Paper Themes and Context

"Delivering a Net Zero Carbon Energy Future".

Our nation's electric future is one of decarbonisation, deregulation, digitalisation and decentralisation – all of which are critical to achieving net zero emissions by 2050.

The pace and scale of change required is unprecedented bringing a wealth of new opportunities and challenges to overcome.

In 2023, we explored the theme of 'Delivering a Net Zero Carbon Energy Future'. With so much work ahead, we are continuing with this theme again in 2024.

Join us as we work to grow and share our collective knowledge by presenting at EEA2024!

We are seeking presentations from all you forward thinkers, industry experts, futurists, problem solvers and curious minds to help build our knowledge on the challenges and opportunities we face as we transition to a low carbon economy.

Presentation themes could include:

1. Emerging technologies and flexibility
2. Opportunities, Integration, and Impacts
3. Asset management, climate change, resilience, and future asset planning
4. Artificial intelligence, automation, digitisation, data and communication
5. Asset engineering – management, optimisation, and integration
6. Future capability
7. Consumer/Community Focus & Market Models
8. Sustainability and environmental excellence
9. Energy strategy and regulation
10. Enabling distributed energy resources (DER)
11. Security and reliability of supply
12. Safety - critical risks, essential controls and continual improvement

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).

<u>Emerging technologies and flexibility</u>

- Open networks
- Renewable distributed generation (e.g., solar, wind, micro generation, pump storage etc)
- Distributed energy resources (DER) - Battery storage
- Flexibility and aggregators

- Emerging technology - trials and outcomes
- Electric transport infrastructure
- Demand response and pricing frameworks
- Micro-grids
- 'Smart opportunities' - appliances, homes, and cities
- Network stability
- Hydrogen - a future power and energy storage source
- Customer’s technologies and smart multi energy solutions

Asset Management climate change, resilience, and future asset planning

- Asset management – priorities, planning and performance.
- Maintenance strategies, standards, and issues- poles, conductors, cables, and other key assets
- Critical asset management (e.g., transformers, poles, conductors, switchgear, earthing, and substations)
- Ageing Infrastructure - lifecycle and reliability - maintain, refurbish, upgrade or replace?
- Asset and system resilience
- Power quality, security, and stability
- Earthing
- Projects /case studies

Artificial intelligence, automation, digitisation, data and communications

- Asset data – frameworks, condition assessment, health indicators, planning and performance
- 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

Asset Engineering - Management, Optimisation, and Integration

- Interoperability - common platforms, interactions and integrating new technologies and existing assets.
- Distribution system operation
- Life cycle engineering
- Infrastructure design for new technologies and safety
- LV networks - monitoring, modelling and management
- Integration of distributed renewables - solar, battery and wind
- Automation/SCADA/Fault resolution
- Work method selection - Live or de-energised

Future Capability

- Developing/maintaining core skills, capability, and engagement with our people
- Workforce diversity and inclusion - attracting and retaining talent

- Future Work
- Delivering on engineering, technical, IT and analytic capability
- Workforce gaps - trends and challenges
- Occupational licencing
- Digitised learning
- Common Competency - opportunities and challenges
- Innovation contracting/service delivery.

Net Zero - Drivers for Change

- Energy Strategy 2024
- Climate change
- Regulatory frameworks - economic security and reliability - impacts on customer service, investment, technology,
- Grid connection, technology, markets, and priorities
- Electrifying transport and the impact on the power system
- International standardisation for NZ adoption of technology, systems and products

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

- Wellbeing and health
- Safety Impacts of decarbonization and emerging technologies
- Critical risks - essential control strategies/work method selection
- LV work management
- Monitoring and auditing workplace and public safety
- Hazardous substances – Asbestos, SF6