Shaping Tomorrow's Built Environment Today

ASHRAE Task Force for Building Decarbonization

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Standard/Code Name	Link to find document	Brief description
ASHRAE Standard 90.1-2019	https://www.ashrae.org/technical-resources/bookstore/standard-90-1	Energy Standard for Buildings Except Low-Rise Residential Buildings
ASHRAE Standard 90.2-2018	https://www.ashrae.org/news/esociety/newly-revised-standard-90-2-includes-new-performance-specifications-more	Standard for Energy-Efficient Design of Low-Rise Residential Buildings; includes performance specifications
ASHRAE Standard 100-2018	https://www.ashrae.org/news/esociety/updated-standard-100-published	Standard for Energy Efficiency in Existing Buildings
ASHRAE Standard 105-2014	https://www.techstreet.com/standards/ashrae-105-2014?product_id=1873278	Standard Methods of Determining, Expressing, and Comparing Building Energy Performance and Greenhouse Gas Emissions
ASHRAE Standard 189.1-2020	https://www.ashrae.org/technical-resources/bookstore/standard-189-1	The International Green Construction Code, a comprehensive building code that not only incorporates life safety issues, it also provides code language for proven green building strategies
ASHRAE Standard 189.3-2017	https://www.techstreet.com/standards/ashrae-189-3-2017?product_id=1952161	Construction, and Operation of Sustainable High-Performance Health Care Facilities
ASHRAE Standard 227P	https://www.ashrae.org/news/esociety/new-ashrae-passive-building-standard-to-boost-use-of-strategy	Passive Building Design Standard – expected to be available in 2021
ASHRAE Standard 228P	https://www.ashrae.org/news/esociety/new-ashrae-zero-energy-standard	Standard Method of Evaluating Zero Energy and Zero Net Carbon Building Performance- provides a consistent method of expressing qualifications for zero net energy and zero net carbon buildings.
ASHRAE Standard 15-2019	https://www.ashrae.org/technical-resources/bookstore/standards-15-34	Safety Standard for Refrigeration Systems, which can reduce greenhouse gas emissions through enabling use of low-GWP refrigerants.

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ASHRAE Standard 34-2019	https://www.ashrae.org/technical-resources/bookstore/standards-15-34	Designation and Safety Classification of Refrigerants, which includes low-GWP refrigerants
New Buildings Institute Building Decarbonization Code	https://newbuildings.org/resource/building-decarbonization-code/	A building decarbonization overlay to the 2021 International Energy Conservation Code (IECC).
Canada Green Building Council CaGBC Zero Carbon Building Standard	https://www.cagbc.org/CAGBC/Zero_Carbon/The_CaGBC_Zero_Carbon_Building_Program.aspx	Nationwide code that also includes embodied carbon and energy use. Includes guidance on district heating cooling and electric. Identifies the importance of two way grid. Envelope commissioning required.
Washington State's Clean Buildings Program	https://www.commerce.wa.gov/growing-the-economy/energy/buildings/	The Clean Buildings bill's objective is to lower costs and pollution from fossil fuel consumption in the state's existing buildings, especially large commercial buildings. It requires implementation of an energy performance standard for existing buildings, based on ASHRAE Standard 100-2018.
City of New York Local law 97	https://www1.nyc.gov/assets/buildings/local_laws/ll97of2019.pdf	A citywide performance code that covers both new and existing buildings focusing in on carbon emission reductions.
WA State Energy Code	https://sbcc.wa.gov/sites/default/files/2020-04/2018%20WSEC_C%202nd%20print.pdf	Statewide energy code with requirements subject to cost effectiveness criteria that includes SC-CO2. Includes whole building and system performance paths that use CO2 emissions as the compliance metric.
New Seattle Building Code	http://www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)/building-code	Washington State Energy Code with Seattle amendments, including limits on fossil fuel and electric resistance space and service water heating.

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2021 Oregon Residential Reach Code	https://www.oregon.gov/bcd/codes-stand/pages/reach.aspx	10-15% improvement in energy efficiency compared to the current 2021 Oregon Residential Specialty Code (ORSC). The Reach code is currently in development and is an opportunity to introduce energy code concepts that may be included in the base building code in future revisions of the code to meet Oregon Executive Order goals of reducing building energy use by 60% as compared to the 2004 ORSC.
2021 Oregon Commercial Reach Code	https://www.oregon.gov/bcd/codes-stand/pages/reach.aspx	10-15% improvement in energy efficiency compared to the current Oregon Structural Specialty Code (OSSC). The Reach code is currently in development and is an opportunity to introduce energy code concepts that may be included in the base building code in future revisions of the code to meet Oregon Executive Order 20-04 goals of reducing building energy use by 60% as compared to the 2004 OSSC.
City of Portland- Healthy Climate Fee	https://www.portland.gov/bps/climate-action/healthy-climate/clean-air-healthy-climate-proposal/healthy-climate-fee	The Healthy Climate Fee establishes a $25 per-ton fee on GHG emissions from facilities in Portland with emissions of 2,500 metric tons of CO2e (carbon dioxide equivalents) per year or greater.
City of Portland- Climate Emergency Declaration	https://www.portland.gov/bps/climate-action/climate-emergency/news/2020/7/1/city-council-adopts-climate-emergency	Establishes goals and climate focus areas of the City of Portland moving forward. Including the City's emission reduction targets to at least 50% reduction in carbon emissions by 2030 and net-zero carbon emissions before 2050.
City of Portland- Residential Energy Scoring	https://www.portland.gov/pdxhes	A policy that requires sellers of most single-family homes in Portland to obtain and disclose a home energy score at time of sale.

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City of Portland- Commercial Benchmarking	https://www.portland.gov/bps/energy-reporting	Policy requires commercial buildings 20,000 square feet and larger to track building energy performance and report this information annually. The goal of this policy is to reduce energy costs and carbon emissions for commercial buildings in Portland in accordance with the Climate Action Plan.
Santa Monica	https://www.smgov.net/Departments/OSE/Categories/Green_Building/Energy_Code_Overview.aspx	Reach Code for Santa Monica, CA. Amended 2019 CA state building code for new homes and commercial buildings. The amendments or "Reach Codes" are designed to encourage low-cost all-electric new construction of healthier, safer, and zero emission buildings while making it easier to charge electric vehicles.
CA- 2019 Building Energy Efficiency Standards	https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency	2019 Building Energy Efficiency Standards improve upon the 2016 Energy Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. are designed to require costeffective measures such as building insulation, efficient lighting and appliances, and air system improvements to reduce building energy use and save energy and maintenance costs over the life of a building. CEC updates the standards every three years; the 2019 edition of the standards require rooftop solar installations on new homes for the first time ever

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City of Vancouver Zero Emissions Program	https://vancouver.ca/green-vancouver/zero-emissions-buildings.aspx	City of Vancouver, BC is transitioning to zero emission buildings in all new construction by 2030. To achieve this, they are setting limits on emissions and energy use in new buildings, and will reduce these limits over time. As of January 1, 2022, new low-rise residential buildings require zero emissions equipment for heating, and additional roof insulation.
BC- Energy Step Code, prescriptive and performance	https://energystepcode.ca/	The BC Energy Step Code is an optional compliance path in the BC Building Code that local governments may use, if they wish, to incentivize or require a level of energy efficiency in new construction that goes above and beyond the requirements of the BC Building Code. Builders may voluntarily use the BC Energy Step Code as a new compliance path for meeting the energy-efficiency requirements of the BC Building Code.
Vancouver- Greenest City Action Plan 2020	https://vancouver.ca/files/cov/greenest-city-action-plan-implementation-update-2018-2019.pdf	Policy plan for Vancouver, BC with a variety of decarbonization improvements to the city including, requiring all buildings constructed from 2020 onward to be carbon neutral in operations.
Orlando FL Community Action Plan	https://www.orlando.gov/files/sharedassets/public/departments/sustainability/2018_orlando_communityactionplan.pdf	A citywide performance code requiring reporting of energy consumption. The scope include both city and private buildings.
Massachusetts Decarbonization Roadmap	https://www.mass.gov/info-details/building-energy-code#stretch-code-summary-	Statewide code for new buildings both commercial and residential. Include moving heating away from fossil fuels. Uses ICC and 90.1 with modifications.

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Clean Atlanta	https://www.100atl.com/	Citywide code that include energy and water reporting. The code includes both solar energy procurement and battery storage. Include clean energy financing program.
Washington DC Net Zero Energy	https://www.energycodes.gov/adoption/states/washington-dc	Citywide code that uses energy modelling and manual reporting. Combination of prescriptive and performance standards. New buildings are expected to hit modelled target 24 months after occupancy.
Midwest Building Decarbonization Coalition	http://www.midwestdecarb.org/	The Midwest Building Decarbonization Coalition seeks to develop and implement equitable strategies to achieve zero emissions from the Midwestern building sector by 2050.
Governor Pritzker's Eight Principles for Clean & Renewable Illinois Economy	https://www.eenews.net/assets/2020/08/24/document_ew_03.pdf	The Governor of Illinois laid out 8 principles for clean and Renewable Energy in the State
Saint Paul Climate Action & Resilience Plan	https://www.stpaul.gov/sites/default/files/Media%20Root/Mayor%27s%20Office/Saint%20Paul%20Climate%20Action%20%26%20Resilience%20Plan.pdf	A framework for the City of St. Paul to address the impact of climate change. City won American Cities Climate Challenge
American Cities Climate Challenge	https://www.bloomberg.org/environment/supporting-sustainable-cities/american-cities-climate-challenge/	The American Cities Climate Challenge provides powerful resources and support to 25 U.S. mayors as they accelerate climate action, using a holistic approach that focuses on clean buildings and transportation.
American Cities Climate Challenge - Columbus, Sustainable Columbus	https://www.columbus.gov/sustainable/cap/	Columbus Ohio's plan created after winning the American Cities Climate Challenge
American Cities Climate Challenge - Chicago. A Building Decarbonization Working Group	https://www.chicago.gov/city/en/depts/mayor/press_room/press_releases/2021/june/DecarbonizationWorkingGroup.html	Chicago, Illinois' plan created after winning the American Cities Climate Challenge
Iowa's Road To 100%Renewable	https://www.iaenvironment.org/webres/File/IEC20002_PathwayTo100Renewable_F_Web.pdf?eType=EmailBlastContent&eId=fa80d800-3072-47b2-8b61-a60b95c4c944	A plan for Iowa to get to 100% Renewable energy by 2050 created by the Iowa Environmental Council

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2021 – 2027 Climate Action Plan	https://www.lincoln.ne.gov/files/sharedassets/public/projects-programs-amp-initiatives/resilient-lincoln/documents/climate-action-plan.pdf	The city of Lincoln, Nebraska's Climate Action Plan with Lincoln specific actionable items related to decarbonization and mitigating and adapting to future climate.
B3 (Buildings Benchmarks and Beyond) and SB2030 Standard (energy and carbon standard)	https://www.b3mn.org/	The B3 tools and programs are designed to help make buildings more energy efficient and sustainable. The B3 programs have been developed for and are required on State-funded projects in Minnesota and are aligned with the goals of the 2030 Commitment/Challenge. Starting in 2020 projects will projects will need to comply with energy and carbon standards. This is a shift from past years, when the requirements were focused on energy usage reductions.
BE086 (Buy Clean and Buy Fair Minnesota Act, pilot bill)	https://www.house.leg.state.mn.us/comm/docs/X-fw4KQ6ikuP1c6PanQpOg.pdf	The bill "Buy Clean and Buy Fair" related to state purchasing; requiring the reporting of the global warming impacts of certain construction materials used in state buildings; proposing coding for new law in Minnesota Statutes, chapter 16B.
HF 278 Climate and Energy Finance and Policy. Electric utility renewable energy standard obligations modified, and Public Utility Commission authority to issue electric generation facility site permits modified.	https://www.revisor.mn.gov/bills/text.php?number=HF278&version=0&session=ls92&session_year=2021&session_number=0	A bill to revise an existing renewable energy standard obligations for utilities.

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pathways to deep decarbonization in Canada	https://electricity.ca/wp-content/uploads/2017/05/DDPP_CAN.pdf	The Deep Decarbonization Pathways Project (DDPP), an initiative of the Sustainable Development Solutions Network (SDSN) and the Institute for Sustainable Development and International Relations (IDDRI), aims to demonstrate how countries can transform their energy systems by 2050 in order to achieve a low-carbon economy and significantly reduce the global risk of catastrophic climate change. Published in 2015
A Healthy Environment and a Healthy Economy	https://www.canada.ca/en/environment-climate-change/news/2020/12/a-healthy-environment-and-a-healthy-economy.html	A Healthy Environment and a Healthy Economy is Canada's plan to build a better future. This plan builds on the Pan-Canadian Framework on Clean Growth and Climate Change. It continues down the path that Canadians, their governments, and businesses have been setting.
Pan-Canadian Framework on Clean Growth and Climate Change (PCF)	https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/climate-change-plan.html	The Pan-Canadian Framework on Clean Growth and Climate Change presented here is our collective plan to grow our economy while reducing emissions and building resilience to adapt to a changing climate. Four main pillars: pricing carbon pollution; complementary measures to further reduce emissions across the economy; measures to adapt to the impacts of climate change and build resilience; and actions to accelerate innovation, support clean technology, and create jobs.

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TransformTO, Net Zero Strategy, and GHG Inventories	https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/transformto/transformto-climate-action-strategy/	TransformTO is Toronto's ambitious climate action strategy. TransformTO will reduce local greenhouse gas emissions, and improve our health, grow our economy, and improve social equity. Everyone will have a part to play in transforming Toronto into a low-carbon city.
Climate Framework: Energy + Carbon; Whole Life Carbon Impacts (for Retrofit and New Build)	https://www.building.co.uk/data/cost-data/whole-life-carbon; https://www.architecture.com/-/media/gathercontent/whole-life-carbon-assessment-for-architects/additional-documents/11241wholelifecarbonguidancev7pdf.pdf; https://www.rics.org/globalassets/rics-website/media/news/whole-life-carbon-assessment-for-the--built-environment-november-2017.pdf	General resource for accessing a collection of content around whole life carbon as it relates to different components/parts of a building and in the context of other topics of health and wellbeing, energy efficiency and circular economy.
European Union Energy Performance of Buildings Directive	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02010L0031-20181224&from=EN	The directive promote policies that will help member countries: (1) achieve a highly energy efficient and decarbonized building stock by 2050; (2) create a stable environment for investment decisions; and (3) enable consumers and businesses to make more informed choices to save energy and money
European Standard EN 15978 Sustainability of construction works. Assessment of environmental performance of buildings. Calculation method	https://www.en-standard.eu/bs-en-15978-2011-sustainability-of-construction-works-assessment-of-environmental-performance-of-buildings-calculation-method/	A calculation method for 'cradle to grave' embodied energy and carbon impacts of buildings.

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European Regulation 2018/1999 - governance of the Energy Union and Climate Action	https://eur-lex.europa.eu/legal-content/EN/TXT/?toc=OJ:L:2018:328:TOC&uri=uriserv:OJ.L_.2018.328.01.0001.01.ENG	Under the Governance Regulation, EU Member States develop integrated national energy and climate plans based on a common template, and synchronized with the ambition cycles under the Paris Agreement. The plans cover the five dimensions of the Energy Union: 1. decarbonization (greenhouse gas reduction and renewables) 2. energy security 3. energy efficiency 4. internal energy market 5. research, innovation and competitiveness
European Climate Law -	https://ec.europa.eu/clima/policies/eu-climate-action/law_en	The European Climate Law writes into law the goal set out in the European Green Deal – for Europe's economy and society to become climate-neutral by 2050 – an economy with net-zero greenhouse gas emissions.
European 2050 Long Term Strategy	https://unfccc.int/sites/default/files/resource/HR-03-06-2020%20EU%20Submission%20on%20Long%20term%20strategy.pdf	Long-term low greenhouse gas emission development strategy of the European Union and its Member States
Climate Protection Policy of the Czech Republic	https://www.mzp.cz/en/climate_protection_policy	The Policy defines main objectives in the climate protection at the national level to ensure the fulfilment of the greenhouse gas emission reduction objectives in order to reach international commitments of the Czech Republic.
Denmark's Long-Term Strategy	https://kefm.dk/Media/3/1/Denmarks%20LTS%20to%20the%20europeancommission%20a-webtilg%C3%A6ngelig.pdf	Long-term strategy outlining Denmark's targets by 2050
Estonian General Principles of climate Policy until 2050	https://www.envir.ee/et/eesmargid-tegevused/kliima/kliimapoliitika-pohialused-aastani-2050-0	Long-term strategy outlining Estonia's targets by 2050
German Climate Action Plan 2050	https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Klimaschutz/klimaschutzplan_2050_kurzf_en_bf.pdf	Long-term strategy outlining Germany's targets by 2050
Italian National Long-Term Strategy	https://ec.europa.eu/energy/sites/ener/files/documents/it_final_necp_main_en.pdf	Long-term strategy outlining Italy's targets by 2050

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Strategy of Latvia for the Achievement of Climate Neutrality by 2050	https://www.climate-laws.org/geographies/latvia/policies/latvia-s-strategy-to-achieve-climate-neutrality-by-2050	Long-term strategy outlining Latvia's targets by 2050
Dutch Long term strategy on climate mitigation	https://www.rijksoverheid.nl/documenten/kamerstukken/2019/11/25/kamerbrief-over-aanbieding-inek-langetermijnstrategie-en-klimaatplan	Long-term strategy outlining The Netherland's targets by 2050
Roadmap for Carbon Neutrality 2050	https://unfccc.int/sites/default/files/resource/RNC2050_PT-22-09-2019.pdf	Long-term strategy outlining Portugal's targets by 2050
Low-Carbon Development Strategy of the Slovak Republic until 2030 with a View to 2050	https://unfccc.int/documents/212913	Long-term strategy outlining Slovakia's targets by 2050
French Integrated National Energy and Climate Plan	https://ec.europa.eu/energy/sites/default/files/documents/fr_final_necp_main_en.pdf	Long-term strategy outlining France's targets by 2050
International Building Energy Code Status	https://bcapcodes.org/code-status/country/	The Building Codes Assistance Project's compendium of existing energy codes for 36 different countries
European Commission Statement on Nearly Zero-Energy Buildings	https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/nearly-zero-energy-buildings_en	The Energy Performance of Buildings Directive (consolidated version) requires all new buildings to be nearly zero-energy by the end of 2020. See entry below for Austria's NZEB regulation. Other EU country's documents are similar.
Austrian Institute of Construction Engineering (OIB) Document defining nearly zero-energy buildings and setting intermediate targets for a national plan	https://ec.europa.eu/energy/sites/default/files/documents/austria-nzeb_en_version_2018.pdf	Establishes minimum energy performance requirements for new construction and renovation
St Louis, MO - Board Bill No. 219	https://www.stlouis-mo.gov/government/city-laws/upload/legislative/boardbills/as-amended/BB219AACombined.pdf	St. Louis' BEPS will require large commercial, multi-family, institutional, and municipal buildings (50,000 sq. ft. and above) to reduce energy use in order to meet an energy performance standard by May 2025, which will be reviewed and updated every four years

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City of Austin Climate Equity Action Plan	https://www.speakupaustin.org/4872/widgets/22575/documents/13638	The Austin Climate Equity Plan proposes the goal of equitably reaching net-zero community-wide greenhouse gas emissions by 2040.
Kansas City Resolution No. 200005	http://cityclerk.kcmo.org/LiveWeb/Documents/Document.aspx?q=Ehj5P3N4QcbDoSJ5SnSPFiURkr4DxOnEeHx2l17h75E%2FAxPuZg%2BAYrjhqSqtDVhZuV%2BCfjajl7qVa3%2BwNCEHSA%3D%3D	Updating the City's Climate Protection Plan to include new greenhouse gas reduction goals, resiliency, and equity and incorporating into City policy and operations; and directing the City Manager to submit the new Climate Protection and Resiliency Plan to Council by March 31, 2021.
Various policies by EIA member countries	https://www.iea.org/policies?sector=Buildings	Summaries (only) of a broad range of policies ranging from appliance efficiencies to lamp wattages to min. energy performance standards
Comprehensive Assessment System for Built Environment Efficiency (CASBEE)	https://www.ibec.or.jp/CASBEE/english/download.htm	A high performance building rating system analogous to LEED and BREEAM
Thailand Energy Efficiency Development Plan	http://www.eppo.go.th/images/POLICY/ENG/EEDP_Eng.pdf	A framework for achieving nationwide energy reduction targets across all major sectors of industry, transportation and buildings.
(Arch 2030) Zero Code 2.0	https://zero-code.org/	A national and international framework for building energy standards for new building construction that integrates cost-effective energy efficiency standards with on-site and/or off-site renewable energy support the construction of zero carbon buildings. It includes prescriptive and performance paths for building energy efficiency compliance based on the highest performing national standards that are available to municipalities and building professionals worldwide.

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NY Stretch Code	https://www.nyserda.ny.gov/All-Programs/Programs/Energy-Code-Training/NYStretch-Energy-Code-2020	A model code for New York jurisdictions to use to meet their energy and climate goals by accelerating the savings obtained through their local building energy codes. Adopted as the base code in NYC.
Australian Government's Carbon Neutral Buildings	https://www.environment.gov.au/climate-change/adaptation/publications/national-climate-resilience-and-adaptation-strategy	The Strategy sets out how Australia is managing climate risks for the benefit of the community, economy and environment. It identifies a set of principles to guide effective adaptation practice and resilience building, and outlines the Government's vision for the future.