

# What's Next?

USGBC MA

Building Tech Forum

Presented by Brent Ehrlich

# What's Next?

## BuildingGreen's Top Green Products for 2019 and Beyond



# Business as Usual: Difficult to integrate renewable energy and EV charging



Photo: By F5ZV at French Wikipedia - [CC BY-SA 3.0](#),

- Charging your electric vehicle (EV) at home using renewable energy typically requires two systems:
- an inverter to convert direct current (DC) to alternating current (AC) and...



# Business as Usual: Difficult to integrate renewable energy and EV charging

....a charger that typically supplies energy pulled from the grid.



*Photo: By Mariordo Mario Roberto Duran Ortiz - Own work,  
[CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)*



# What's Next? SolarEdge EV Charging Single Phase Inverter



Uses the company's Single Phase Inverter with HD-Wave, (high-definition wave) technology:

- 1/2 the size of standard inverters
- < 30 pounds
- Efficiencies up to 99%

*Photo: SolarEdge Technologies*



# SolarEdge EV Charging Single Phase Inverter

And adds:

- 240V level 2 charging system
- 7.6 kW (at 32 amp) of power from the grid (when necessary)
- 9.6 kW (at 40 amp) directly from PV system when the sun is shining
- Optimizes charging efficiency using renewable energy



*Photo: SolarEdge Technologies*



# SolarEdge EV Charging Single Phase Inverter

- Charges 6x faster than standard EV system
- Can be installed EV-ready as inverter only
- All-in-one system saves \$ on installation for connections, cable, ducting, wiring, and labor.
- Fully programmable
- Tracks charging data, energy production, and use
- Demand response ready



# Business as Usual: Polystyrene insulation below grade

Extruded polystyrene's (XPS) and expanded polystyrene (EPS)

High R-values + water resistance = default insulation for below grade

BUT

- XPS and EPS use problematic petroleum-based styrene chemistry
- are inherently flammable
- and XPS uses high-global-warming-potential (GWP) blowing agents



Photo: Jordon Dentz, The Levy Partnership





# What's Next? Foam Glass Aggregates



- Available from AeroAggregates and Glavel
- Made from recycled bottles and foaming agents
- Replaces insulation and aggregate below grade
- Can be used for green roofs and as lightweight aggregate

*Photo: AeroAggregate*



# Foam Glass Aggregates



*Photo: AeroAggregate*

- R-value of about 1.7 per inch
- Excellent compressive strength
- Non-combustible
- Water drains through
- Capillary break
- Resists pests and most chemicals
- Low-toxicity and considered “clean fill”
- Resists freeze/thaw cycles
- Extremely durable



# Business as Usual: Vinyl resilient flooring



*Photo: Decorative Concrete King. License: CC BY 2.0.*

Vinyl flooring is made from PVC:

- Is 57% chlorine
- Can contain phthalate plasticizers and heavy metals
- Is rarely recycled

PVC-free options:

- Are typically expensive
- May not perform as well
- Are rarely recycled



# What's Next? Shaw PET Resilient Flooring

- 97% PET (40% post-consumer recycled)
- No plasticizers
- PET fibers are entangled, heated, and pressed into a panel for greater strength and performance
- Color and design are printed onto the flooring and coated with a durable wear layer



*Photo: Shaw Commercial*



# Shaw PET Resilient Flooring



*Photo: Clear Path Recycling*

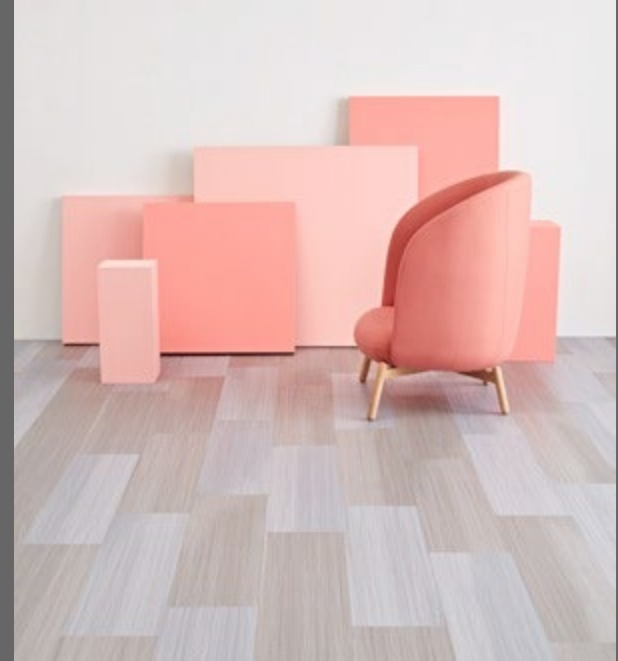
- 17 bottles per 1 ft<sup>2</sup> of PET Resilient
- 50% lighter than other flooring
- Excellent dimensional stability
- Scratch and dent resistant
- Breathable and moisture resistant
- Quiet
- Minimal maintenance
- Fully recyclable





# Shaw PET Resilient Flooring

- C2C Bronze (Gold for Material Reutilization)
- 12" x 48" planks
- Available from Shaw Contract and Patcraft Commercial



*Photo: Shaw Commercial*



# Business as Usual: High global warming potential concrete



*Photo: Michael Lavoie*

Portland cement production is responsible for approximately 5% of total global CO<sub>2</sub> emissions

1 ton of portland cement =  
1 ton of CO<sub>2</sub>

Fly ash and blast furnace slag have their own environmental and health concerns



# What's Next? Urban Mining Northeast

## Pozzotive Ground Glass Pozzolan

- Alternative to fly ash and slag
- Made from regional post-consumer recycled bottle glass
- Inert, amorphous silicate powder
- Replaces up to 40% of portland cement
- Used in millions of concrete masonry units (CMUs)
- Now available for ready-mix applications



*Photo: Urban Mining Northeast*





# Urban Mining Northeast Pozzotive Ground Glass Pozzolan



*Photo: Urban Mining Northeast*

- Creates a strong, dense, and durable concrete with lower permeability
- Requires less water and admixtures
- Improved workability



# Urban Mining Northeast Pozzotive Ground Glass Pozzolan

- Recycles some of the millions of tons of glass that might otherwise be landfilled
- Has a LEED compliant HPD v2.0
- ASTM standard expected in late 2018/early 2019



*Photo: Urban Mining Northeast*



# Business as Usual: High global warming potential refrigerant leaks



*Photo: Rapid Recovery*

Most commercial HVAC refrigerants have global warming potentials (GWP) thousands of times higher than CO<sub>2</sub>

Refrigerant leaks:

- release these high GWP gases directly into the atmosphere
- compromise the efficiency of the HVAC system,
- and can pose a safety hazard at high enough concentrations.



# Business as Usual: High global warming potential refrigerant leaks

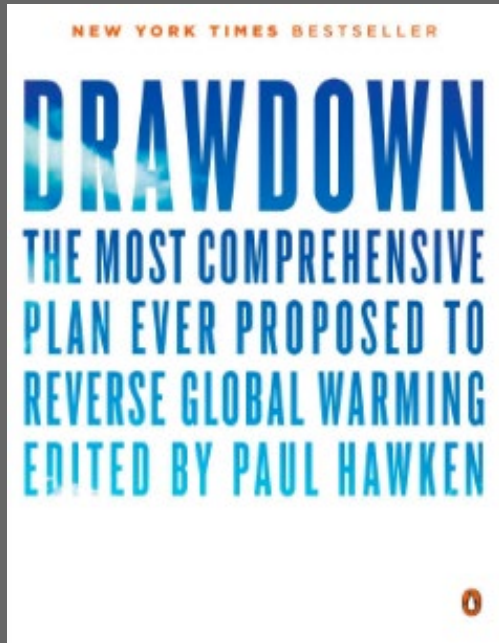


Photo: [drawdown.org](http://drawdown.org)

## Top Five Solutions for Arresting and Reversing Global Warming\*

1. Refrigerant management
2. Wind turbines
3. Reduce food waste
4. Plant-rich diet (avoid meat)
5. Tropical forest (avoid deforestation/reforest)

\*Based on “the total amount of green house gases they can potentially avoid or remove from the atmosphere.” *Drawdown*



# What's Next? MSA Safety Chillgard 5000 Refrigerant Leak Monitor

- Photoacoustic infrared (PAIR) technology detects leaks down to 1 part per million (ppm).
- Up to six refrigerants can be screened at a time, with 20 more available depending on end use.
- Modular, “plug-and-play” design
- Easy to maintain and upgrade



*Photo: MSA Safety*



# MS Safety Chillgard 5000 Refrigerant Leak Monitor



- Visual warnings and horns alert maintenance crews to leaks
- Can also shut down valves, turn on fans, or take other actions.
- Touchscreen dashboard
- Diagnostic programs aid in troubleshooting
- Prevents leaks by notifying staff when it's time for system maintenance
- It can also be integrated into building automation systems

Photo: MSA Safety



# BuildingGreen

- Founded in 1985
- In Brattleboro, Vermont
- Launched EBN in 1992
- 14 employees
- Supported by online memberships and consulting
- Not supported by product manufacturers



*BuildingGreen offices in the old Estey Organ Factory, Brattleboro*



Questions?

