Energy Updates in B3: Part 1

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Webinar



Agenda

- Logistics: Webinar and Education Credits
- Background on B3 revisions and timeline
- Approach and intent of revisions
- Guidelines:
 - E.1 Energy Efficiency (More detail on SB 2030 updates during Part 2)
 - E.2 Renewable Energy
 - o E.3 Efficient Equipment and Appliances
 - E.4 Atmospheric Protection
 - \circ E.5 EV-ready
- Questions (collected via the chat) addressed at the end of each guideline and at the end



Logistics

- Training will being recorded, will be posted on our training site at b3mn.org
- Those needing AIA credit please send your AIA # in the chat, to the panelists
- Due to the number of attendees we'll be keeping non-presenters on mute
- Please note questions in the chat as they come up; we'll leave time at the end of each topic to address through those that have come up.





B3 News

B3 Training Website is live!

- Recordings of previous live training sessions
- Slide decks from previous live training sessions
- Today's slides will be posted here



Presentation Slides

Free and downloadable PDFs from previous training sessions - hover to see session name, and click to download



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Learning Objectives

- Understand the importance of metering and documenting different energy uses in the building for comparison to the SB 2030 energy and carbon targets.
- Understand the different requirements governing renewable energy procurement for the SB 2030 and the B3 programs, as well as how building resilience can be improved with on-site renewable energy.
- Be able to describe equipment efficiency requirements, including EnergyStar and the Federal Energy Management Program (FEMP).
- Be able to reference the EPA's Significant New Alternatives Policy (SNAP) for refrigerant selection in the B3 program, as well as understand the new requirements for refrigerant leak detection and reduction.
- Understand the new B3 requirements to ensure electric vehicle ready parking.



B3 Process – providing a feedback loop that works at different scales











Intent of Guideline Revisions

- Bring B3 up-to-date with the latest national standards and green rating systems
- Revise performance standards and requirements to reflect the current state of the building industry in Minnesota
- Reduce the administrative burden for project teams
- Improve the sustainable performance of projects in the future





Timeline of Guideline Revisions

- From 2004 on: 1.1, 2.0, 2.1 (version 2.1 had the tracking Tool replacing workbook)
- Version 2.2—2013
- Version 3.0-2017
- Version 3.1—2019
- Version 3.2—required for projects starting Predesign January 1, 2020. Includes updates to:
 - Energy and Atmosphere
- Upcoming updates: small buildings, small sites, and a resilience overlay

On which version to use:

- The B3 Guidelines now use a Predesign start date to determine which version to use, in order to better permit budgeting projects
- SB 2030 Standard (e.g. 70%-better, 80%-better than baseline) uses Schematic Design to determine which version to use; as reduction increments are known



SB 2030 and B3 Programs

GUIDELINES



Evaluate success of design

strategies through early

and repeated modeling.

Ensure project is meeting performance requirements.

Tools – Tracking Tool and SB 2030 Energy Standard Tool



Fdit



Energy Standard Tool

This tool produces an energy model that simulates the energy use of a 2003 average building of the same function and operation as the SB 2030 project.

This modeled baseline is aligned with the CBECS 2003 Dataset, permitting a wider array of variables to be considered.

The reduction (60%, 70%, 80%, or 90% depending on the year) is then taken from that baseline to determine the SB 2030 Standard.





Energy & Atmosphere Guidelines

To promote the design and operation of energy-efficient buildings to reduce expenditures on imported fuel, reduce the impacts associated with greenhouse gas emissions, minimize negative impacts of refrigerant selection, and ensure readiness for next-generation energy infrastructure.



Guideline E.1A and B: Meet SB 2030

- A. Meet the MN SB 2030 Energy and Carbon Standard. Project submissions, results, and compliance are tracked through the B3 Guidelines Tracking Tool.
- B. Document aggregate totals by energy type for predicted and actual energy use.



Building Energy Consumption from Carbon Producing Fuel



Energy Standard Tool

This tool produces an energy model that simulates the energy use of a 2003 average building of the same function and operation as the SB 2030 project.

This modeled baseline is aligned with the CBECS 2003 Dataset, permitting a wider array of variables to be considered.

The reduction (60%, 70%, 80%, or 90% depending on the year) is then taken from that baseline to determine the SB 2030 Standard.





2020 Program Updates

More detail on this during Thursday's part 2 training, in brief:

- Meet both an energy and carbon standard
- Permit Utility-specific emissions factors
- Implement renewables based on hierarchy, using cost-effective test to move between options
- Cost effectiveness evaluation update
- Hold renovations to the same standard as new construction





Guideline E.1C: Sub-metering

C. Implement submetering and end-load disaggregation.

Separately meter and separately report the following:

- 1. HVAC system electrical energy use.
- Energy use for at least one of the following space conditioning loads: heating, cooling, or ventilation. Metered energy may include natural gas, steam, chilled water, or electricity.
- 3. Interior lighting energy use.
- 4. Exterior lighting energy use.
- 5. Plug loads energy use.
- 6. At least one nonregulated load.





Guideline E.1C Sub-metering

Nonregulated loads:

- Cooking equipment
- Compressed air systems
- Specialized equipment in laboratories, hospitals, and manufacturing plants
- Non-refrigeration related process loads
- If no nonregulated loads, submeter and report one additional regulated load

Regulated loads:

- Heating, cooling, ventilation
- Service water heating
- Motors
- Transformers
- Vertical transportation
- Refrigeration equipment
- Computer room cooling equipment and other systems
- Other components and processes described in ASHRAE 90.1 sections 5 through 10.



Guideline E.1C Sub-metering

Metering requirements for whole-building electrical use, whole HVAC system, interior and exterior lighting, and plug loads are **aligned with ASHRAE 90.1 2013 and ASHRAE 90.1 2016**.

Going beyond ASHRAE 90.1, compliance with Guideline E.1 requires metering and reporting two additional energy loads—one specifically from the HVAC system(s) and a second regulated or nonregulated load. **Meters installed must be capable of reporting data that enable building operators to track energy consumption over time (kWh, BTU, etc.).**



Guideline E.1D: Advanced sub-metering and

Guideline E1E: Real-time energy metering (both recommended)

- D. Advanced submetering
 - 1. Install permanent meters capable of recording and transmitting data to a remote location at one-hour intervals (or less), sufficient to either:
 - i. Meter and report any individual end-use that represents more than 10% of the predicted annual total energy consumption.
 - ii. Meter and report separate energy loads, which together account for at least 90% of predicted annual energy consumption by end-use.
- E. Display real-time energy metering information to building occupants.



Guideline E.1: Questions?





Intent

To facilitate the implementation of onsite renewable energy... to satisfy project energy demand. Greater use of renewable energy reduces atmospheric pollution from fossil fuel-derived energy and can provide a stimulus to the state's economy through investments in local energy jobs and manufacturing. Greater use of renewable energy also reduces the state's expenditures on imported fuel and power.

The language of this guideline is intended to align with existing Minnesota legislation, which requires an economic analysis of onsite solar- and wind-derived renewable energy systems sufficient to offset two percent of predicted energy demand (<u>MN Statute §16B.32, Subd 1a</u>). This mandates the installation of such systems unless explicit reasons are provided that rule out installation.



Guideline E.2A: Renewable Energy

- A. Provide at least two percent of the project's energy needs with onsite solar or wind renewable sources: Eligible wind and solar renewable sources may include:
 - 1. Photovoltaic (PV) solar panels
 - 2. Wind turbines
 - 3. Transpired solar collectors for heating air
 - 4. Solar thermal systems for heating water

Analyze at least two scenarios that include the environmental and economic impacts of supplying two percent of the project's anticipated total energy use with onsite renewable generation systems.





Guideline E.2A: Renewable Energy—LCOE Tool

- The feasibility of meeting this requirement for B3 Guidelines projects shall be determined using the B3 Levelized Cost of Energy (LCOE) Calculator to determine if the levelized cost of wind or solar is less than the combined price of grid and/or fossil fuel-supplied energy and carbon.
- The tool includes several default values for costs at the Predesign phase (including the accepted social cost of carbon) to streamline evaluation. These costs are refined at later phases. Installation of a system meeting two percent of the project's anticipated energy need is required if the evaluation determines that the LCOE from a proposed system is less than the combined price of grid and/or fossil fuel-supplied energy and carbon.
- This is a different evaluation method than is used under the SB 2030 Program to evaluate cost-effectiveness.



Guideline E.2A: Renewable Energy—LCOE Tool

Appendix E-2b: Levelized Cost of Energy Calculator, Design Phase - PV

B3 Guidelines - Version 3.2

KEY:	Blue highlighted areas show constants or outputs calculated by the spreadsheet Yellow highlighted areas show required inputs
Renewable Energy Cost	
Service Life of Equipment (Years)	25 Default 25 years
Yearly Estimated Production (kWh)	17,000 (should be >/= 2% of total building energy use)
Lifetime Production (MWh)	425 MWh (calculated)
Total Installation Cost	\$51,000 Include design, equipment and installation cost
Installation Cost per MWh (over lifetime) Financing Costs per MWh Fuel Costs per MWh Maintenance Costs per MWh (over lifetime)	\$120 Calculated \$0 Usually \$0 for state bonded projects \$0 Usually \$0 for renewable project \$11.40 Use contractor estimate if available; otherwise use default value in user guide
Total Cost/kWh	\$0.131

Utility-delivered Energy Cost	
Cost of kWh	\$0.080 Yearly average price from the utility
Fees, Demand Charges and Surcharges/kWh	\$0.030 All other fees and surcharges based on kWh use
Cost of Carbon/kWh	\$0.024 Based on carbon pricing of \$37/metric ton of carbon
Total Cost/kWh	\$0.134
Results	

Yes

Requirement to Install Renewable Energy



Guideline E.2B: Renewable energy ready

B. Ensure project design is renewable-energy ready: Solar-Ready Roof Requirements

The building must be designed and built to facilitate future installation of solar systems on the building's rooftop. Solar-ready roof planning begins with consideration for location, orientation, height, and massing of the building on the site, with the goal of maximizing exposure for solar systems mounted on the roof.





Guideline E.2B: Renewable energy ready

At a minimum:

- Space on the roof that has unrestricted solar access to the south, is free of obstructions, and is structurally designed accommodate a solar system.
- 2. Roof material with sufficient durability and lifespan to withstand later solar installation and maintenance activities.
- 3. An internal chase (or chases) with rated conduit and/or other means for connecting solar panels.





Guideline E.2B: Renewable energy ready

At a minimum (continued):

- 4. Space within the building for the installation of controls and components.
- 5. Solar-Ready Roof Plan, documenting location and extent of area dedicated for panels, chase location(s), electrical interconnection availability, roof structural capacity, and pertinent roofing product or system information.





Guideline E.2B: Renewable energy ready—site option

The following project constraints are permissible reasons to pursue the alternative renewable energy-ready site requirements, this option must be requested and approved by B3 Guidelines Administrators:

- Shading: If the project's roof area is substantially shaded.
- 2. Prohibitions against solar panels: If the project is located in a historic district, etc.
- If project funding included proceeds from bonds that restrict the use of the building's rooftop for thirdparty solar leases and the two-percent renewable requirement (part A) is met with onsite groundmounted renewable energy.





Guideline E.2B: Renewable energy ready—site option

A renewable energy-ready site shall include:

- A designated area on the site that stays clear of required setbacks and planned building expansions, and has unrestricted solar access to the south, and/or unrestricted access to the prevailing wind directions.
- Buried conduit sized sufficiently to conduct power from the designated area to components and controls located within the building.
- Space within the building that is conveniently located, readily accessible, and reserved for the installation of controls and components.





Guideline E.2B: Renewable energy ready—site option

A renewable energy-ready site shall include (continued):

- Renewable-ready site plan, documenting location and extent of area dedicated for renewable systems, the unrestricted solar or wind access window, buried conduit location, and electrical interconnection availability.
- Verification that local zoning regulations permit the construction and use of renewable energy systems on the building grounds.

If neither site nor rooftop is conducive for wind or solar, contact guidelines@b3mn.org





Guideline E.2C, E2D and E2E: Advanced Energy Targets (recommended)

- C. Achieve 2025 SB 2030 target with additional renewable energy:
 Provide sufficient renewable energy to achieve the building's SB 2030 Energy and Carbon Standard for the year 2025 (using an expanded list of options)
- D. Achieve net-zero energy with additional renewable energy:
 Provide adequate renewable energy to achieve net-zero energy use for the building's energy consumption using any of the resources outlined under E.2C.
- E. Achieve net-zero energy with additional onsite renewable energy: Provide additional onsite renewable energy to achieve net-zero energy use for the building's energy consumption using only onsite or on-campus systems.



Guideline E.2F: Resilient Power Infrastructure (recommended)

- F. Provide resilient power infrastructure capacity by installing either:
 - 1. Grid disconnection capability and photovoltaic system with battery storage.
 - 2. Grid disconnection capability and permanently installed efficient dual-fuel or cleaner-fuel* generator and fuel storage.
 - 3. Grid disconnection and electrical connection point to permit portable generator use.

These systems should be sized to provide emergency power for the project's identified critical loads for a period of three days. If the building is located within the 500-year flood plain, resilient power infrastructure and equipment above the flood elevation should be installed, if building height permits. Also note that if generators are deployed, dual-fuel or cleaner-fuel* (such as natural gas) generators are recommended to reduce airborne pollution.



Guideline E.2: Questions?



Guideline E.3: Efficient Equipment and Appliances

Intent

To reduce energy use associated with equipment and process loads in buildings.





Guideline E.3A: EnergyStar equipment and appliances

A. All equipment and appliances provided as part of the project that have Energy Star Certified Product Categories shall meet Energy Star criteria.





Guideline E.3 Efficient Equipment and Appliances

Energy Star Product Categories:

- Appliances
- Commercial Food Service Equipment
- Data Center Equipment
- Electronics
- Heating and Cooling
- Lighting
- Office Equipment

- Other
 - o Electric Vehicle Chargers
 - Lab Grade Refrigerators and Freezers
 - o Pool Pumps
 - Smart Home Energy Management Systems
 - Vending Machines
 - Water Coolers
- Water Heaters





Guideline E.3B: Equipment efficiency for non-SB 2030 process loads

- B. Equipment relating to process loads which are excluded from the SB 2030 project shall either:
 - Meet or exceed the Federal Energy Management Program (FEMP)-designated energy efficiency level.
 - Document that efficient equipment options have been selected such that no moreefficient alternatives with a 12-year or less simple payback were available.

Process loads excluded from SB 2030 have included energy production and manufacturing processes.



Federal Energy Management Program



Guideline E.3B: Equipment efficiency for non-SB 2030 process loads

FEMP (Federal Energy Management Program) Product Categories:

- Ice Machines, Water-Cooled
- Boilers (Commercial)
- Electric Chillers, Air-Cooled (Commercial)
- Electric Chillers, Water-Cooled (Commercial)
- Exterior Lighting
- Floodlights

FEMP Website -

https://www.energy.gov/eere/femp/search-energyefficient-products

- Fluorescent Ballasts
- Fluorescent Lamps
- Industrial luminaires (High/Low Bays)
- LED luminaires, Commercial and Industrial
- Distribution Transformers





Guideline E.3B: Equipment efficiency for non-SB 2030 process loads

Example FEMP Requirements – Commercial Boilers

Rated Capacity	Fuel	Heating	Thermal Efficiency*
		Medium	(%)
≥300,000 Btu/h and ≤2,500,000 Btu/h	Gas	Hot Water	Et ≥ 95.0
2,500,000 Btu/h and ≤10,000,000 Btu/h	Gas	Hot Water	Et ≥ 94.0
≥300,000 Btu/h and ≤2,500,000 Btu/h	Gas	Steam	Et ≥ 81.0
2,500,000 Btu/h and ≤10,000,000 Btu/h	Gas	Steam	Et ≥ 83.0
≥300,000 Btu/h and ≤2,500,000 Btu/h	Oil	Hot Water	Et ≥ 85.5
2,500,000 Btu/h and ≤10,000,000 Btu/h	Oil	Hot Water	Et ≥ 86.0
≥300,000 Btu/h and ≤2,500,000 Btu/h	Oil	Steam	Et ≥ 84.0
2,500,000 Btu/h and ≤10,000,000 8tu/h	Oil	Steam	Et ≥ 85.5
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Guideline E.3B Equipment efficiency for non-SB 2030 process loads

12-year Payback Compliance Path

Document the follow for each piece of equipment:

- Equipment type
- Equipment cost
- Runtime estimates
- Expected annual energy use
- Expected annual energy cost
- O&M costs (if costs vary between options)
- Any other information required to calculate the simple payback
- Payback calculations



Guideline E.3C: EnergyStar top quartile equipment and appliances (recommended)

C. Select new appliances and equipment that are within the top quartile of efficiency in the corresponding Energy Star Certified Product Category.





Guideline E.3D: In building transportation efficiency (recommended)

- D. In-building transport: When elevators, escalators, or moving walkways are specified:
 - 1. Perform analysis of the transportation demand and usage pattern to determine the optimum size, number, and placement of elevators, escalators, and moving walkways.
 - Estimate the annual energy use for in-building transportation for at least two options for each transport type under consideration. Document that efficient equipment has been selected such that no moreefficient options with a 15-year or less simple payback exist.
 - 3. Specify in-building transportation with energy saving measures, including:
 - i. Elevators: Operate in standby mode during off-peak times, Use a drive controller capable of variable speed, variable frequency control, and variable frequency control of the drive, and/or use of machine room-less traction systems with regenerative drives.
 - Escalators and Moving Walks: Use a load-sensing device that synchronizes motor output to passenger demand and/or uses a passenger-sensing device for automated operation and standby mode.



Guideline E.3: Questions?



Intent

To select refrigerants that reduce environmental impacts, including harm to the environment, risk to human health, and ozone depletion potential.



Refrigerant: Background on importance

- Refrigerants are a large contributor to GHG emissions
- Same functionality can be had with better alternatives
- Leak reduction improves impact on environment and can create savings opportunities for owners and operators.

Table 2. GWPs of Refrigerants and Blowing Agents forDomestic Refrigeration

Chemical	GWP*
Refrigerant	
CFC-12	10,900
HFC-134a	1,430
R-513A	630
R-450A	601
R-441A	<5
HFO-1234yf	4
Propane (R-290)	3.3
Isobutane (R-600a)	3

Chart source: EPA: Transitioning to low GWP Alternatives in Domestic Refrigeration



Guideline E.4A: exclude current SNAP unacceptable refrigerants

A. When selecting equipment, choose refrigerants used in new and repaired equipment not designated "unacceptable" for current application under the Environmental Protection Agency (EPA) Significant New Alternatives Program (SNAP) in order to limit ozone depletion, human health, and Global Warming Potential (GWP) impacts.





SNAP listings

Changing landscape at the federal level—changing EPA requirements and legal challenges related to Rule 20 and 21 (including an April Appeals court decision that restores some restrictions to the use of HFCs).

SNAP acceptability can be referenced at https://www.epa.gov/snap/snap-substitutes-sector.

SNAP Substitutes by Sector

EPA's decision on the acceptability of new substitutes is based on its understanding of the overall risk to the environmental and human health impacts posed by the substitutes as compared with other substitutes available for a particular end-use. For more information about EPA's evaluation of each substitute in an end-use, see the <u>Overview of SNAP</u>.

Substitutes by Industrial Sector



Refrigeration and Air Conditioning

End-uses in this sector typically use a refrigerant in a vapor compression cycle to cool and/or dehumidify a substances or space, like a refrigerator cabinet, room, office building, or warehouse.



Foam Blowing Agents

Foam blowing agents are used in a wide variety of applications including refrigerators, buildings, automobiles, furniture, packaging, and many more. The blowing agent is used to propel liquid plastic resin, and in the case of foam used for

insulation it functions as an insulating component of the foam.



Cleaning Solvents

Cleaning solvents are used to remove oil, grease, solder flux, and other contaminants.



Fire Suppression and Explosion Protection

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SNAP listings (excerpts)

Substitutes in Centrifugal Chillers

You may need a PDF reader to view some of the files on this page. See EPA's About PDF page to learn more.

Substitutes are reviewed on the basis of environmental and health risks, including factors such as ozone depletion potential, global warming potential, toxicity, flammability, and exposure potential. Lists of acceptable and unacceptable substitutes are updated several times each year. The list of substitutes is shown below.

Note: SNAP-related information published in the Federal Register takes precedence over all information on this page.

Show All v entries			Search all columns:				
		Filter by 🗠			Filter by 🗠		
Substitute	Trade Name(s) [⊕]	Retrofit/New θ	<u>odp</u> 0	<u>GWP</u> 0	ASHRAE Designation (Safety Classification)	SNAP Listing θ Date	Listing Status
Ammonia / Water Absorption		N	0	0	B2	March 18, 1994	Acceptable
Ammonia Absorption		N	0	0	82	September 5, 1996; June 16, 2010	Acceptable
Ammonia Vapor Compression		N	0	0	B2	March 18, 1994	Acceptable
Ammonia Vapor Compression with Secondary Loop		N	0	0	82	September 5, 1996; June 16, 2010	Acceptable
Desiccant Cooling		N	0	N/A	N/A	March 18, 1994; June 16, 2010	Acceptable
Evaporative Cooling		N	0	N/A	N/A	March 18, 1994; September 5, 1996 June 16, 2010	Acceptable

HFC134a	R/N	0	1,430	Al	March 18, 1994; June 16, 2010; December 1, 2016	Unacceptable in new equipment, except as otherwise allowed under a narrowed use limit for military marine vessels and human- rated spacecraft and related support equipment, as of January 1, 2024.
HFC-227ea	N	0	3,220	A1	March 18, 1994: June 16, 2010: December 1, 2016	Unacceptable, except as otherwise allowed under a narrowed use limit, as of January 1, 2024.
HFC-236fa	R/N	0	9,810	A1	February 8, 1996; December 1, 2016	Unacceptable in new equipment, except as otherwise allowed under a narrowed use limit, as of January 1, 2024.



Guideline E.4B: Limit refrigerant leakage

- B. Design, maintain, and operate mechanical equipment to reduce refrigerant leakage over the life of the building following updated Clean Air Act Section 608 requirements and guidelines. This is achieved by adhering to the following:
 - 1. Equipment containing 2,000 lbs. or more of refrigerant with a GWP of 150 or greater must include an automatic leak detection (ALD) device.
 - 2. Facilities shall conduct quarterly leak inspections or use ALD devices for equipment containing more than 50 lbs. of refrigerant.



- For equipment containing more than 50 lbs. of refrigerant, leaks must be repaired, subject to a plan for repair, or retired within 30 days of leak detection or refrigerant recharge for thresholds listed in Section 608.
- 4. For equipment containing between five and 50 lbs. of refrigerant, refrigerant recovery recordkeeping requirements must be met per Section 608. For equipment of this size with annual leakage rates of 10% or greater, equipment operators must implement leak reduction measures sufficient to identify and minimize future leaks. Repaired systems must be monitored at least quarterly to ensure leak reduction is maintained.

This guideline uses section 608 structure of leak detection and maintains the pre-2020 requirements (i.e. extending the requirement beyond ozone depleting substances and lowering the threshold of monitoring and remediation).



Guideline E.4C: Exclude future unacceptable SNAP refrigerants and Guideline E.4D: GreenChill Certification (recommended)

- C. At the time of equipment selection, refrigerants used in new and repaired equipment may not be listed as "unacceptable," for *any* future implementation date, under the EPA SNAP in order to limit ozone depletion, human health, and GWP impacts.
- D. GreenChill Certification: Document reduced impact of refrigeration used in food retailing by achieving a platinum, gold, or silver level in the EPA's GreenChill Partnership program.



GreenChill

The GreenChill Partnership

What is the EPA GreenChill Partnership?

GreenChill is an EPA partnership with food retailers to reduce refrigerant emissions and decrease their impact on the ozone layer and climate change.

The 2010 phaseout of certain hydrochlorofluorocarbons (HCFCs), especially HCFC22, marked a major step in the transition to alternative refrigerants and an opportunity to use improved technologies for supermarkets. Because many alternative refrigerants are greenhouse gases (e.g., hydrofluorocarbons – HFCs), it is important during this transition to consider reducing emissions of all refrigerants, not just zoare-depieting substances.

What are the GreenChill Partnership Goals?

The goals of the GreenChill Partnership are to provide supermarkets and other industry stakeholders with information and assistance to:

- · Transition to environmentally friendlier refrigerants;
- Reduce the amount of refrigerant used by stores and eliminate leaks; and
- Adopt green refrigeration technologies and environmental best practices.

Who can Join GreenChill?

GreenChill is a partnership with food retailers, including supermarkets, grocery stores, supercenters, and wholesale clubs. Food retailers sign a Partnership Agreement with EPA and agree to work toward attaining the GreenChill goals.

GreenChill Partners						
rood ketailers						
ACME Markets	Jewel-Osco					
Albertsons Intermountain West	King Kullen					
Bel Air Markets	Lucky/Albertsons Southern California					
BJ's Wholesale Club	McQuade's Marketplace					
Bottom Dollar	Meijer					
Brookshire Grocery Company	Nob Hill Foods Price Channer					
Buehler's Fresh Foods	Publix Super Markets					
Cub Foods	Raley's					
Dorothy Lane Market	Reid's					
Down to Earth	Shaw's/Star Market					
Farm Fresh Food & Pharmacy	Shop 'n Save, St. Louis					
Food Lion	Shoppers Food &					
Food Source	Snrouts Farmers Market					
Fresh & Easy Neighborhood Market	Stater Bros. Supermarkets					
Giant Eagle	SUPERVALU					
Hannaford	Sweethay					
Hanover Co-op Food Stores	Target					
Harris Teeter	Weis Markets					
Harveys	Whole Foods Market					
Hornbacher's	Wild by Nature					
Hy-Vee						
dvanced Refrigeration Technology Manufacturers						
Dow Chemical	Kysor/Warren					
Hilphoenix	Zero Zone					
Hussmann						
Chemical Manufacturers						
Arkema	ICOR International					
ARNEG	Mexichem Fluor					
DuPont	National Refrigerants					
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REENCHILL

NORDATION.



Benefits of the GreenChill Partnership

GreenChill Partners in the food retail business have refrigerant emissions rates nearly 50% lower than the EPA- estimated industry average.

If supermarkets nationwide reduced emissions to the current GreenChill Partner average, they could generate annual cost savings of over \$100 million across the industry, while preventing the annual emission of 27 million metric tons of carbon dioxide equivalent and 230 ozone depletion potential (ODP) tons.

For more information, visit our website at www2.epa.gov/greenchill

Please contact: GreenChill@epa.gov, or Tom Land at (202) 343-9185

Why Join the GreenChill Partnership?

The majority of the approximately 36,000 supermarkets in the U.S. use HCFC-22, an ozone-depleting substance and greenhouse gas, as their primary refrigerant. Further, supermarkets of then have high refrigerant leak rates. Leaks are harmful to the environment and costly to supermarkets. However, ozone-friendly alternative refrigerant and improved technology are available, and servicing practices exist that reduce refrigerant leak rates and emissions.

In addition, under the current regulatory framework, a switch from zone-depleting to non-zone-depleting refrigrams is a logical consideration when remodeling or constructing a new store. While this legat tor un insibile (HCC-22 exploment indefinitely, refrigrant production for servicing that equipment will stop by 2020. The Generic Chill Patneting prisents an opportunity to prepare to this and recognized for efforts above and beyond actions required under the Clean Air ACL Benefits of the GreenChill Patnetship includie:

Environmental benefits	The Partnership helps the environment by decreasing the impact of supermarket refrigeration systems on the ozone layer and climate change.
Benchmarking	A benchmarking system allows Partners to evaluate their progress toward environmental goals in relation to their peers.
Recognition and awards	Awards are given by EPA to recognize outstanding achievements by Partners.
Publicity, marketing, and outreach	Partners have access to a variety of marketing materials to highlight their participation in the GreenChill Partnership.
Assistance with environmental strategies and goals	GreenChill assists Partners in developing and attaining corporate environmental stewardship and sustainability goals, with tools such as best practice guidelines and information on improved technology and servicing practices that help reduce refrigerant charges and leak rates.
Opportunities for information sharing among Partners	GreenChill holds regular meetings to facilitate Partner information sharing on successful emissions reduction strategies and advances in refrigeration technology.
Research	Partners have access to state-of-the-art EPA research and EPA/industry field tests on substitute refrigerants and advanced refrigeration technologies.



Guideline E.4: Questions?



Guideline E.5: EV-Ready

To enable and encourage a

transition to lower-carbon

transportation infrastructure.

100.000 Electric* Propane 80,000 Methanol (M85) LNG Number of Stations Hydrogen 60,000 Biodiesel** CNG E85 40,000 20.000 1992 1996 2000 2004 2008 2012 2016 Last updated: October 2019 Printed on: May 10

U.S. Alternative Fueling Stations by Fuel Type

Chart source: Alternative Fuels Data Center (AFDC), either directly (<u>afdc.energy.gov/stations/states</u>) or from historical Transportation Energy Data Books (<u>www.osti.gov</u>)



Intent

Guideline E.5A: EV-Ready

- A. For projects designated New Construction and Major Renovations that include new or renovated parking areas as part of the project, provide Electric Vehicle Supply Equipment (EVSE) infrastructure to permit future electric vehicle charge stations based on the number of long-term parking spaces. Long-term parking is defined here as parking spaces where typical users are expected to stay more than four hours; short-term parking is defined as parking spaces where typical users are expected to stay for fewer than four hours.
 - If the project includes **five or fewer** total long-term parking spaces, EVSE infrastructure must be provided for at least one space.
 - If the project includes between **five and 50** long-term parking spaces, EVSE infrastructure must be provided for at least 20% of long-term parking spaces.
 - If the project includes **more than 50** long-term parking spaces, EVSE infrastructure must be provided for 10 spaces plus additional spaces equal to 10% of the number of long-term spaces above of 50.

Long-term parking: parking spaces where typical users are expected to stay more than four hours

Short-term parking: parking spaces where typical users are expected to stay for fewer than four hours



Guideline E.5A: EV-Ready, continued

EVSE infrastructure shall be sufficient to support "Level 2" or higher charging technology. EVSE infrastructure shall consist of:

- Dedicated space for future electrical distribution equipment to support EVSE.
- Raceway or equivalent distribution capacity of at least 1 inch diameter, connecting each future EVSE parking space to dedicated electrical distribution location.

Accessible parking spaces should be given consideration when determining access to charging equipment. Projects designated Major Renovations that do not disturb parking surfaces, modify electric distribution to parking areas, or modify electrical equipment in walls or other assemblies adjacent to parking areas may be exempted from this requirement. One DC-fast charging EVSE (including full installation of the equipment) can be used in place of five Level 2 EVSE-ready spaces. If used to replace Level 2 EVSE spaces, this DC-fast charging option should be installed in short-term parking areas, if such areas are included in the project.



Guideline E.5B, E.5C, and E.5D (recommended)

- B. For New Construction and Major Renovation projects, provide EVSE infrastructure for future electric vehicle charging for all of parking areas included in the project. EVSE infrastructure shall consist of the elements outlined under E.5A.
- C. Install EVSE for at least 10% of all spaces. EVSE must be at least Level 2 to meet this guideline.
- D. Install sufficient renewable energy capacity to supply EVSE by installing or enlarging an onsite or on-campus system or by installing additional solar canopy in parking areas. Note that meeting this recommended guideline requires renewable energy capacity in addition to the renewable energy requirements of other guidelines.





Guideline E.5: Questions?



Final Notes

