VERMONT

DEPARTMENT OF PUBLIC SERVICE

Vermont Energy Code Collaborative
CBES Committee Meeting #3

June 15, 2021
9:00 – 11:00

ENERGY FUTURES GROUP

Cx associates LLC

Guidehouse

nbi new buildings institute

Meeting Agenda

1. Overview
   a) Background and Goals of the Collaborative
   b) Introductions
   c) Ground rules, logistics, and use of chat
   d) Meeting schedule
   e) Polling method
2. Today's Topics
   a) Net Zero Definition
   b) Embodied Carbon
   c) Mechanical Equipment
   d) Compliance
   e) Solar Ready/On-site Renewables
   f) EV Charging Stations (time permitting)
3. Next Steps
   a) Take Aways
   b) Continued Input Options

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Background & Goals

- Not enough time to go into depth during the three-year energy code update cycle
- This is your opportunity to dive into critical topics in more depth
- Listening and gathering information to inform decisions
  - Hoping for diverse set of perspectives and opinions
- PSD is the ultimate decision-maker, but feedback and input are essential
- Discuss and provide multiple points of view, don't need to reach consensus

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Introductions in Chat

- Name
- Business
- Town
- Area of expertise

https://pointroadgroup.com/introduce-yourself-virtually-make-strong-impressions/

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Code Team: Who

- Lead State Agency
  - Public Service Department
    - Kelly Launder: Assistant Director
    - Keith Levenson: Energy Program Specialist
    - Barry Murphy: EM&V Program Manager
- Code Update Lead and Residential Code
  - Energy Futures Group
    - Richard Faesy, Gabrielle Stebbins & Liz Bourguet
- Commercial Code Update
  - Guidehouse Consulting
    - Keith Downes & Stu Slote
  - Cx Associates
    - Eveline Killian
- National Insights
  - New Building Institute
    - Jim Edelson & Mark Lyles

Ground Rules

- Respectful listening
- Limit comments to less than 2 or 3 minutes
- Give everyone a turn to say something before speaking up again – may use hand raise feature
- State your name when you make a comment for the notes
- Notes
  - Attributed to speakers for future reference
  - Out for review before posting
- Use the chat to ask questions/ clarifications –not for having separate discussions.

VERMONT
DEPARTMENT OF PUBLIC SERVICE

CBES Meetings & Topics

- First meeting: **May 11th 11:00-1:00**
  - Topics from Survey: CBES Compliance, Mechanical Controls, Additional Efficiency Package C406, Maintenance Information and Systems Commissioning C407
- Second meeting: **June 2nd 2:00-4:00**
  - Topics from Poll: Air Leakage, Electrification, Building Shell Insulation, Existing Buildings
- Third meeting: **June 15th 9:00-11:00**
  - Topics from Poll: Zero Energy, Solar, Renewables, Mech Equip, Embodied Carbon, Compliance

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Meeting Schedule

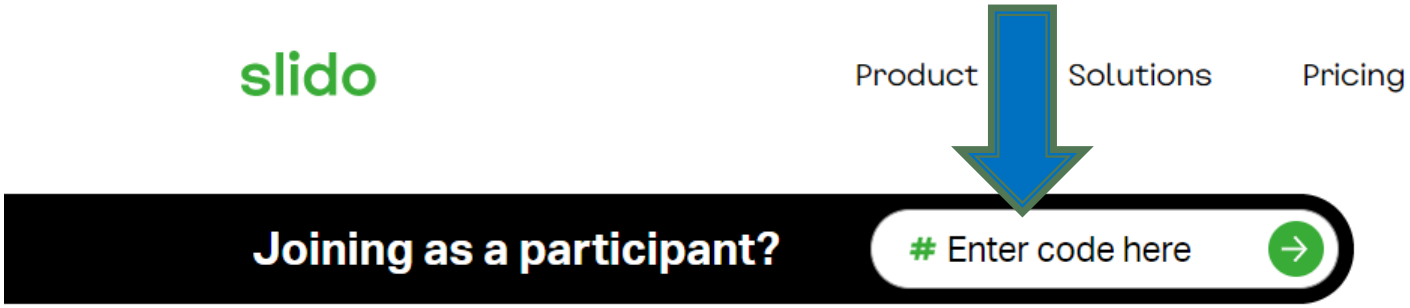
- Cross Cutting
  - #1 – May 4, 11:00 – 1:00
  - #2 – June 8, 11:00 – 1:00
- C&I
  - #1 – May 11, 11:00 – 1:00
  - #2 – June 2, 2:00 – 4:00
  - #3 – June 15, 9:00 – 11:00
- Residential
  - #1 – May 13, 3:00 – 5:00
  - #2 – June 15, 3:00 – 5:00
- Multifamily
  - #1 –June 10, 1:00 – 3:00

Yellow means upcoming

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Polling

- Throughout our discussion, we will be asking you to respond to poll questions
- Before we get started, please go to https://www.sli.do/
- Enter **622382** into the field at the top of the website



- Leave this webpage open throughout our discussion
- We will let you know when it is time to answer a question

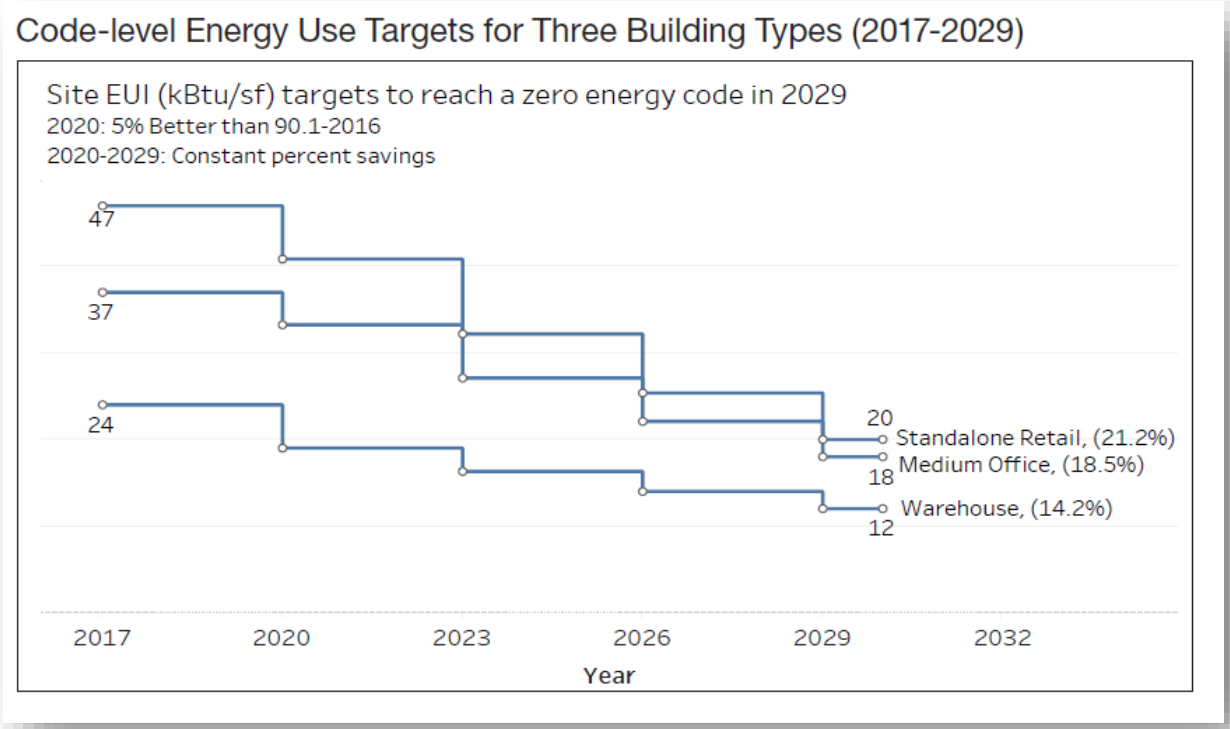
VERMONT
DEPARTMENT OF PUBLIC SERVICE

Net-Zero Ready

VERMONT

DEPARTMENT OF PUBLIC SERVICE

Commercial Targets from 2018 Roadmap



nbi new buildings institute

VERMONT
DEPARTMENT OF PUBLIC SERVICE

US DOE Definition (2016)

Zero Energy Building: An energy-efficient building where, on a source energy basis, the actual annual delivered energy is less than or equal to the on-site renewable exported energy.

Zero Energy Ready Home: A high performance home which is so energy efficient, that a renewable energy system can offset all or most of its annual energy consumption.

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Draft Recommendation for Vermont *Net Zero Ready* definition

Net Zero Ready: A highly efficient and cost-effective building, designed and constructed so that renewable energy could offset all or most of its annual energy consumption. A building that achieves an EUI of X is considered a "highly efficient" building."

X is yet to be defined, but it would vary by at least building type and perhaps by building size.

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Poll: Net-Zero Ready

What *lifetime costs* are you most concerned about in making Vermont commercial buildings "net-zero ready" in the next code cycle?

- Increased insulation level
- Increased window efficiency
- Increased air sealing
- Upgraded electrical service (for solar/storage/EV)
- Upgraded roof structure (for solar)
- Electrification/no fossil fuels
- Other (state in chat)
- Abstain (for Code Update Team)

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Net-Zero Ready Discussion

- Why did you choose your selection?
- What other concern do you have?

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Embodied Carbon

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Embodied Carbon

Simple cost-effective insulation choices can significantly lower a building's embodied carbon emissions (kg CO2e), often equivalent to 5-20 years of operational carbon emissions

Jacob Racusin from New Frameworks recommendations[1] for integrating into Energy Code:

- Keep it simple
- Use established methods (don't reinvent wheel)
- Make it optional, but reward effort
- Focus only on material choices directly associated with Energy Code

1. These recommendations are one stakeholder's proposal and do not represent the PSD's proposed recommendations.

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Embodied Carbon Points

- Simple table, simple calculation in terms of Global Warming Potential (GWP) density (= kg CO2e/sq.ft.)
- Points:

• 1 pt – do it	No effort other than taking time to calculate
• 2 pt – result is less than 0.5 GWP/sf	Moderate effort needed to achieve
• 3 pt – result is less than 0 GWP/sf	Deep effort needed to achieve

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Embodied Carbon Calculation

Assembly	Material	R-value		Sq ft (gross)		Multiplier (from table)		Result (kg CO2e)
Foundation, horizontal (under slab)			X		X		=	
Foundation, vertical			X		X		=	
Above grade walls, cavity			X		X 0.8 X		=	
Above grade walls, continuous			X		X		=	
Roof, flat			X		X		=	
Roof, sloped, cavity			X		X 0.8 X		=	
Roof, sloped, continuous					X			

Material	GWP per 1m^2 RSI-1, kgCO2e	Factor
Straw - panel	-10.88	**-0.178**
Wood fiber - board	-7.13	**-0.117**
HempCrete - block	-5.67	**-0.093**
Cellulose - densepack, 3.55 pcf	-2.16	**-0.035**
Wood fiber - batt	-1.96	**-0.032**
Cellulose - blown/loosefill, 1.29 pcf	-0.83	**-0.014**
Fiberglass - batt	0.68	**0.011**
Fiberglass - blown/loosefill	1.30	**0.021**
Phenolic foam - board	1.54	**0.025**
SPF - open cell	1.59	**0.026**
Fiberglass - blown/spray	1.64	**0.027**
Polyiso - board, foil faced	2.32	**0.038**
EPS board, Type I - 10psi	2.63	**0.043**
Polyiso - board, GRF facers (roof)	2.63	**0.043**
Mineral wool - batt	3.25	**0.053**
EPS board, Type IX - 25psi	3.49	**0.057**
Cellular glass - aggregate	3.93	**0.064**
SPF - closed cell HFO	4.00	**0.065**
Mineral wool - board high density	4.06	**0.066**
SPF - roofing HFO	4.74	**0.078**
Mineral wool - blown	5.18	**0.085**
Fiberglass - board	7.37	**0.120**
XPS - board, 15psi HFO/HFC	7.41	**0.121**
XPS - board, 25psi HFO/HFC	8.83	**0.145**
XPS - board, 40psi HFO/HFC	10.26	**0.168**
XPS - board, 60psi HFO/HFC	12.55	**0.205**
SPF - closed cell HFC	14.86	**0.243**
XPS - board, 100psi HFO/HFC	17.10	**0.280**
SPF - roofing HFC	19.33	**0.316**
SPF - 2K-LP HFC	25.46	**0.416**
XPS - board, 15psi HFC	39.04	**0.639**
XPS - board, 25psi HFC	46.51	**0.761**
XPS - board, 40psi HFC	54.04	**0.884**
XPS - board, 60psi HFC	66.06	**1.080**
XPS - board, 100psi HFC	90.05	**1.473**

Values are from https://www.efficiencyvermont.com/news-blog/whitepapers/the-high-greenhouse-as-price-tag-on-residential-building-materials

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Example: 25'x40', basement plus 2 stories (3000 sf)

Assembly	Material	R-value		Sq ft (gross)		Multiplier (from table)		Result (kg CO2e)
Foundation, horizontal (under slab)	EPS Type IX	10	X	1000	X	0.057	=	570
Foundation, vertical	Polyiso	20	X	1040	X	0.038	=	790
Above grade walls, cavity	FG batts	21	X	2340	X 0.8 X	0.011	=	432
Above grade walls, continuous	Polyiso	12	X	2340	X	0.038	=	1067
Roof, flat	Cellulose	60	X	1000	X	-0.014	=	-840
Roof, sloped, cavity			X		X 0.8 X		=	
Roof, sloped, continuous					X			

Material	GWP per 1m^2 RSI-1, kgCO2e	Factor
Straw - panel	-10.88	**-0.178**
Wood fiber - board	-7.13	**-0.117**
HempCrete - block	-5.67	**-0.093**
Cellulose - densepack, 3.55 pcf	-2.16	**-0.035**
Wood fiber - batt	-1.96	**-0.032**
Cellulose - blown/loosefill, 1.29 pcf	-0.83	**-0.014**
Fiberglass - batt	0.68	**0.011**
Fiberglass - blown/loosefill	1.30	**0.021**
Phenolic foam - board	1.54	**0.025**
SPF - open cell	1.59	**0.026**
Fiberglass - blown/spray	1.64	**0.027**
Polyiso - board, foil faced	2.32	**0.038**
EPS board, Type I - 10psi	2.63	**0.043**
Polyiso - board, GRF facers (roof)	2.63	**0.043**
Mineral wool - batt	3.25	**0.053**
EPS board, Type IX - 25psi	3.49	**0.057**
Cellular glass - aggregate	3.93	**0.064**
SPF - closed cell HFO	4.00	**0.065**
Mineral wool - board high density	4.06	**0.066**
SPF - roofing HFO	4.74	**0.078**
Mineral wool - blown	5.18	**0.085**
Fiberglass - board	7.37	**0.120**
XPS - board, 15psi HFO/HFC	7.41	**0.121**
XPS - board, 25psi HFO/HFC	8.83	**0.145**
XPS - board, 40psi HFO/HFC	10.26	**0.168**
XPS - board, 60psi HFO/HFC	12.55	**0.205**
SPF - closed cell HFC	14.86	**0.243**
XPS - board, 100psi HFO/HFC	17.10	**0.280**
SPF - roofing HFC	19.33	**0.316**
SPF - 2K-LP HFC	25.46	**0.416**
XPS - board, 15psi HFC	39.04	**0.639**
XPS - board, 25psi HFC	46.51	**0.761**
XPS - board, 40psi HFC	54.04	**0.884**
XPS - board, 60psi HFC	66.06	**1.080**
XPS - board, 100psi HFC	90.05	**1.473**

2019 (divided by 3000) = 0.67

This building would get 1 point (for just doing the calculation).

There are various ways it could achieve 2 points; i.e. replacing FG batts with densepack cellulose

VERMONT

DEPARTMENT OF PUBLIC SERVICE

Poll: Embodied Carbon

- Should the Additional Efficiency Packages code section C406 include points for embodied carbon?
  - Yes
  - No
  - Abstain (for code update team)

- Discussion: Why did you choose your selection?
- What other concerns do you have?

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Mechanical Equipment

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Summary of Major Changes in 2020 Code

- New definition for cold-climate heat pump
- New allowances for heat pump systems
- Equipment sizing – to reduce oversizing
- Air conditioner, furnace, boiler, cooling tower, VRF minimum efficiency increase
- ERV required for >3,000 hours and lower CFMs
- Part-load control required on >2HP pumps and fans
- Economizers required in more locations
- Fan efficiency increased
- Fractional HP fan motors require ECM or NEMA premium

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Ventilation Air Clarification

[M] VENTILATION. The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

[M] VENTILATION AIR. That portion of supply air that comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

TABLE C403.7.4
ENERGY RECOVERY REQUIREMENT
(Air systems operating not less than 3,000 hours per year

PERCENT (%) OUTDOOR AIR AT FULL DESIGN AIRFLOW RATE							
≥ 10% and < 20%	≥ 20% and < 30%	≥ 30% and < 40%	≥ 40% and < 50%	≥ 50% and < 60%	≥ 60% and < 70%	≥ 70% and < 80%	≥ 80%
Design Supply Fan Airflow Rate (cfm)							
≥ 10,500	≥ 6,500	≥ 5,500	≥ 4,500	≥ 3,500	≥ 2,000	≥ 1,000	> 120

For SI: 1 cfm = 0.4719 L/s.

"Air" systems = definition of "Ventilation Air"

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Mechanical Equipment Discussion

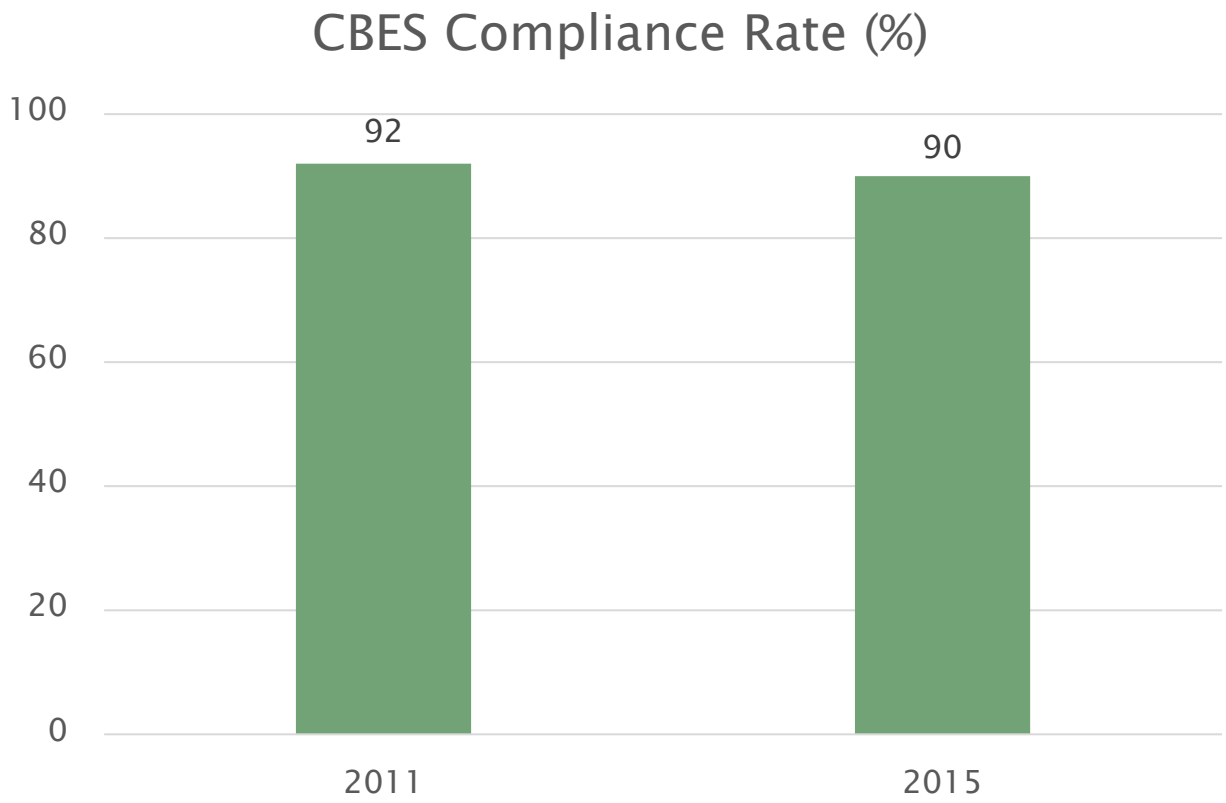
- Topics for Discussion:
  - Heat pumps
  - Boilers
  - Chillers/Cooling Towers
  - Pumps
  - Fans/AHUs
  - ERVs/HRVs
  - Economizers

VERMONT
DEPARTMENT OF PUBLIC SERVICE

» Compliance

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Market Baseline Studies



VERMONT
DEPARTMENT OF PUBLIC SERVICE

Compliance Approach

Proposed Approach	Required Documents
2019 CBES	CBES Certificate and COMcheck
ASHRAE 90.1 – 2016 Sections 5-10 with Amendments	CBES Certificate and COMcheck
ASHRAE 90.1 – 2016 Section 11 – Energy Cost Budget Method	CBES Certificate and all documentation as noted in Section 11.1.5 of ASHRAE 90.1-2016
ASHRAE 90.1 – 2016 Appendix G – Performance Rating Method	CBES Certificate and all documentation as noted in Appendix G of ASHRAE 90.1-2016
	Contact Vermont DPS for approval of above-code program

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Poll: Compliance

- What do you think would be helpful to achieve more compliance? (Make up to 3 selections)
  - Statewide code officials
  - Statewide code assistance (ie. a Help Desk)
  - Better explanations in codes
  - More or more extensive CBES training
  - Training on COMCheck
  - Training on Energy Cost Budget
  - Training on Appendix G
  - Registry for all builders
  - Certification requirements for all builders
  - Licensing for all builders
  - Other (state in chat)
  - Abstain (for code update team)

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Discussion: Compliance

- Discussion: why did you choose your selection?
- Did you attend the in-person CBES trainings?
  - If yes, Did you find the in-person training useful?
- Did you access the video recording CBES training?
  - If yes, Did you find the video recording training useful?
- If you didn't know about the trainings, how can we improve outreach next time?
- What can be done to increase visibility and compliance with C406, Additional Efficiency Package Options?

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Solar Ready and On-Site Renewables

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Summary of Major Changes in 2020 Code

- Definition of renewable energy currently includes solar, methane gas, biomass
- Solar-ready zone defined in Appendix CA, but not required in code.
  - There are exceptions for tall buildings, building orientation, etc.
  - Solar-ready zone area defined
  - Roof loads defined
  - Interconnection pathway
  - Electrical service reserved space
- Points in C406 for installing solar
- On-site renewables were considered for large buildings, but were not included in 2020 CBES

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Poll: Solar and On-site Renewables

- Should solar-ready zones be required in code? (Y/N/Abstain)
- Should solar or on-site renewables be required (with exceptions) for roof areas over 50,000 SF? (Y/N/Abstain)

- Discussion:
  - Why did you choose your selection?
  - Should the definition of renewable energy be revised?

VERMONT
DEPARTMENT OF PUBLIC SERVICE

EV Charging Stations

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Electric Vehicle Charging Stations

Parking spots shall have a socket capable of providing the required level 1 or level 2 charge (see Table C405.11) within 5 feet of the centerline.
50% of the parking spaces, rounded up to the nearest whole number, shall have Electric Vehicle Supply Equipment (EVSE). The remainder shall be pre-wired to allow for installations at such time as they are needed.

Facility Type	Parking Spaces – EVSE plus EVSE-Ready (rounded up to nearest whole number)					
	<25		≥25 Option A		≥25 Option B	
	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2
Groups A&M	0%	0%	0%	4%	0%	10
Groups B, E, F & H	1	1	3%	3%	2%	5
Groups I-1, I-2, I-3 & R-4	1	1	2%	4%	1%	10
Group R-1	0	1	0%	2%	1%	10
Group R-2	1	0	8%	0%	3%	5

Stand alone retail has no requirement for < 50 spaces

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Parking for Electric Vehicle Charging Stations

Parking spaces with EVSE shall be marked for EV use only.
Exception:

1. In Group R-2 buildings the number of parking spaces with EVSE that are marked for “EV use only” need not exceed the number of EV cars driven by occupants of the building. This exception does not reduce the number of EVSE spaces, just the number that are marked for EV use only.

2. In structured parking lots ½ of parking spaces, rounded up, with EVSE shall be marked for “EV use only”, while the remainder need not be marked for “EV use only”. This exception does not reduce the number of EVSE spaces, just the number that are marked for EV use only.

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Poll: EV Charging Stations

- What is the right level of charging station requirements?
  - Remove all requirements
  - Keep EV requirement, but remove EV only parking requirements
  - Keep EV requirement but reduce the number required
  - Keep EV requirement unchanged
  - Increase the EV requirement
  - Abstain (for code update team)
- Discussion: why did you choose your selection?
- Do you have any feedback on the structure of Table C405.11, Electric Vehicle Charging Parking Spaces?

VERMONT
DEPARTMENT OF PUBLIC SERVICE

» Takeaways from Meetings

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Poll: Takeaways

- What is the one thing you want the Energy Code team to remember when the code update cycle begins? (open answer)

- Discussion
  - Why did you select this takeaway for the Code Update Team?
  - What is your takeaway from our discussions?

VERMONT
DEPARTMENT OF PUBLIC SERVICE

» Next Steps

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Further Input?

If you have further input into the 2020 CBES and/or Zero Energy direction of future CBES, please contact us:

- eveline@cx-assoc.com
- keith.downes@guidehouse.com
- Barry.Murphy@vermont.gov

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Thank You for Participating!

Next Meeting:

June 15 – Residential Committee Meeting 3-5 pm

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Appendix

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Definition of Renewable Energy

RENEWABLE ENERGY. Energy produced using a technology that relies on a resource that is being consumed at a harvest rate at or below its natural regeneration rate including, but not limited to, solar hot water, solar hot air, solar photovoltaics, wind, and hydro.

1. Methane gas and other flammable gases produced by the decay of sewage treatment plant wastes or landfill wastes and anaerobic digestion of agricultural products, byproducts, or wastes shall be considered renewable energy resources, but no form of solid waste, other than agricultural or silvicultural waste, shall be considered renewable.
2. The only portion of electricity produced by a system of generating resources that shall be considered renewable is that portion generated by a technology that qualifies as renewable.
3. The following fuels shall not be considered renewable energy supplies: coal, oil, propane, and natural gas.
4. Biomass is considered renewable.

ASHRAE 90.1 – 2016 Performance Rating method used for energy modeled buildings (Appendix G)

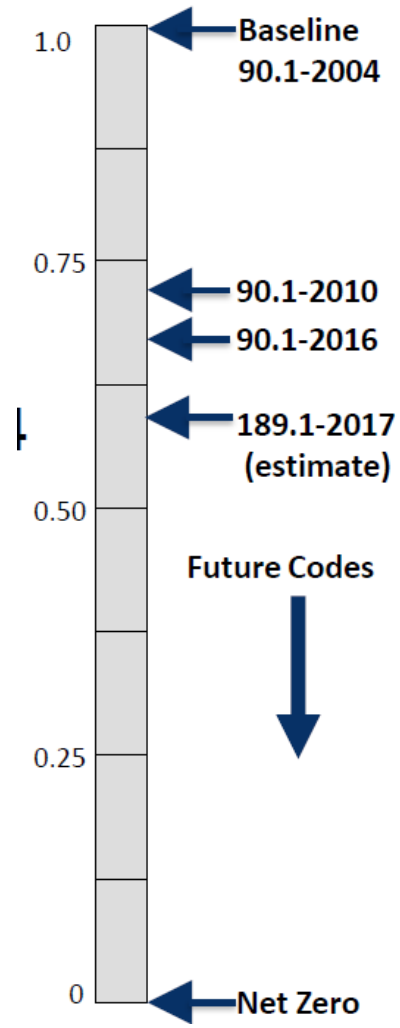
VERMONT
DEPARTMENT OF PUBLIC SERVICE

New Compliance Path

- 90.1-2016 Introduces a Third Path for Compliance
- Appendix G requires a Performance Cost Index (PCI) specific to building type and climate zone

$$Performance\ Cost\ Index\ (PCI) = \frac{Proposed\ Building\ Performance}{Baseline\ Building\ Performance}$$

- Stable and independent baseline set ~ 90.1-2004
- Intent is that the stringency of the baseline doesn't change (stable)
- Clear rules about what systems and other prescriptive choices are in baseline (independent)
- PCI target changes with each version of a code
- Each code edition has a required PCI for compliance
- Beyond code programs can choose a PCI to meet their needs
  - Vermont will base PCI on building modeling of the prescriptive CBES compliance path



Source: Pacific Northwest National Laboratory

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Performance Cost Index

- PCI shall be fuel neutral
  - PCI = BPF * (BBUEC + BBREC)/BBP, where
    - BPF = Building Performance Factor
    - BBUEC = Baseline Building Unregulated Energy Cost
    - BBREC = Baseline Building Regulated Energy Cost
    - BBP = Baseline Building Performance

Building Area Type	Proposed Code BPF
Multifamily	0.62
Healthcare/hospital	0.46
Hotel/motel	0.48
Office	0.43
Restaurant	0.50
Retail	0.44
School	0.39
Warehouse	0.53
All Others	0.45

VERMONT
DEPARTMENT OF PUBLIC SERVICE

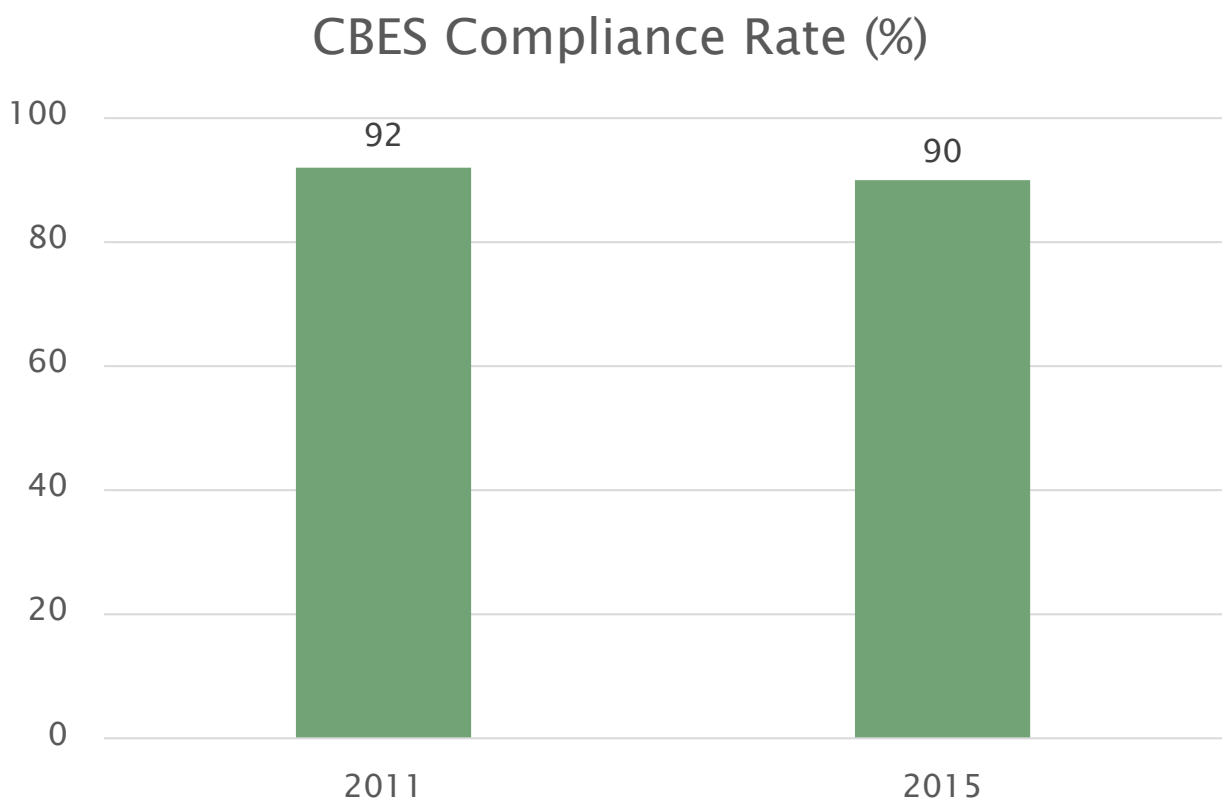
Code Compliance Studies

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Market Baseline Studies

2012 Study: "Vermont Energy Code Compliance Plan – Achieving 90% Compliance by 2017"

Respondents reported that 66% of projects undertaken exceed the minimum CBES requirement



VERMONT
DEPARTMENT OF PUBLIC SERVICE

Compliance Approach

	2020 Approach	Required Documents
	2020 CBES Prescriptive	CBES Certificate and COMcheck
	ASHRAE 90.1 – 2016 Sections 5-10 with Amendments	CBES Certificate and COMcheck
	ASHRAE 90.1 – 2016 Section 11 – Energy Cost Budget Method	CBES Certificate and all documentation as noted in Section 11.1.5 of ASHRAE 90.1-2016
	ASHRAE 90.1 – 2016 Appendix G – Performance Rating Method	CBES Certificate and all documentation as noted in Appendix G of ASHRAE 90.1-2016
	Above-Code Program Prescriptive	Contact Vermont DPS for approval of above-code program

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Survey Response

- Would you support stricter code compliance?
  - All respondents said: **Yes**
- If yes, how would you suggest getting more code compliance
  - All respondents said: **on-site inspections by a code official**
- Comments:
  - We need code officials who are knowledgeable and assistive in explaining the code, making formal interpretations for unusual cases, and visiting job sites to confirm construction complies with critical design elements – exactly as is done for other issues of public welfare.
  - The state can have an energy evaluator that has space in the fire marshals' offices and reviews plans. A separate form and fee would be required. I think one or two people could cover the entire state from a review standpoint.
  - Compliance starts with contractor registration.

VERMONT
DEPARTMENT OF PUBLIC SERVICE

Compliance Questions

- If compliance is important, then how do you think we should do it?
- Would a builder Registry be effective?
- What are our options besides the builder Registry?
- Could builder certification be effective?
- What ideas besides code officials?
- Are you for or against builder licensure?

VERMONT
DEPARTMENT OF PUBLIC SERVICE