TE PAE, CHRISTCHURCH
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DELIVERING A
NET ZERO CARBON
ENERGY FUTURE

eea | Electricity Engineers' Association

Paper Themes and Context

"Delivering a Net Zero Carbon Energy Future".

Aotearoa New Zealand has committed to reaching net zero emissions by 2050 and an electric future is critical to achieving this target. The pace and scale of change required is unprecedented in history and electricity supply industry is at the start of an exciting and visionary journey.

That's why the EEA2023 Conference is continuing the theme 'Delivering a Net Zero Carbon Energy Future'. We are looking for papers on the challenges and opportunities for our industry as we prepare to play a key part in climate change mitigation and the transformation to a low carbon economy by 2050.

Theme areas include:

- Net zero carbon
- Demand side
- Automation, digitisation, and data-driven future
- Customer-driven change and market engagement
- Sustainability engineering
- Assets management, climate change resilience, and future asset planning
- Enabling distributed energy resources (DER)
- Emerging technology and innovation – artificial intelligence,
- Security and reliability of supply
- Open networks transformation
- Transport energy options
- Future capability requirements
- Safety - critical risks, essential controls and continual improvement
- Smart systems
- Sustainability and environmental

The following are some paper 'topic areas' to consider. (Note: Topics below are NOT in any priority order nor is it an exhaustive list of topics that could be offered).

Emerging Technologies - Opportunities, Integration, and Impacts

- Open networks
- Renewable distributed generation (e.g., solar, wind, micro generation etc)
- Battery storage
- Emerging technology - trials and outcomes
- Electric transport infrastructure
- Demand response and pricing frameworks
- Hydrogen - a future power and energy storage source

- 'Smart opportunities' - cities, homes and appliances
- Micro-grids
- Network stability
- Customer's technologies and smart multi energy solutions
- Artificial intelligence, robotics, and customer technologies
- Pilot projects
- Pump storage

Data and Communications - Challenges and Impacts

- Asset data – frameworks, condition assessment, health indicators, planning and performance metrics
- Automated Demand Response (ADR)
- Machine learning
- LV and HV data for asset and system management
- System modelling and simulation
- Asset forecasting and planning
- Cyber security/data protection
- Unmanned aerial vehicles
- Data visualisation
- Artificial General Intelligence (AGI) , data science and machine learning - operational aspect of the grid.
- Peer-to-peer trading, Blockchain, Big Data, Edge intelligence and The Internet of Things
- SCADA & ADMS

Sustainability Engineering - Management, Optimisation, and Integration

- Asset management - priorities and planning in uncertain times,
- Life cycle engineering
- Interoperability - common platforms, interactions and integrating new technologies and existing assets
- Managing asset risks (e.g. transformers, poles, conductors, switchgear, earthing and substations)
- Ageing Infrastructure - lifecycle and reliability - maintain, refurbish, upgrade or replace?
- Infrastructure design for new technologies and safety
- LV networks - monitoring, modelling and management
- Climate resilience
- Earthing
- Integration of distributed renewables - solar, battery and wind
- Maintenance strategies, standards and issues- poles, conductors, cables and other key assets
- Automation/SCADA/Fault resolution
- Power quality, security and stability
- Projects /case studies
- Work method selection - Live or de-energised

Future Capability

- Future Work
- Delivering on engineering, technical, IT and analytic capability
- Developing/maintaining core skills, capability, and engagement with our people
- Workforce diversity and inclusion - attracting and retaining talent

- Workforce gaps - trends and challenges
- Occupational licencing
- Digitised learning
- Common Competency - opportunities and challenges
- Innovation contracting/service delivery

Net Zero - Drivers for Change

- Climate change
- Regulatory frameworks - economic security and reliability - impacts on customer service, investment, technology,
- Transmission - grid connection, technology, markets, and priorities
- Electrifying transport and the impact on the power system
- Resilience
- International standardisation for NZ adoption of technology, systems and products
- Regional challenges

Consumer/Community Focus & Market Models

- Behind the meter - Impact of smart consumer technology
- Customer/community demand response - aggregators, pricing, demand and resilience
- Distributed energy resource management systems (DeRMS)
- Unlocking customer data for insights on future directions
- Prosumers and future electricity markets

Safety, Health and Environment

- Mental health and wellbeing
- Covid
- Safety Impacts of decarbonization and emerging technologies
- Critical risks - essential control strategies
- LV work management
- Risk frameworks for work method selection
- Monitoring and auditing workplace and public safety
- Shared learnings for better safety performance
- Hazardous substances – Asbestos, SF6