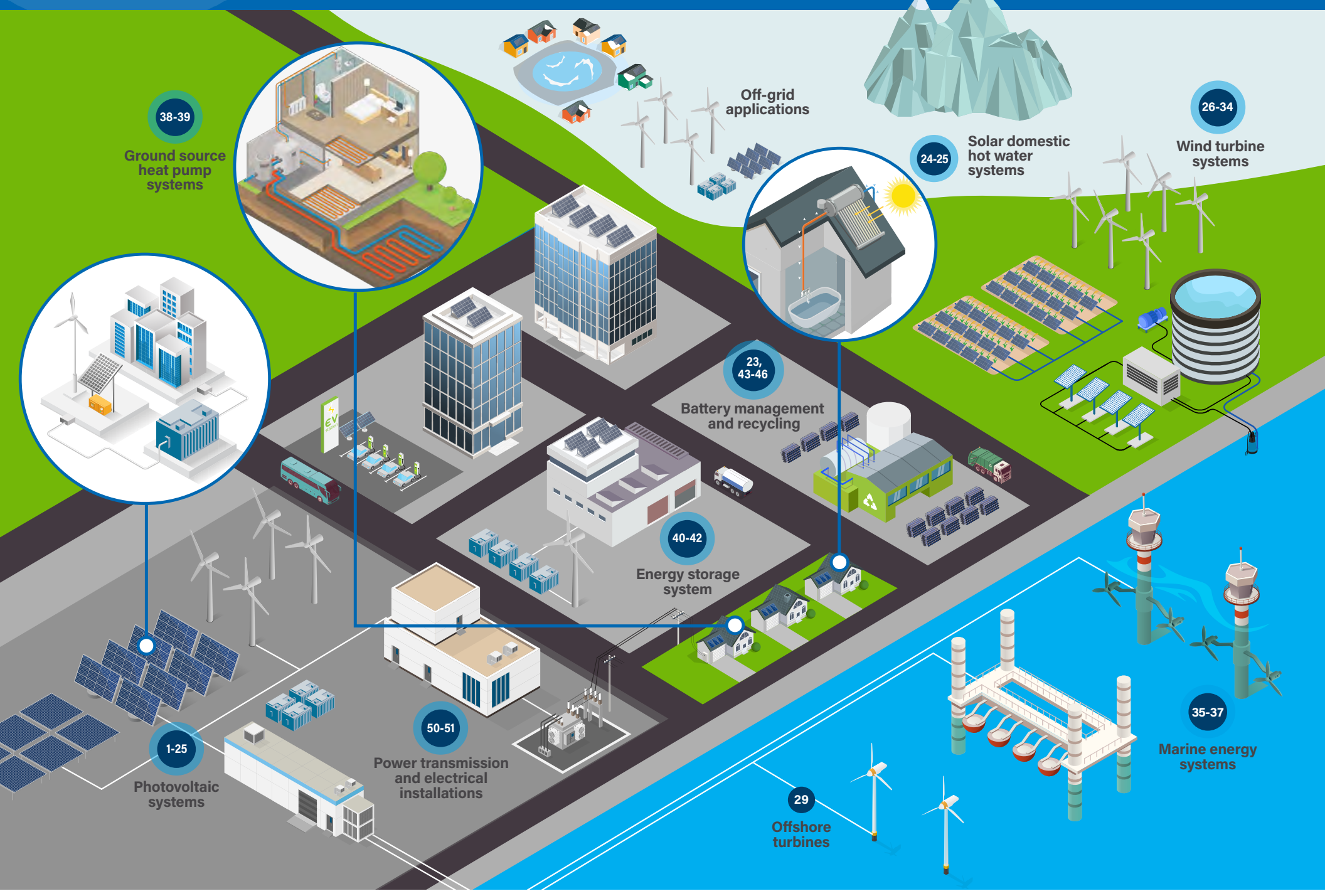
CSA Group Standards for Renewable Energy Generation and Energy Storage Systems

For more than 30 years, CSA Group standards and research help integrate renewable energy resources into Canada's electricity grid to achieve safer, more reliable, and flexible delivery of power to homes, businesses, and industry. CSA Group solutions also help deploy energy storage and smart-grid technologies, further supporting Canada's goals of GHG emission reduction and transition to a net-zero economy.



CSA Group standards and research

Solar photovoltaic and thermal systems

1. **CSA/ANSI C450**, *Photovoltaic (PV) module testing protocol for quality assurance programs*
2. **CSA C62817**, *Photovoltaic systems – Design qualification of solar trackers*
3. **CSA C61215-1**, *Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 1: Test requirements*
4. **CSA C61215-2**, *Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 2: Test procedures*
5. **CSA C22.2 NO. 62109-1**, *Safety of power converters for use in photovoltaic power systems-Part 1: General requirements*
6. **CSA C22.2 No. 62109-2**, *Safety of power converters for use in photovoltaic power systems – Part 2: Particular requirements for inverters*
7. **CSA C22.2 No. 62109-3**, *Safety of power converters for use in photovoltaic power systems – Part 3: Particular requirements for electronic devices in combination with photovoltaic elements*
8. **CSA C22.2 No. 61730-1**, *Photovoltaic (PV) module safety qualification – Part 1: Requirements for construction*
9. **CSA C22.2 No. 61730-2**, *Photovoltaic (PV) module safety qualification – Part 1: Requirements for testing*
10. **CSA C22.2 No. 63092-1**, *Photovoltaics in buildings – Part 1: Requirements for building-integrated photovoltaic modules*
11. **CSA C22.2 No. 63092-2**, *Photovoltaics in buildings – Part 2: Requirements for building-integrated photovoltaic systems*
12. **CSA C22.2 NO. 62790:20**, *Junction boxes for photovoltaic modules – Safety requirements and tests*
13. **CSA C22.2 No. 107.1**, *Power conversion equipment*
14. **CSA C22.2 No. 182.5**, *Photovoltaic connectors*
15. **CSA C22.2 No. 248.19**, *Low-voltage fuses – Part 19: Photovoltaic fuses*
16. **CSA C22.2 No. 290**, *Photovoltaic combiners and recombiners*
17. **CSA C22.2 No. 292**, *DC arc fault protection for photovoltaic applications*
18. **CSA C22.2 No. 304**, *Enclosed and dead-front switches for photovoltaic applications*
19. **CSA C22.2 No. 305**, *Molded-case circuit breakers, molded-case switches, and circuit-breaker enclosures for use with photovoltaic (PV) systems*
20. **CSA C22.2 No. 330**, *Photovoltaic rapid shutdown systems*
21. **CSA C22 No. 4248.19**, *Fuseholders – Part 19, Photovoltaic fuseholders*
22. **CSA TS-900**, *Solar photovoltaic rooftop-installation best practices guideline* (in progress)
23. Photovoltaic (PV) Recycling, Reusing, and Decommissioning (CSA Group research report)
24. **CAN/CSA-F379 SERIES**, *Packaged solar domestic hot water systems (liquid-to-liquid heat transfer)*
25. **CAN/CSA-F383**, *Installation of packaged solar domestic hot water systems*

Wind turbine systems

26. **CSA C22.2 No. 272**, *Wind turbine electrical systems*
27. **CSA C61400-1**, *Wind energy generation systems – Part 1: Design requirements*
28. **CSA C61400-2**, *Wind turbines – Part 2: Small wind turbines*
29. **CSA C61400-3**, *Wind turbines – Part 3: Design requirements for offshore wind turbines*
30. **CSA IEC 61400-11**, *Wind turbines – Part 11: Acoustic noise measurement techniques*
31. **CSA C61400-11-2**, *Wind energy generation systems – Part 11-2: Acoustic noise measurement techniques – Measurement of wind turbine sound characteristics in receptor position* (in progress)
32. **CAN/CSA-IEC 61400-12-1**, *Wind energy generation systems – Part 12-1: Power performance measurements of electricity producing wind turbines*
33. **CSA IEC 61400-24**, *Wind energy generation systems – Part 24: Lightning protection*
34. **PLUS 61400**, *CSA guide to Canadian wind turbine codes and standards*

Marine energy systems

35. **CSA IEC TS 62600-2**, *Marine energy – Wave, tidal and other water current converters – Part 2: Marine energy systems – Design requirements*
36. **CSA IEC/TS 62600-4**, *Marine energy – Wave, tidal and other water current converters – Part 4: Specification for establishing qualification of new technology*
37. **CSA IEC TS 62600-10**, *Marine energy – Wave, tidal and other water current converters – Part 10: Assessment of mooring system for marine energy converters (MECs)*

Ground source heat pump systems

38. **ANSI/CSA/IGSHPA C448 SERIES**, *Design and installation of ground source heat pump systems for commercial and residential buildings*
39. **CSA C748**, *Performance of direct-expansion (DX) ground-source heat pumps*

Energy storage systems

40. **CSA C22.2 NO. 60086-4**, *Primary batteries – Part 4: Safety of lithium batteries*
41. **CAN/CSA-C22.2 NO. 60896-21**, *Stationary lead-acid batteries – Part 21: Valve regulated types – Methods of test*
42. **CSA-C61427-1**, *Secondary cells and batteries for renewable energy storage – General requirements and methods of test – Part 1: Photovoltaic off-grid application*
43. **CSA/ANSI C22.2 NO. 340**, *Battery management systems*
44. **CSA/ANSI C22.2 NO. 350**, *Test method for safety and performance of thermal barriers for use in batteries and battery based energy storage systems*
45. **CSA/ANSI C440**, Series of standards on the performance of thermal energy storage systems used for space heating
46. **CSA/ANSI C800**, *Testing protocol for energy storage system reliability and quality assurance program*
47. **CSA/ANSI C801**, *Testing protocol for evaluating effectiveness of detection and mitigation systems for battery failure events* (in progress)
48. **CSA C888**, *Guideline for the installation and energy performance commissioning of residential behind-the-meter battery energy storage systems (BESS)* (in progress)
49. Circularity and Recycling of Lithium-Ion Batteries for Electric Vehicles – Standardization and Safety Requirements (CSA Group research report)

Power transmission and electrical installations

50. **CSA C22.1**, *Canadian Electrical Code, Part I, Safety standard for electrical installations*
51. **CSA C22.3 No. 9**, *Interconnection of distributed energy resources and electricity supply*

For more information
visit www.csagroup.org/RenewableEnergy

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