

3 ways food retailers will be affected by new commercial refrigeration standards —

and how they can prepare.

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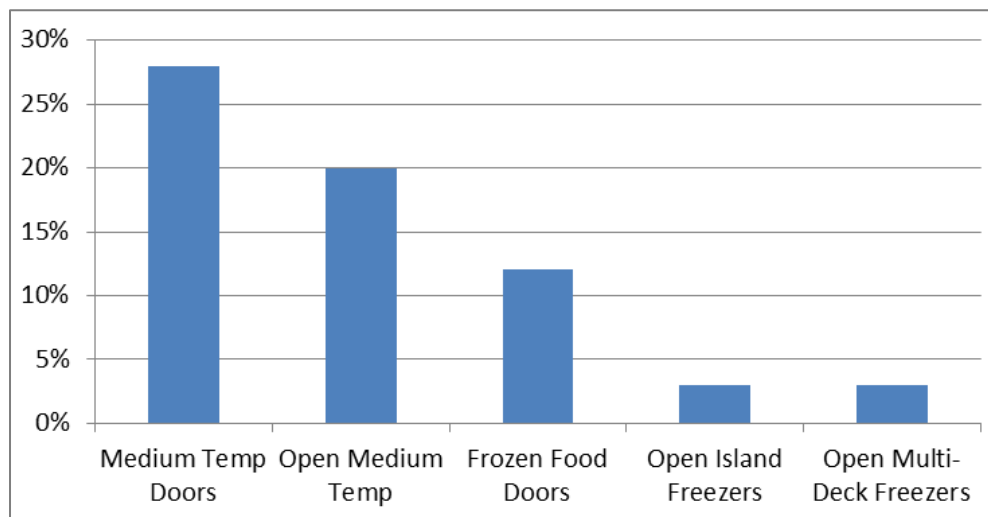
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Overview

Several years ago, the U.S. Department of Energy announced it would require greater energy efficiency for commercial refrigerated cases. The regulations went through comments, appeals and testing, but there was never any doubt: One day the way food retailers' refrigerated cases operate would change. On March 27, 2017, that day arrives.

The upcoming energy limits on commercial refrigeration cases, dubbed [DOE 2017](#), apply to most models, but the biggest changes are happening with closed cases. Paradoxically, that's because closed cases are already the industry's most energy-efficient models. There was less room for improvement, so reducing energy consumption required the greatest feats of engineering. Manufacturers tackled the problem in many ways, but most used some combination of energy-saving lights, more efficient motors and updated coils.

DOE 2017: Energy savings required by case model



Source: Hillphoenix

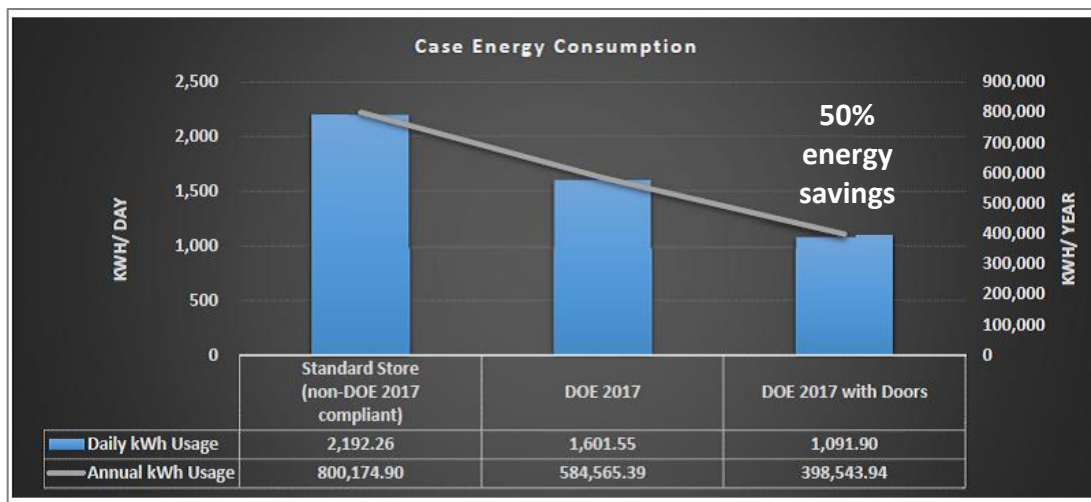
Effects on food retailers

The DOE 2017 regulations apply exclusively to commercial refrigeration manufacturers. But they are likely to have a significant impact on food retailers in three key ways:

1. **Many case models will change — and some will disappear.** Some of the refrigerated case models retailers have bought for years may no longer be available. The new regulations mean manufacturers will have to sunset a number of model lines. Food retailers will need to know how the equipment is changing and how to manage operating old and new cases in the same store environment.
2. **New cases will operate differently.** That could mean that the lighting looks different — and probably better — from what food retailers see in existing cases. It could mean the cases are quieter and the aisles are more comfortable for shoppers. It should lower store electricity bills. But it also will require an understanding of what's changing and how a food retailer and its employees need to prepare.
3. **New cases will affect store humidity and temperature.** DOE-required changes to refrigerated cases also could mean that food retailers will have to make operational changes of their own — in particular, heating and air conditioning — to ensure comfortable, safe, visually appealing store environments for shoppers.

The good news is that DOE 2017-compliant refrigerated cases will bring some of the energy-saving benefits the Department of Energy envisioned. In fact, a 70,000-square-foot supermarket can cut its annual kilowatt usage 50% by switching to DOE 2017-compliant cases with doors. (See charts below.) But to maximize these benefits and minimize potential challenges, food retailers need to begin preparing now for what's ahead.

Energy use comparison: Standard vs. DOE 2017-compliant cases by Hillphoenix



Notes: Calculations based on a 70,000-square-foot supermarket; Hillphoenix cases in this analysis exceed DOE 2017 requirements; this analysis includes adding doors to packaged produce, meat and beverage cases.

Annual energy costs savings for DOE 2017-compliant vs. non-compliant store



Notes:
Calculations based on a 70,000-square-foot supermarket; Hillphoenix cases in this analysis exceed DOE 2017 requirements; this analysis includes adding doors to packaged produce, meat and beverage cases.

What to expect when DOE 2017 takes effect

Food retailers don't have to comply with DOE 2017, but they will feel its effects. Some of the case models that have been sold for years will no longer be available because they won't meet the federal Department of Energy's new, stricter standards for energy efficiency. This does not mean existing cases in a store will disappear overnight — those models are grandfathered in. Nonetheless, stores will face changes — now or in the not-too-distant future — so they need to ensure their suppliers can help them through the transition. Here are three certainties, and related considerations for food retailers:

Many case models will change — and some will disappear

Make sure all new cases comply with DOE 2017. Before you order a new case, ask if it is DOE 2017 compliant. If it's not, don't buy it. While any penalty for producing a non-compliant case would hit the manufacturer, not the food retailer that purchases it, a food retailer could be left in a pinch if the manufacturer is slapped with a cease-and-desist order, and the case never gets made at all.

Ask your manufacturer how pre-DOE 2017 cases will be serviced. Find out whether you'll be able to fix a case that's not operating properly or replace a worn-out part. Will the manufacturer be able to send a technician or train your own technicians to deal with any issues? Make sure your manufacturer fully explains repairs and retrofits under DOE 2017.

New cases will operate differently

Ask how old and new cases will work together. Many stores will transition to DOE 2017 a few cases at a time — buying new equipment only as necessary to replace old cases. Engage your technicians and engineers in a conversation with your manufacturer. Ask the supplier how operating new and old cases together will work. Will you need to run them on different controllers to accommodate the differences in control set points? Will your mix of old and new cases affect HVAC performance? Make sure your manufacturer can help you come up with a plan for optimizing case performance and the store environment.

Understand what's changing. Manufacturers took different paths to get to DOE 2017 compliance. Ask your supplier how they achieved compliance — and what that will mean for case performance and maintenance. Again, this is a conversation that should be open to your own technicians and engineers. Will you need to train your technical or store staff to maintain the new cases in a different way? Are shoppers likely to notice the changes? Is there any flexibility in configurations? For example, if a new model has a row of five lights, and you prefer only three lights, can the manufacturer make that adjustment for you?

Engineering a path to DOE 2017

Here are some of the ways Hillphoenix engineers met DOE 2017's requirement to reduce energy consumption of medium-temperature door cases by a whopping 28%:

- Upgrading to LED lights
- Repositioning anti-sweat heaters
- Increasing coil efficiency
- Improving fan motor efficiency
- Adding occupancy sensors to operate lights

New cases will affect store humidity and temperature

Understand how heating and air-conditioning demands will shift. Food retailers historically have relied on the extra cold air emanating from refrigerated cases to help cool stores. The new, more energy-efficient DOE 2017-compliant cases will have less cold air spill, so stores will need to change the output of their heating and air-conditioning (HVAC) systems to meet [ASHRAE 72-2005](#), an industry standard set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers. This standard aligns with the operational settings of DOE 2017-compliant cases; as long as they are in sync, the store environment and the case performance should be optimized to:

- Ensure customer comfort
- Extend product integrity and longevity
- Reduce liability from condensation
- Minimize case door fogging
- Optimize energy efficiency

In some situations, particularly in newer stores, store managers will simply need to know what's coming and adjust thermostat levels to ASHRAE standards. In other stores, the existing HVAC system will not be adequate, and stores may need to modernize HVAC systems.

How to prepare for DOE 2017

The first thing food retailers should do to get ready for DOE 2017 is to engage the key store staff and engineers who maintain refrigeration equipment day in and day out. These internal resources will be essential to making smart, strategic decisions about how to select new equipment and adjust store environments.

Second, bring suppliers into the conversation. Refrigeration manufacturers have been moving toward the DOE 2017 standards for several years. They are your subject-matter experts and should be prepared to help you make the necessary transitions to get the greatest benefits from more energy-efficient cases. Use the “What to expect” section above to guide conversations with suppliers, and ask if they offer training that can help you and your employees navigate the changes smoothly. Remember, suppliers know what has worked — and what hasn’t — for other food retailers. Tap into their experience from the field.

Third, start now. Even if you aren’t planning to purchase DOE 2017-compliant cases immediately, you’ll confront these industry changes before long. And now is the time to do the return-on-investment calculations on energy savings vs. new case costs. Ask your supplier what kinds of incentives and rebates may be available to your store. (See chart.) With the extraordinary energy savings embedded in DOE 2017-compliant cases, you may save more money by acting fast.

Potential incentives and rebates for purchasing DOE 2017-compliant refrigerated cases

	EC Motors •\$20 per motor •Most utilities are not offering this incentive after 2017
	Anti-Sweat Controls •\$20/ door controlled
	Low/No Heat doors (low temp cases) •\$50/ door controlled
	LED lighting Controls •\$5/ Light Controlled •\$10/door for door cases
	LED case lighting •\$10-40/ light •Utilities are moving away from offering this incentive for new cases
	Doors on Open Medium Temperature Cases •\$75/ door
	Night Curtains •\$5/ linear foot of case

Changes in energy use by refrigerated case model

DOE 2017 energy limits on commercial refrigeration cases apply to most models, but the biggest changes are happening with closed cases. That's because closed cases are already the industry's most energy-efficient models, so reducing energy consumption required the greatest feats of engineering.

Key	M = Med Temp L = Low Temp I = Ice Cream	RC = Remote SC = Self-Contained	TDA = Display Area V = Volume	
				2017 vs 2012 Energy Limits
Case Structure	Equipment Class	2017 Energy Limits	2012 Energy Limits	
Vertical Open	VOP.RC.M	0.64 x TDA + 4.07	0.82 x TDA + 4.07	← -20%
	VOP.RC.L	2.2 x TDA + 6.85	2.27 x TDA + 6.85	
	VOP.RC.I	2.79 x TDA + 8.7	2.89 x TDA + 8.7	
	VOP.SC.M	1.69 x TDA + 4.72	1.74 x TDA + 4.72	← -3%
	VOP.SC.L	4.25 x TDA + 11.82	4.37 x TDA + 11.82	
Semi-Vertical Open	SVO.RC.M	0.66 x TDA + 3.18	0.83 x TDA + 3.18	← -18%
	SVO.RC.L	2.2 x TDA + 6.85	2.27 x TDA + 6.85	
	SVO.RC.I	2.79 x TDA + 8.7	2.89 x TDA + 8.7	
	SVO.SC.M	1.7 x TDA + 4.59	1.73 x TDA + 4.59	
	SVO.SC.L	4.26 x TDA + 11.51	4.34 x TDA + 11.51	
Horizontal Open	HZO.RC.M	0.35 x TDA + 2.88	0.35 x TDA + 2.88	
	HZO.RC.L	0.55 x TDA + 6.88	0.57 x TDA + 6.88	← -3%
	HZO.RC.I	0.7 x TDA + 8.74	0.72 x TDA + 8.74	
	HZO.SC.M	0.72 x TDA + 5.55	0.77 x TDA + 5.55	
	HZO.SC.L	1.9 x TDA + 7.08	1.92 x TDA + 7.08	
Service Over Counter	SOC.RC.M	0.44 x TDA + 0.11	0.51 x TDA + 0.11	
	SOC.RC.L	0.93 x TDA + 0.22	1.08 x TDA + 0.22	
	SOC.RC.I	1.09 x TDA + 0.26	1.26 x TDA + 0.26	
	SOC.SC.M	0.52 x TDA + 1	0.60 x TDA + 1.00	
	SOC.SC.L	1.1 x TDA + 2.1	0.75 x V + 4.10	
	SOC.SC.I	1.53 x TDA + 0.36	1.76 x TDA + 0.36	

Energy Reduction Manageable, BUT Closed Cases More Difficult

		2017	Vs	2012	
Vertical Closed Transparent	VCT.RC.M	0.15 x TDA + 1.95		0.22 x TDA + 1.95	← -28%
	VCT.RC.L	0.49 x TDA + 2.61		0.56 x TDA + 2.61	← -12%
	VCT.RC.I	0.58 x TDA + 3.05		0.66 x TDA + 3.05	
	VCT.SC.M	0.10 x V + 0.86		0.12 x V + 3.34	← -47%
	VCT.SC.L	0.29 x V + 2.95		0.75 x V + 4.10	← -60%
	VCT.SC.I	0.62 x TDA + 3.29		0.67 x TDA + 3.29	
Horizontal Closed Transparent	HCT.RC.M	0.16 x TDA + 0.13		0.16 x TDA + 0.13	
	HCT.RC.L	0.34 x TDA + 0.26		0.34 x TDA + 0.26	
	HCT.RC.I	0.40 x TDA + 0.31		0.40 x TDA + 0.31	
	HCT.SC.M	0.06 x V + 0.37		0.12 x V + 3.34	← Greater than 80% Reduction
	HCT.SC.L	0.08 x V + 1.23		0.75 x V + 4.10	
	HCT.SC.I	0.56 x TDA + 0.43		0.56 x TDA + 0.43	
Vertical Closed Solid	VCS.RC.M	0.10 x V + 0.26		0.11 x V + 0.26	
	VCS.RC.L	0.21 x V + 0.54		0.23 x V + 0.54	
	VCS.RC.I	0.25 x V + 0.63		0.27 x V + 0.63	
	VCS.SC.M	0.05 x V + 1.36		0.10 x V + 2.04	
	VCS.SC.L	0.22 x V + 1.38		0.40 x V + 1.38	
	VCS.SC.I	0.34 x V + 0.88		0.38 x V + 0.88	
Horizontal Closed Solid	HCS.RC.M	0.10 x V + 0.26		0.11 x V + 0.26	
	HCS.RC.L	0.21 x V + 0.54		0.23 x V + 0.54	
	HCS.RC.I	0.25 x V + 0.63		0.27 x V + 0.63	
	HCS.SC.M	0.05 x V + 0.91		0.10 x V + 2.04	
	HCS.SC.L	0.06 x V + 1.12		0.40 x V + 1.38	
	HCS.SC.I	0.34 x V + 0.88		0.38 x V + 0.88	
Pull Down	PD.SC.M	0.11 x V + 0.81		NA	

Big Reductions on Closed Cases

Vertical Med Temp Remote
Vertical Self-Contained
Horizontal Self-Contained

Conclusion

DOE 2017 regulations for commercial refrigeration take effect March 27, 2017. The changes apply to manufacturers, but they will have a significant impact on food retailers. Many refrigerated case models will change, and some will no longer be available. DOE 2017-compliant cases will operate differently. And new cases will affect store environments; food retailers may need to adjust HVAC systems or replace them. The upside will be extraordinary energy savings for food retailers that switch to DOE 2017-compliant cases. But to maximize benefits and minimize potential operational disruptions, food retailers need to start preparing now for what's ahead.

About Hillphoenix

Hill PHOENIX Inc., a Dover Company, is based in Conyers, Georgia. The company designs and manufactures commercial refrigerated display cases and specialty products along with commercial and industrial refrigeration systems and integrated power distribution systems. Training, design, energy and aftermarket services are available through the Hillphoenix Learning and Design Centers and The AMS Group. Our mission is to provide fresh, innovative solutions that help our customers stay relevant and competitively differentiated. Our vision inspires us to deliver creative, flexible and responsible innovations in food retail refrigeration. Visit www.hillphoenix.com or call 800-283-1109 for more information.