

Report to the CIGRE Australian Technical Council

Study Committee SC B2 and Australian Panel AU B2 Activities



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AU B2 Report 2023
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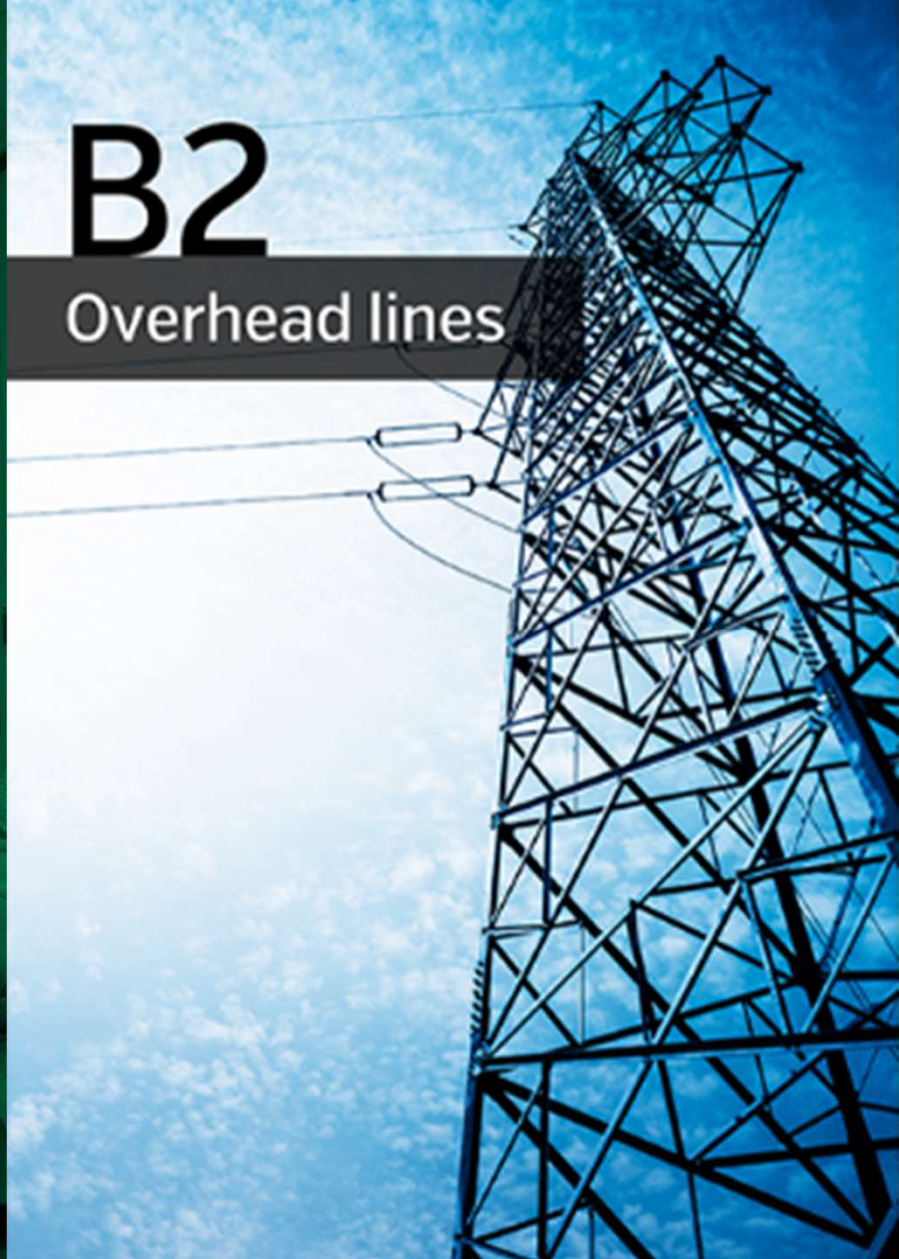


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For power system expertise

B2

Overhead lines



News from CIGRE B2 Overhead Lines

Pierre Van Dyke, SC B2 Chair

6/11/2023



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For power system expertise

SC B2 at a glance

SC B2 is constituted as follows:

- A Chairman
- A Secretary
- Regular Members from 37 countries
- Observers from 17 countries
- WG representation/ participation from 48 countries
- Approx. 8 % female members in WGs

Technical work performed through working bodies (*)

- 2 Advisory Groups
 - Joint Advisory Group B2 and C3 – System Environmental Performance
 - Joint Advisory Group B2 and B1 – Underground Cables and Overhead Transition
- 28 Working Groups
- 3 Joint Working Groups

With participation of approx. 600 experts, Approx. 3% from Next Generation Network (*)

(*) at [Ref Date]

Main Technical Directions – Focus of WGs in SC B2

Main focus areas for currently 28 WGs:

- Safety – 5 WGs
- Electrical Performance – 6 WGs
- Civil/ Structural – 2 WGs
- Asset Management – 4 WGs
- Construction methodology/ handling – 3 WGs
- Assessment of new technologies – 5 WGs
- Risk management, reliability and availability – 3 WGs

Recent publications

WG number	Name of the Publication	Publication details	Year
Green Book	Techniques for Protecting Overhead Lines in Winter Conditions	Published by Springer GB11, 377 Pages	2022
B2.64	Inspection and testing of tools, equipment and training for live-line work on overhead lines	Technical Brochure TB 865	2022
B2.68	Sustainability of overhead line conductors and fittings – Conductor condition assessment and life extension Volume 1: State of the art	Technical brochure TB905	2023
B2.50	Correct handling of fittings and conductors for overhead lines	Technical brochure TB916	2023

Notes:

- B2 has issued 94 Technical Brochures (TB) since 1994
 - 5 TB's have been issued in 2021 and 2022
 - 2 TB's were issued in 2023

Upcoming publications

Technical Brochures under completion/review:

WG number	Name of the Publication
B2/ D2.72	Condition Monitoring & Remote Sensing of OHL
B2.67	Assessment and testing of wood poles
B2.59	Forecasting dynamic thermal line ratings
B2/C4.76	Lightning & Grounding Considerations for Overhead Line Rebuilding and Refurbishing Projects, AC and DC
B2.78	Use of High Temperature Conductors in New Overhead Line Design
B2.79	Enhancing Overhead Line Rating Prediction by Improving Weather Parameters Measurements
B2.80	Numerical Simulation of electrical fields on AC and DC Overhead Line Insulator Strings

Green Books progress:

- “Compact Lines AC and DC R. Stephen & J. Iglesias” is expected in Mid 2024, combines the work from TB792 and TB831

Tutorials and webinars

Year	Date	Type	Title
2023	5/10/2023	Sendai f2f	Lightning & Grounding Considerations for Overhead Line Rebuilding and Refurbishing Projects, AC and DC
2024	TBA	Paris F2f	Forecasting Dynamic Line rating

Most webinars are available at e-cigre.org as recordings

Next planned activities: See Event calendar at cigre.org

Active WGs and JWGs

WG	Title
B2.88	Safety guidelines for OHL construction & maintenance
B2.87	Live line and vicinity working on overhead lines – Safe management guidelines
JWG.C1/B1.86	Approach for Asset Management of Overhead Transmission Lines
B2.85	Emergency Restoration Systems for Overhead Lines – Guide for Design, Planning and Installation
B2.84	Assessment of the methodologies to analyze wind induced overhead line conductors' motion: applications and limitations
B2.83	Mitigation of induced noises by corona activity in overhead AC and DC lines
B2.82	Overhead line foundations for difficult soil and geological conditions
B2.81	Increasing the Strength Capacity of Existing Overhead Transmission Line Structures
B2.80	Numerical Simulation of electrical fields on AC and DC Overhead Line Insulator Strings
B2.79	Enhancing OHL Rating Prediction by Improving Weather Parameters Measurements
B2.78	Use of High Temperature conductors in new OH line design
B2.77	Risk Management of Overhead Line networks: A model for identification, evaluation & mitigation of operational risks
JWG C4/B2.76	Lightning & grounding considerations for OHL rebuilding and refurbishing projects (AC and DC)
B2.75	Application guide for insulated and un- insulated conductors used on medium and low voltage overhead lines
B2.74	Use of unmanned aerial vehicles (UAV's) for assistance with inspections of overhead power lines
B2.73	Guide for prevention of vegetation fires caused by overhead line systems
JWG D2/B2.72	Condition Monitoring and remote sensing of overhead lines
B2.71	Recommendations for Interphase spacer for Overhead Lines
B2.70	Aircraft warning markers and bird flight diverters for overhead lines
B2.69	Coatings for Power Networks
B2.68	Sustainability of OHL, conductors, and fittings – Conductor condition assessment and life extension
B2.67	Assessment and testing of wood and alternative material type poles
B2.66	Safe Handling and Installation Guide for High Temperature Low Sag Conductors
B2.65	Detection, prevention and repair of sub-surface corrosion in OHL supports, anchors and foundations
B2.60	Affordable overhead transmission lines for Sub-Saharan countries
B2.59	Forecasting dynamic line ratings
B2.57	Survey of operational composite insulator experience and application guide for composite insulators
B2.50	Safe handling of fittings and conductors

New works / planned

WG/JWG	Number	Title	Convener Name (Location)
WG	B2.89	Impact of rain upon the characteristics of corona discharge from HV AC and DC overhead transmission lines	Bo Zhang (China)
WG	TBA	OHL construction methodology	Hugo Valente (Portugal)
WGT	TBA	AI augmented based-transmission line inspection and condition assessment	Dr Janos Toth (Canada)
JWG B2/ C3	TBA	Climate Change and impact on OHL design & operations	Asif Bhangor (Australia)
WG	TBA	Transition facilities between overhead and underground lines	Antonio Useros (SPAIN)

Proposed by other SCs

WG/JWG/ TF	Number	Title	Convener Name (Location)
JWG B2/ C3	TBA	Climate Change and impact on OHL design & operations	TBA

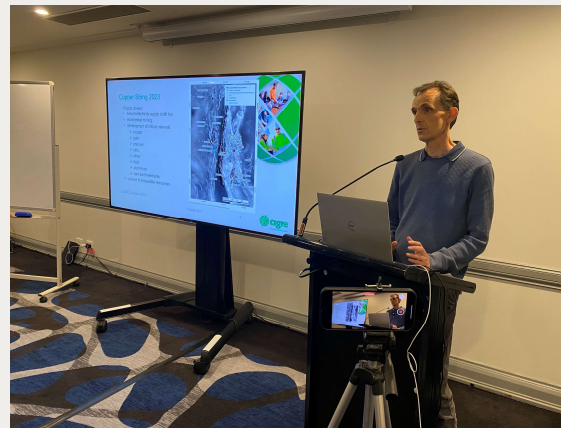
2023 Events

- ANC Participation to CIGRE Sendai Colloquium, led by SC B2
 - ✓ “Recent Overhead Transmission Line Technology and Environmental Measures”, in Sendai (Japan), 3rd - 7th October 2023
 - ✓ Program and details: [CIGRE 2023 COLLOQUIUM \(cigre2023sendai.jp\)](https://www.cigre2023sendai.jp/)
 - ✓ 1 paper presented by Asif Bhangor on “Network Resilience and Regulatory Challenges”
 - ✓ 3 Sessions chaired by ANC B2 Members
 - ✓ 1 Session chaired by ANC NGN Member



2023 Events

- CIGRE Cairns Panel Meeting
 - ✓ Over 35 attendees in Pullman Hotel
 - ✓ 44 attendees online
 - ✓ Venue and facilities sponsor: Energy Queensland and Powerlink
 - ✓ 10 Technical Presentations
 - ✓ 17nos of working group updates by Australian Representatives
 - ✓ Introduction of CIGRE New Zealand for Distribution Lines
 - ✓ KMS training by Rodney Hughes



2023 Events

- CIGRE OMAN Symposium, March 2023
 - Participating committees A3, C6 (Lead), B2 and B4 (Lead)
 - ✓ A3 - Transmission and distribution equipment
 - ✓ C6 – Active Distribution Systems and Distributed Energy Resources (Lead SC)
 - ✓ B2 - Overhead lines
 - ✓ B4 - DC systems and Power Electronics (Lead SC)
 - No participation from B2 Australia
 - Topics covered
 - Driving towards an enhanced system Sustainability, and Resiliency with increasing shares of Renewables
 - Innovations in Future Power Grids in Energy Storage, Electric Vehicles & Digitalization
 - Development in HVDC Grids and Multi-terminal HVDC

Events after 2023

2024

- CIGRE Session in Paris

2025

- Trondheim, Norway - September 2025

(Annual B2 Committee Meeting and Technical meeting to be held in Norway)

Australian Panel AU B2– Overhead Lines

The AU Panel has representatives from AU and NZ

- We are growing
- Currently 46 members, 4 new representatives in the last year

Considerable overhead lines activity throughout both countries

Topics of focus in the AU Panel

500kV Lightning Performance

Planned 500kV construction and associated technical and resource challenges

Failure events in transmission lines – learnings and suggestions

New innovative designs and testing/ adaptation, ease of approvals

An Introduction to EHV and UHV ECLA Applications in China

Asset refurbishment under mining subsidence (longwall mining under powerlines)

Safety systems and design of fall protection

Bushfire impact on electrical and structural systems – prioritising rectification works

Note: NGN presence is growing but requires more involvement in WGs



Australian Panel AU [Panel No.] – [Panel Title]

Topics of interest raised during 2022/23

- Maintenance and aging of HTLS conductors
- Long overhead line span crossings
- AI Augmented image-based TL inspection and condition assessment
- Composite insulated crossarm
- Transition facilities OH lines and underground cables
- Extreme weather events and impact on design of overhead transmission lines

Current focus

- Monitoring, forewarning and melting of ice on transmission lines
- Transposition guidelines and recommendations for overhead lines
- Impact of pollution level of insulator strings for HVDC lines – design operation
- Update on Construction methodologies for Overhead Transmission Lines



Australian Panel AU B2 – Overhead Lines

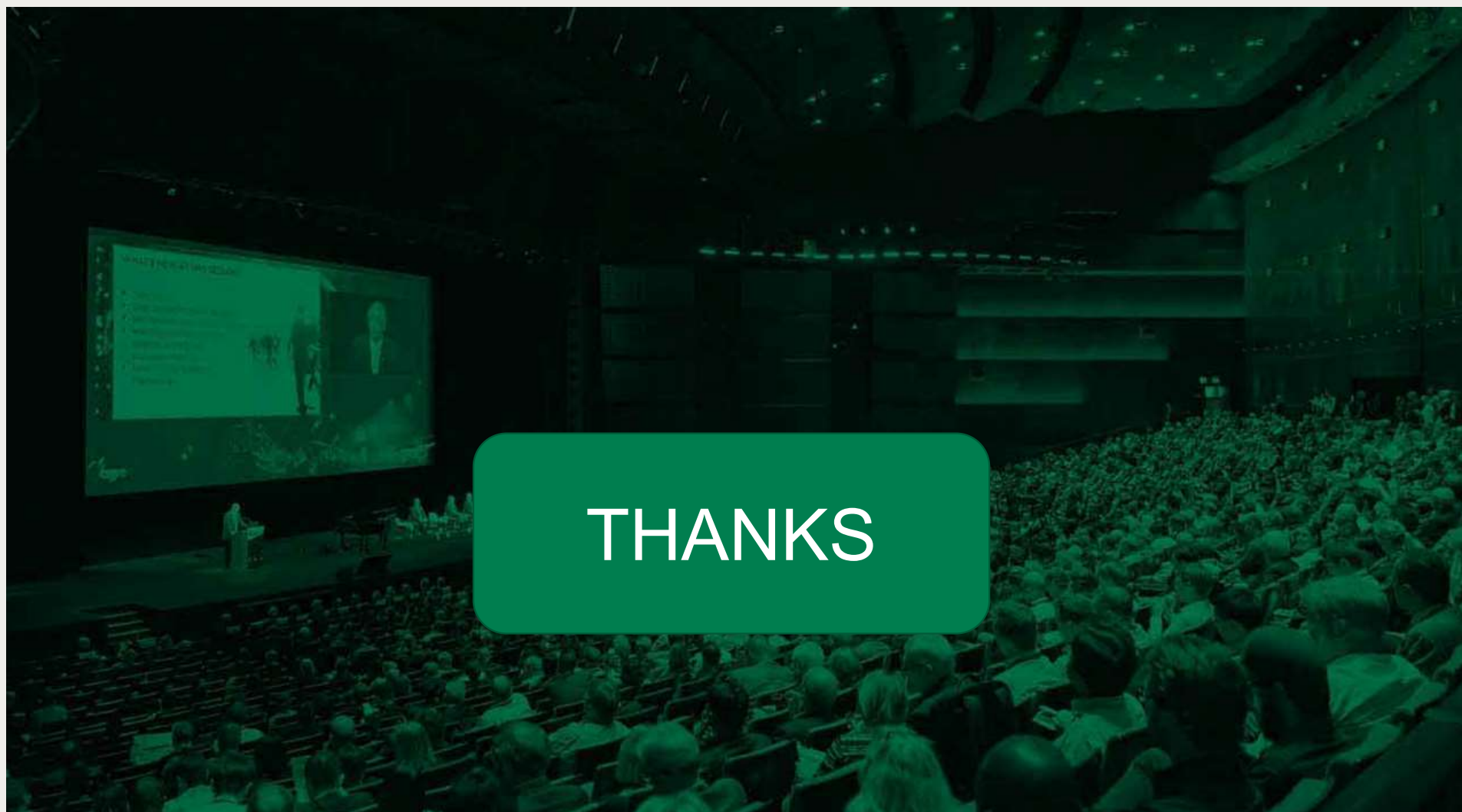
AU B2 Members currently on Working Groups, 5 are Convenors of WGs

WG/TF Number	WG/TF Title	AU Rep
B2.88	Safety guidelines for OHL construction & maintenance	John McCormack (Convenor1)
JWG.C1/B1.86	Approach for Asset Management of Overhead Transmission Lines	Gary Brennan (Representative)
B2.85	Emergency Restoration Systems for Overhead Lines – Guide for Design, Planning and Installation	Bing Lin (Convenor2)
B2.83	Mitigation of induced noises by corona activity in overhead AC and DC lines	Hoang Tong (Representative)
B2.81	Increasing the Strength Capacity of Existing Overhead Transmission Line Structures	Raju Upadhyaya (Representative)
B2.77	Risk Management of Overhead Line networks: A model for identification, evaluation & mitigation of operational risks	Asif Bhangor (Convenor3)
JWG C4/B2.76	Lightning & grounding considerations for OHL rebuilding and refurbishing projects (AC and DC)	Anne Williams (Representative)

Australian Panel AU B2 – Overhead Lines

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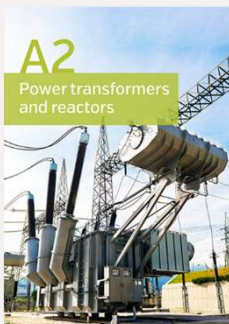
WG/TF Number	WG/TF Title	AU Rep
B2.73	Guide for prevention of vegetation fires caused by overhead line systems	P Dulhunty (Convenor5)
B2.69	Coatings for Power Networks	Francis Lirios (Representative)
B2.68	Sustainability of OHL, conductors, and fittings – Conductor condition assessment and life extension	John McCormack (Representative)
B2.67	Assessment and testing of wood and alternative material type poles	N.Spencer (Convenor4)
B2.66	Safe Handling and Installation Guide for High Temperature Low Sag Conductors	Michael Wilson (Representative)
B2.65	Detection, prevention and repair of sub-surface corrosion in OHL supports, anchors and foundations	John McCormack (Representative)
B2.59	Forecasting dynamic line ratings	John McCormack (Representative)



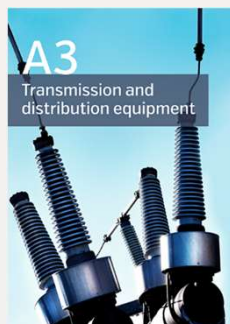
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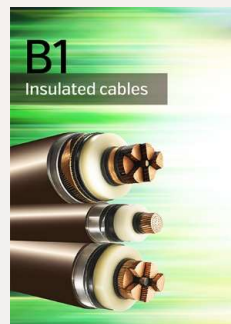
A1
Rotating electrical machines



A2
Power transformers and reactors



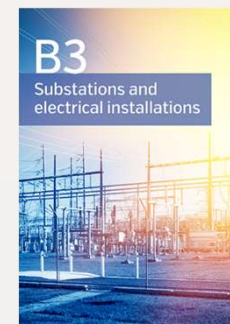
A3
Transmission and distribution equipment



B1
Insulated cables



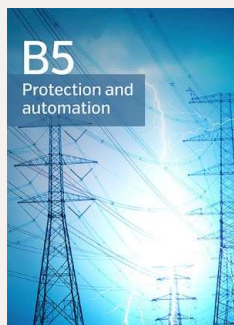
B2
Overhead lines



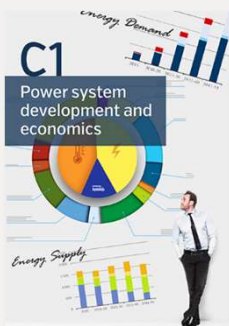
B3
Substations and electrical installations



B4
DC systems and power electronics



B5
Protection and automation



C1
Power system development and economics



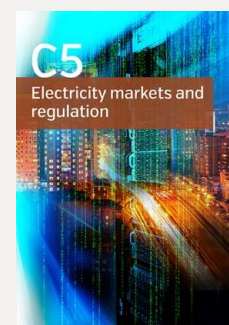
C2
Power system operation and control



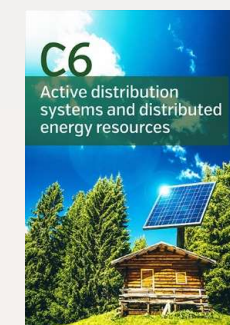
C3
Power system environmental performance



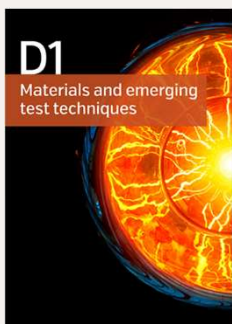
C4
Power system technical performance



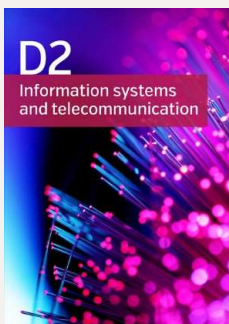
C5
Electricity markets and regulation



C6
Active distribution systems and distributed energy resources



D1
Materials and emerging test techniques



D2
Information systems and telecommunication