holds a PhD (Brazilian Award) and a degree in Electrical Engineering, a MSc degree (honors) in Operational Research, and an MBA in Information Systems. He is a CIGRE Fellow, Honorary Member, Distinguished Member, and past-Chairman of Study Committee B5 of CIGRE, Brazilian member of TC 57 of IEC, President of ABNT Commission on Energy Systems Management and Information Exchange. Author of four books and co-editor and co-author of CIGRE Green Book on Electricity Supply Systems of the Future. Convenor of working groups B5.32, B5.64 and TF B5.01 of CIGRE. Permanent Member of the Brazilian National Academy of Engineering, President of Tecnix Engineering and Architecture, and Technical Director and VP of CIGRE-Brazil.



Doug Ray

CIGRE NZNC

Doug is Chair of CIGRE NZ (2018-), is a CIGRE SC B3 observer member, inaugural convenor of the CIGRE NZ SC B3 mirror Panel and a CIGRE Australia SC B3 mirror Panel contributing representative (2000-). For CIGRE NZ he has co-led Colloquium Special Reporter sessions and contributions at Paris Sessions. Doug has 40+ years of end-to-end power systems multi-disciplinary experience. His role within Vector is electricity distribution asset performance. He has led Vectors power systems project management and engineering teams. As a senior consultant for Parsons Brinkerhoff he won and delivered fast-track engineering projects. Doug also contributes to the NZ Construction Clients Group (2001-) and is their Safety in Design chair.



Dr. Nirmal Nair

University of Auckland

Nirmal works with the industry to develop Proof of Value and proof of concepts, to make research practicable, providing cutting edge products that extend the offerings of the New Zealand Businesses. He has received his BE in Electrical Engineering from Maharaja Sayajirao University (M.S.U), Baroda, India. He completed his ME in Electrical Engineering with specialization in High Voltage Engineering from Indian Institute of Science (IISc), Bangalore, India. After a decade of professional engineering and lecturing in India he moved to United States where he completed his PhD in Electrical Engineering at Texas A&M University. Since 2004 he has been based in New Zealand.

ENERGY SECURITY VIA DER / BIOENERGY & ORCHESTRATION



Brian Cox

Executive officer, Bio Energy Association

For the last decade Brian has been the Executive Officer of the Bioenergy Association. Previously he has worked equally across public policy, commercial development of energy projects, and leading energy associations.

Bioenergy is about the creation of economic growth, employment and environmental benefits from the recycling of biomass and other organic matter. Brian specializes in the development and quality assurance of biomass fuel supply markets and is a sought-after commentator on bioenergy and biofuels sector matters.



Abhinav Chopra (CEng, PhD, MBA),

ISO: IWA 39 Society 6.0

Abhinav heads the Future and Advanced Technology Security Operations Centre, Power and Computer Systems Architecture/Design portfolio working with Space Power Systems, Smart Grid Architecture, Substation Automation Architecture, Power Systems

Integration, Communication Systems, OT and ICS Systems, DERMS, ADMS, GIS, Asset Management, Big Data, Blockchain, Distributed Systems, Cloud, Cyber Security, ISA99, IEC 62443, IIoT, IoT, IED. He has helped set standards (ISO/IEC/IEEE) and provides consulting services to critical infrastructure sectors.



Kate Murphy

Electricity Operations Planned Work Manager, Vector

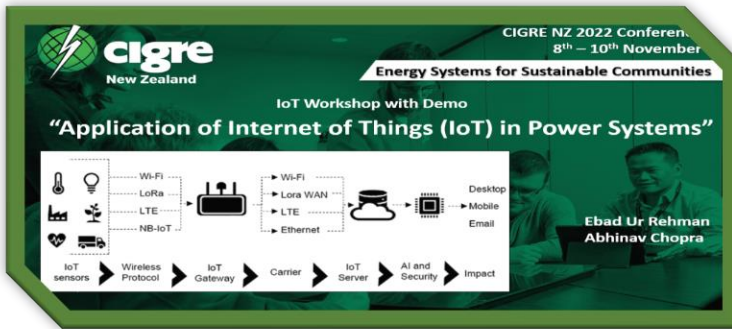
Kate has gained experience with new energy technologies from both sides of the world, and since joining Vector in 2016 and has worked in both the unregulated and regulated side business. Her experience ranges from customer facing grid-scale Solar PV & Battery, network trials of Smart Fault Indicators, Distribution Transformer Monitoring and Smart Meter Data applications. Her current role is in based in Vector's control room, where she manages the transformation of Electricity Operations Planned Work across the Auckland & Northern network Region. She is also currently Chapter Chair of IEEE PES New Zealand North.

CIGRE NZ C5 & A3 PANELS STARTUPS

CIGRE NZ C5 – Electricity Markets will be led by Nirmal Nair and Waqar Qureshi at this event, to formally start the Panel. All are invited to this session.

CIGRE NZ A3 – High Voltage Equipment will be led by Andrew Lapthorn and Andre Cuppen at this event, to formally start the panel. All are invited to this session.

IOT WORKSHOP



Ebad ur Rehman (PhD.)

Power Systems, Power Electronics and IoT Expert



Ebad Rehman leads IoT and Power Electronics areas of innovation and application. He is currently Working at Horizon Networks Whakatane. He has completed his PhD from the University of Auckland. His research funded by 'Resilience to Nature's Challenges' is focused on Asset Management of underground cables factoring resilience. He has worked on resilience and IoT projects with different EDB's in New Zealand. Ebad worked as an electrical sales engineer in Pakistan before gaining his Masters in Electrical Engineering with Power Electronics from the University of Bradford, UK. He worked as a CIGRE NZ B1 NGN member for one year.

Abhinav Chopra (CEng, PhD, MBA),

IIoT , ICS and OT Security Expert



Abhinav heads the Future and Advanced Technology Security Operations Centre, Power and Computer Systems Architecture/Design portfolio working Substation Automation Architecture, Power Systems Integration, Communication Systems, OT and ICS Systems, DERMS, ADMS, GIS, Asset Management, Big Data, Blockchain, Distributed Systems, Cloud, Cyber Security, ISA99, IEC 62443, IIoT, IoT, IED. He has helped set standards (ISO/IEC/IEEE) and provides consulting services to critical infrastructure sectors.

CONFERENCE TECHNICAL PRESENTATIONS

SESSION 1

Andre Cuppen on multilayer networks for AC/DC



Andre Cuppen

PowerCo, New Zealand

André Cuppen possesses thorough knowledge of cable asset management, with 15+ years of experience in managing primary assets in electricity distribution and transmission networks in Australia, New Zealand and the Netherlands. Through 5 years of asset management consultancy working for the world leader in power asset consultancy and testing, DNV KEMA (now DNV Energy and previously KEMA),

CONFERENCE TECHNICAL PRESENTATIONS

SESSION 2

Doug Ray on DC Systems risk based practices for substations



Doug Ray

Vector, New Zealand

Doug is Chair of CIGRE NZ (2018-current), is a CIGRE SC B3 observer member, inaugural convenor of the CIGRE NZ SC B3 mirror Panel and a CIGRE Australia SC B3 mirror Panel contributing representative (2000-). For CIGRE NZ he has co-led Colloquium Special Reporter sessions and contributions at Paris Sessions. Doug has 40+ years of end-to-end power systems multi-disciplinary experience.

CIGRE NZ 2022 CONFERENCE DAY 3

Energy Systems for Sustainable Communities

Thursday 10 November



CIGRE NZ PANEL B1 SYMPOSIUM

**Conference
2022
November 8-10**



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**meet the
symposium
conveners**



André Cuppen
Unison Network

André Cuppen possesses thorough knowledge of cable asset management, with 15+ years of experience in managing primary assets in electricity distribution and transmission networks in Australia, New Zealand and the Netherlands. Through 5 years of asset management consultancy working for the world leader in power asset consultancy and testing, DNV KEMA (now DNV Energy and previously KEMA), André developed an innovative mindset and a keen interest in extending the life of primary power assets, particularly cables. He takes a whole-network view with experience in modelling electricity networks, managing and testing various items of primary equipment, such as transformers, switch-gear, surge arrestors, power cables and accessories.

Join us at CIGRE NZ 2022 Conference by registering at www.cigre.org.nz
Our B5 Panel Symposium led by André Cuppen is on Thursday 10th November 8:45 am to 12:00 pm

B1

Insulated Cables

CIGRE NZ B1 Panel is the expert industry group on insulated cable technology in New Zealand. Its aim is to promote the learning and sharing of best industry practice and developments within the topic of insulated cables. Each year the Panel arranges panel meetings, webinars, symposiums and workshops including cable design, construction, installation, commissioning, failure, maintenance, testing and condition assessment. Established in 2020 the Panel's industry contribution is continually increasing.

2022 Conference November 8-10



www.cigre.org.nz

B1 PANEL SYMPOSIUM

Hosted by Panel Convenor Andre Cuppen

Insulated Cables

Day 3 10th November 2022

8:45 – 9:00		Welcome, B1 background, event rules	Andre Cuppen, Sujay Orpe
9:00 – 9:10	1	Feedback from local working group- cable condition assessment	Kewen Kueh (in person)
9:10 – 10:00	2	Summary of CIGRE Paris B1 sessions	Andre Cuppen (in person)
10:00 – 10:30		MV AC cable manufacturing quality assurance experiences in NZ.	Saddat SHAMSUDDIN (in person)
10:30 – 10:45	3	Break	Everyone
10:45 – 11:45	4	Insulation coordination on LV reticulation	Goran Stojadinovic (online)
11:45 – 12:00	5	Cable Constraint- 33kV Arawa Cables Rotorua	Dheshni Pillay (In person)

CIGRE NZ PANEL B2 SYMPOSIUM

**Conference
2022
November 8-10**



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**meet the
symposium
conveners**



**Helen Gilbert
Beca**

Helen is the Technical Director - Transmission Line Engineering at Beca with over 30 years' experience as a transmission and distribution line specialist. Helen has been involved with all aspects of transmission line construction from feasibility design through to commissioning, of 11 kV to 400 kV lines in NZ and internationally.

Through the CIGRE B2 Panel, Helen is keen to bring together the Network Companies in NZ, and other CIGRE Panels working towards a Framework for connecting Renewables into local distribution networks, and standardising distribution overhead lines designs in NZ. Helen is currently the inaugural CIGRE NZ B2 panel convener.

Join us at our online CIGRE NZ 2022 Conference by registering at www.cigre.org.nz
Our B2 Panel Symposium led by convener Dan Martin is Thursday 10th Nov 8:45 am to 12:00 pm

B2

Overhead Lines

CIGRE NZ B2 Panel specializes in conductors, earth wires, optical cables, and their associated insulators, joints, hardware and accessories; towers including accessories; and tower foundations and earthing systems, and future technologies and methods

2022 Conference November 8-10



www.cigre.org.nz

B2 PANEL SYMPOSIUM

Hosted by Panel Convenor Helen Gilbert

Insulated Cables

Day 3 10th November 2022

8:45 – 9:00		Welcome and Introductions	Andre Cuppen
9:00 – 9:10	1	Introduction to Panel B2 and recap on the Topics of Interest	Helen Gilbert
9:10 – 10:00	2	Getting the CIGRE NZ B2 Panel going	
10:00 – 10:30		Break	
10:30 – 10:45	3	HTLS conductors	Michael Wilson
10:45 – 11:45	4	Transmission line structures with Fiber Reinforced Polymer FRP composite	Helen Gilbert
11:45 – 12:00	5	Wrap up and Close	

CIGRE NZ PANEL B5 SYMPOSIUM

**Conference
2022
November 8-10**



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symposium
conveners**



**Stephen Chiu
Powerco**

Stephen Chiu is the Principal Engineer Protection of Powerco, the largest electricity distributor in New Zealand. He is also a Chartered Professional Engineer (CPEng) and has over 15 years' experience in planning, design and operation of protection and control systems.

Stephen is interested at studying power system modelling, fault analysis and detection of high impedance faults. He has presented his work on analysing and detection of electricity distribution faults at IET APSCOM, EEA(NZ) and IEEE APAP conferences. Stephen holds a ME in electrical and electronic engineering from the University of Canterbury, and a MBA from Massey University. He is currently the inaugural CIGRE NZ B5 panel convenor.

Join us at CIGRE NZ 2022 Conference by registering at www.cigre.org.nz
Our B5 Panel Symposium led by Stephen Chui is on Thursday 10th November 8:45 am to 12:00 pm

B5

Protection and Automation

CIGRE NZ B5 Panel has been active since late 2020. Its aim is to promote the learning and sharing of best industry practice and developments within protection and automation. Each year the Panel arranges panel meetings, webinars, symposiums and workshops on topics such as protection asset management, protection of large scale DER, detection of high impedance faults, and more. The panel forms working groups with other CIGRE B5 international panels to study topics of common interest, and gain from the global community local improvements for all our CIGRE members

2022 Conference November 8-10



www.cigre.org.nz

B5 PANEL SYMPOSIUM

Hosted by Panel Convenor Stephen Chiu, Powerco

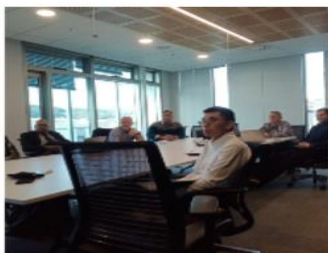
Protection and Automation

Day 3 10th November 2022

8:45 – 8:50	Welcome	Stephen Chiu
8:50 – 9:05	1 News from CIGRE SC B5 including updates from Paris session 2022	Rannveig Løken
9:05 – 10:00	2 Digital Substation - IEC61850	Nirmal Nair and Alex Apostolov
10:00 – 10:30	Break	
10:30 – 10:35	3 Protection of Downed Conductor Faults	Stephen Chiu
10:35 – 10:50	4 Literature Review of Downed Conductor Protection	Niwanthi Nugapitiya
10:50 – 11:00	5 CIGRE NZ WG B5.01 Downed Conductors Survey	Rebecca Shaw
11:00 – 11:20	6 WEL 11kV Feeder Protection & Broken Conductor Detection	Daniel Han
11:20 – 11:40	7 Vector's Experience with HIF Detection	Haydar Abdulmohsen
11:40 – 12:00	8 CIGRE NZ B5 Panel Discussion	All Participants

CIGRE NZ RECENT PHOTOS







CIGRE PREVIOUS EVENTS



INTERNATIONAL COUNCIL
ON LARGE ELECTRIC SYSTEMS
NEW ZEALAND NATIONAL COMMITTEE INC.

CIGRÉ AUCKLAND 2017
11-15 September



Conference Includes: CIGRÉ Women in Engineering Forum
CIGRÉ Next Generation Forum
Technical Tours
Paper Sessions
Trade Exhibits
Tutorials

**HV
Equipment
and
Substations**

**Distribution
Systems
Dispersed
Generation**

**Information
Systems
and
Communications**

**Materials
and
Emerging Test
Techniques**

**Protection
Automation
and
Control**

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CIGRÉ AUCKLAND 2017
University of Auckland, New Zealand
10th – 15th September 2017

**Secure and Efficient Delivery of Energy: Enabled
by World Forum for Power Systems**



CIGRÉ Programme

- Study Committee B5 Colloquium and Annual Meeting
- Asia-Oceania Regional Council Technical Meeting
- Administrative Council Meeting


Plenary & Paper Sessions

Tutorial & Poster Sessions

Administrative & Working Group Meetings

Women in Engineering & Next Generation Network Forums

Trade Exhibits, Tours & Networking



INTERNATIONAL COUNCIL
ON LARGE ELECTRIC SYSTEMS
NEW ZEALAND NATIONAL COMMITTEE INC.



CIGRE NEW ZEALAND 2018

Tuesday 19 June 2018



Cigré New Zealand 2018 – One day event

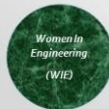
Venue: SkyCity Convention Centre, Auckland

“Secure and efficient delivery of energy”

CIGRE New Zealand 2018 brings together experts and key players from the power system industry across New Zealand. The key events are:

- Keynote Speech by Rob Stephen, President of CIGRE
- Discussion on planned participation by NZ delegates for BIENNIAL CIGRE 2018 PARIS SESSION.
- Workshop / tutorial on emerging technology
- Meeting of CIGRE NZ's six interest groups (encompassing all the 16 CIGRE study committees)
- Women In Engineering (WIE) and Next Generation Network (NGN) meeting

This one day event is wholly sponsored by CIGRE NZ. This event is free subject to registration. A certificate of attendance will be given to participants to use as a Continuing Professional Development (CPD) benefit.



For registration and more information

CIGRE ANZ 2018

Presented by
Platinum Sponsor
of AUPEC 2018



29 November 2018
07:00 - 17:30

Science Centre, 23 Symonds St
University of Auckland



Transitioning New Zealand to a Low-Carbon Energy Future



Meet industry and academia professionals, practitioners, colleagues

Hear from and work with:

- Industry Executives
- Industry Operatives
- Innovation Leaders
- CIGRE Practitioners

Develop your expertise from their progressive experiences in moving towards a low carbon future

In association with AUPEC 2018
(Australasian Universities Power Engineering Conference)

CIGRE 2019 FORUM



Asset Resilience within Electricity Networks

Hear from and network with

- ◆ Industry Executives
- ◆ Industry Operatives
- ◆ Innovation Leaders
- ◆ CIGRE Practitioners

Meet industry and
academia professionals,
practitioners, colleagues

Develop your expertise
from their progressive
experiences in moving
towards a more integrated
asset resilient future



SkyCity Convention Centre
Auckland



24 June 2019
9:00 – 17:00



CIGRE ANZ 2018 exemplar



Spo

CIGRE NZ Webinar Series 2019, 2020

2019

1. Remote indicating overhead line sensors for fault indication, Kate Murphy
2. The Electricity Distribution Sector for Tomorrow, Thahirah Jalal

2020

1. Cable Diagnostics to support Asset Management, Andre Cuppen
2. Enhancing your transformer asset safety and resilience, Dan Martin
3. Transmission Protection With Increased Penetration of Renewables and Distributed Generation, Sheila Matthews

CIGRE NZ 2020 SPECIAL EDITION – PANEL & PODCAST

COVID-19 Power Systems Resilience Response
CIGRE NZ Conversations - April 2020



CIGRE NZ 2020 Conference

CIGRE centennial 2021

**Shaping the power sector
beyond 2020**

5th-6th August 2020

Auckland, New Zealand, and online

CIGRE NZ B1 Symposium

CIGRE NZ A2 Symposium

CIGRE NZ Study Committee updates

CIGRE International selected Study Committee
updates

Presentations on Industry experiences

CIGRE NZ N

Women

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New Zealand

2021 Conference

**November
24-26**

**Building partnerships for
end to end renewable
power systems**





Nga mihi nui
Thank you
Host and Conference Team

