



INTRODUCTION TO THE DEPARTMENT OF ENERGY (DOE) 2023 REGULATORY REQUIREMENTS

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As part of the DOE's initiative to reduce the overall consumption of energy within the United States, the DOE new minimum efficiency standards for commercial packaged air conditioners and heat pumps will go into effect on January 1, 2023.

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The LG Rooftop DOAS cabinets 12 & 22 set to exceed DOE 2023 minimum IEER requirements.	Related government website links.

As we get ready for the DOE's 2023 regulatory requirements, we'd like to prepare you for the upcoming changes.

DEAR LG ASSOCIATES:

As part of the Department of Energy's (DOE) initiative to reduce overall energy consumption within the United States, the DOE's new minimum efficiency standards for commercial packaged air conditioners and heat pumps will go into effect on January 1, 2023. The changes to these regulations will present new challenges; however, as part of our commitment to stay Ahead of the Expected, LG Electronics U.S.A., Inc.'s Air Conditioning Technologies is prepared to meet these challenges and support you through this transition.

A new testing procedure for higher efficiency ratings and compliance will be required. LG Electronics U.S.A., Inc.'s Air Conditioning Technologies is dedicated to complying with this standard and has created this document to help prepare you for these upcoming changes. In addition, this document includes information that will guide you when addressing minimum efficiency changes, regulatory-ready product updates, and new technologies.

As your solution expert, we strive to make such resources available to you leading to this effective change. Please be sure to visit LG's site for the most up-to-date resources.

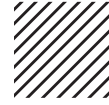


OVERVIEW

The DOE analyzes the effects of energy usage every six years. A direct result of such analysis is the setting, and subsequent re-setting, of the minimum efficiency requirements and managing the testing standards by which these efficiencies are measured. In 2018, the DOE began the first phase of a six-year plan by requiring a 13% increase in energy efficiency for commercial packaged air conditioners, heat pumps, and split systems. The second phase will begin in 2023.

COMMERCIAL MINIMUM EFFICIENCY CHANGE: INTEGRATED ENERGY EFFICIENCY RATIO (IEER), COEFFICIENT OF PERFORMANCE (COP)

Beginning on January 1, 2023, commercial air conditioning and heat pump equipment from 65,000 btu/h to 76,000 btu/h must be manufactured to achieve an increase of 15% in energy efficiency, when compared to the ratings set forth in 2018. This increase, along with the HVAC related energy efficiency requirements implemented in 2018, will result in a 30% increase in energy efficiency overall. In addition, all gas-fired commercial air conditioners will be required to meet an 81% gas efficiency rating. At this time, there are no known further changes to the testing procedures mandated for commercial air conditioners, and heat pumps greater than 65,000 btu/h.



2023

START OF SECOND PHASE



30%

INCREASE IN ENERGY
EFFICIENCY OVERALL



Due to the stringent testing requirements, there will be new nomenclature and metrics.

SINGLE PHASE RESIDENTIAL & LIGHT COMMERCIAL SEER2, EER2, AND HSPF2

Minimum efficiencies for single-phase air conditioners and heat pumps, 5 tons or less, have also been analyzed and adjusted by the DOE. As of January 1, 2023, these single-phase residential and light commercial products must comply with new efficiency rating testing procedure, which include increases to external static pressure during testing. The new testing procedures, which will better reflect field conditions, have resulted in additional classifications and metrics – SEER2, EER2, and HSPF2. The new energy efficiency requirements and ratings apply to all residential and 3 to 5-ton light commercial, single-phase equipment manufactured on or after January 1, 2023.

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EER	▶	EER2
HSPF	▶	HSPF2
SEER	▶	SEER2

MANUFACTURER AND DOE COMPLIANCE

After January 1, 2023, LG will no longer manufacture any units that are not in compliance with the new DOE energy efficiency mandates. Referring to 10CFR part 431.97, compliance is set only on the manufacturing date, which indicates that any three-phase product produced on December 31, 2022, or earlier can still be sold after the compliance date.

COMMERCIAL ROOFTOP UNIT RATING COMPARISONS FOR COMMERCIAL PACKAGED AIR CONDITIONER AND HEAT PUMPS

As previously mentioned, the new DOE 2023 minimum efficiency standards for packaged air commercial air conditioners and heat pumps will increase the minimum efficiency by 15%, **increasing the total efficiency of these systems up by 30% from 2015.**



10CFR PART 431.97

<https://www.ecfr.gov/current/title-10/chapter-III/subchapter-D/part-431/subpart-F/subject-group-ECFR2640f6ad978e4e6/section-431.97>

SPECIFIC CHANGES: COMMERCIAL EQUIPMENT > 65,000 BTUH

For commercial unitary equipment greater than 65,000 BTUH, the 2023 DOE minimum efficiency requirements target the IEER (Integrated Energy Efficiency Ratio) of the product. Although the metrics surrounding the IEER itself will not change on January 1, 2023, the minimum IEER will increase by an average of 12-15%, depending on the capacity ranges identified below:

Packaged Air Conditioning Units | Air Cooled Direct Expansion

Equipment Type		Existing January 1, 2018	New January 1, 2023
65,000 btu/h ≤ Small Commercial Packaged AC's < 135,000 btu/h	Electric Resistance or No Heating	12.9 IEER	14.8 IEER
	All Other Types of Heating	12.7 IEER	14.6 IEER
135,000 btu/h ≤ Large Commercial Packaged AC's < 240,000 btu/h	Electric Resistance or No Heating	12.4 IEER	14.2 IEER
	All Other Types of Heating	12.2 IEER	14.0 IEER
240,000 ≤ Very Large Commercial Packaged AC's 760,000 btu/h	Electric Resistance or No Heating	11.6 IEER	13.2 IEER
	All Other Types of Heating	11.4 IEER	13.0 IEER

<https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-431/subpart-F/subject-group-ECFR2640f6ad978e4e6/section-431.97>

Packaged Air Conditioning Units | Air Cooled Heat Pumps

Equipment Type		Existing January 1, 2018	New January 1, 2023
65,000 btu/h ≤ Small Commercial Packaged AC's < 135,000 btu/h	Electric Resistance or No Heating	12.2 IEER, 3.3 COP	14.1 IEER, 3.4 COP
	All Other Types of Heating	12.0 IEER, 3.3 COP	13.9 IEER, 3.4 COP
135,000 btu/h ≤ Large Commercial Packaged AC's < 240,000 btu/h	Electric Resistance or No Heating	11.6 IEER, 3.2 COP	13.5 IEER, 3.3 COP
	All Other Types of Heating	11.4 IEER, 3.2 COP	13.3 IEER, 3.3 COP
240,000 ≤ Very Large Commercial Packaged AC's 760,000 btu/h	Electric Resistance or No Heating	10.6 IEER	NA

<https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-431/subpart-F/subject-group-ECFR2640f6ad978e4e6/section-431.97>

Split Air Conditioning Units | Air Cooled Heat Pumps

Equipment Type		Existing January 1, 2018	New January 1, 2023
65,000 btu/h ≤ Small Commercial Split AC's < 135,000 btu/h	Electric Resistance or No Heating	12.2 IEER, 3.3 COP	14.1 IEER, 3.4 COP
	All Other Types of Heating	12.0 IEER, 3.3 COP	13.9 IEER, 3.4 COP
135,000 btu/h ≤ Large Commercial Split AC's < 240,000 btu/h	Electric Resistance or No Heating	11.6 IEER, 3.2 COP	13.5 IEER, 3.3 COP
	All Other Types of Heating	11.4 IEER, 3.2 COP	13.3 IEER, 3.3 COP
240,000 ≤ Very Large Commercial Split AC's 760,000 btu/h	Electric Resistance or No Heating	10.6 IEER, 3.2 COP	12.5 IEER, 3.2 COP
	All Other Types of Heating	10.4 IEER, 3.2 COP	12.3 IEER, 3.2 COP

<https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-431/subpart-F/subject-group-ECFR2640f6ad978e4e6/section-431.97>

WHAT THIS MEANS FOR LG PACKAGED UNITS CONFIGURED FOR PARTIAL RECIRCULATION

The table below reflects the changes made to the LG Rooftop Dedicated Outdoor Air Systems (DOAS) cabinets 12 and 22 22 in anticipation of the DOE 2023 minimum IEER requirement changes:

LG Electronics 12 Chassis

Nominal Tonnage	DOE 2023 Minimum IEER	New Inverter Scroll
5	14.8	19.0
7	14.8	19.0
10	14.8	18.1
12.5	14.2	18.2
15	14.2	17.9

LG Electronics 22 Chassis

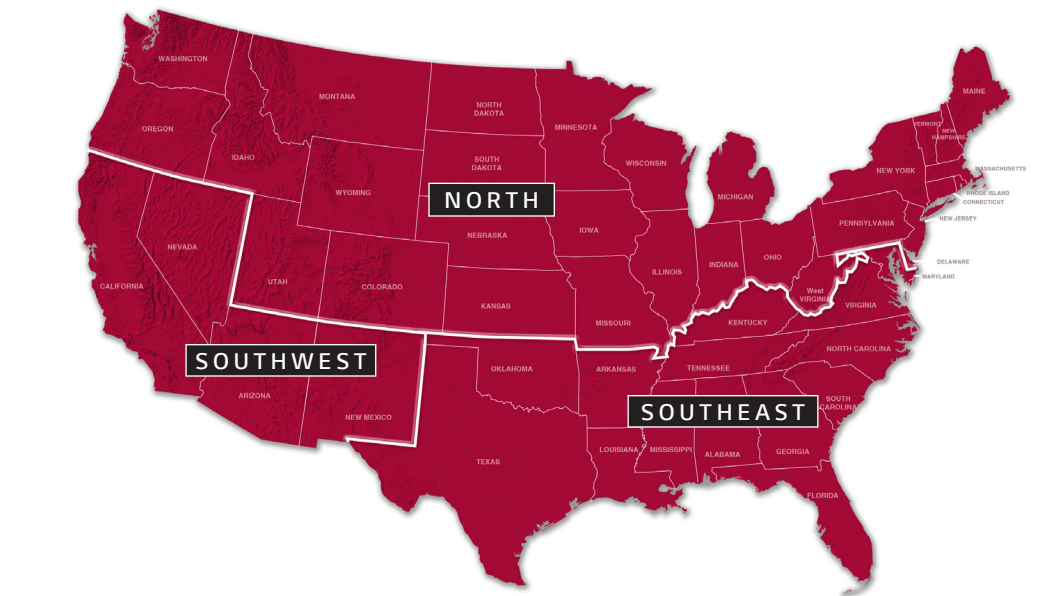
Nominal Tonnage	DOE 2023 Minimum IEER	Inverter Scroll Lead EC / All EC
15	14.0	19.8 / 20.7
17.5	14.0	20.1 / 21.4
20	13.0	16.5 / 17.2
25	13.0	17.1 / 18.0
30	13.0	16.2 / 16.6



WHAT THIS MEANS FOR INSTALLATION PER REGION **COMMERCIAL**

In general, the date of manufacture will guide distributors, dealers, and contractors as to whether they can sell/install a non-compliant product after January 1, 2023. For instance, if the product was manufactured on or before December 31, 2022, it may be installed after January 1, 2023 in all regions according to the new DOE standards.

Date of Production All Regions



RESIDENTIAL AND LIGHT COMMERCIAL SEER2, EER2, AND HSPF2

Regarding the new minimum energy efficiency ratings for 2023, a revised testing procedure will encapsulate the energy ratings for residential and 3 to 5-ton light commercial single-phase products. The new testing procedure will also account for more accurate field conditions. As a result of new field conditions (increased external static pressure from 0.3 to 0.5) being considered, new efficiency categories were developed. These new categories incorporate changes that, in practice, reduce the global efficiency metric when compared to the 2022 SEER/EER/HSPF ratings for each region. For instance, the new SEER2 testing and rating will raise HVAC equipment's testing conditions for external static pressure by a factor of 5. This hike will result in increased blower motor watt usage, which reduces energy efficiency ratings.



SEER(M)					SEER(M1)
	1992	2006	2015	2023	2023 SEER2
North	10	13	13	14	13.4
Southeast	10	13	14	15	14.3
Southwest	10	13	14	15	13.3

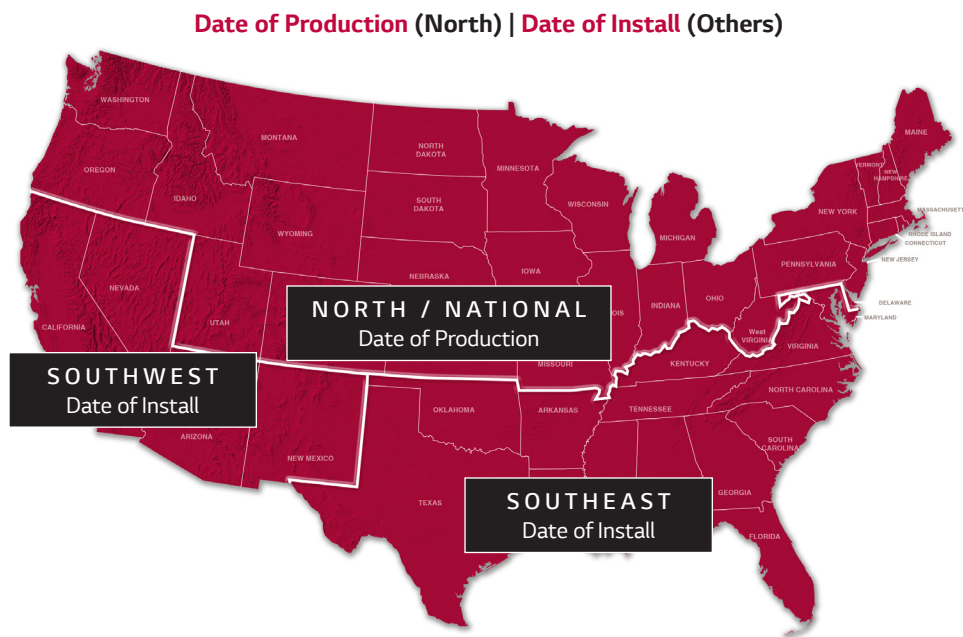
3 to 5 Tons Packaged Air Conditioning Units | Air Cooled DX and Heat Pumps

Equipment Type		Three Phase*	Single Phase
Small Commercial Packaged AC's < 65,000 btu/h	All Heat Types	14.0 SEER, 8.0 HSPF	13.4 SEER2, 6.7 HSPF2

*Three phase 3-5 ton models have the same efficiency as existing models today. There is no change for SEER or HSPF for three phase models, only single-phase is moving to SEER2 and HSPF2.

WHAT THIS MEAN FOR INSTALLATION PER REGION RESIDENTIAL

SEER2 regulatory requirements will be based on the region within the United States: North, Southwest, and Southeast.



North/National Region

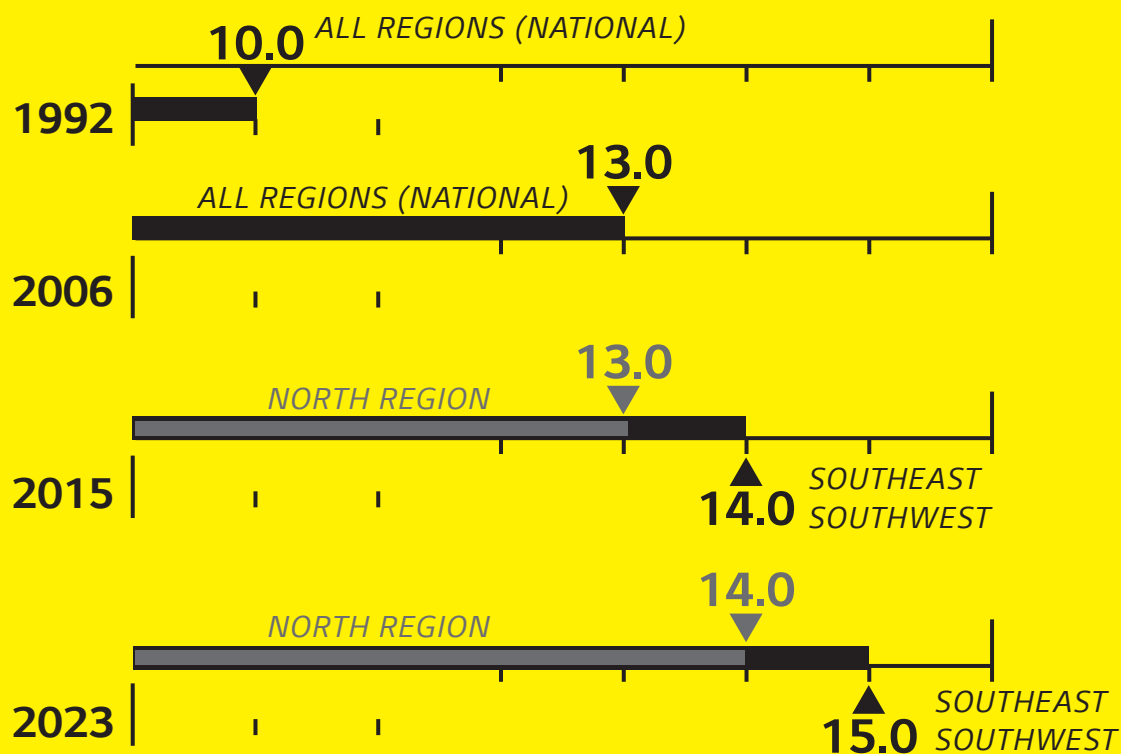
In general, the date of manufacture will guide installing distributors, dealers, and contractors as to whether they can sell/install a non-compliant product after January 1, 2023. **If the equipment was manufactured before this date, it may be installed after January 1, 2023 in the North/National region according to the new DOE standards.**

Southeast and Southwest Regions

Primarily, the installation date will guide all installation distributors, dealers, and contractors on whether they can sell/install a non-compliant product after January 1, 2023. **As of this date, all new sales/installs must comply with the new DOE standards for both the Southeast and Southwest Regions.**

SEER HISTORICAL REQUIREMENT

RESIDENTIAL SPLIT AIR CONDITIONERS



NEW MINIMUM EFFICIENCY REQUIREMENTS

The DOE has mandated new energy efficiency requirements for all newly manufactured residential and commercial air conditioners and heat pumps, which will take effect on January 1, 2023.

In addition, more stringent testing requirements will go into effect for all residential/light commercial 3 to 5-ton, single-phase equipment manufactured on or after January 1, 2023.



All Regions SEER2 Regulations

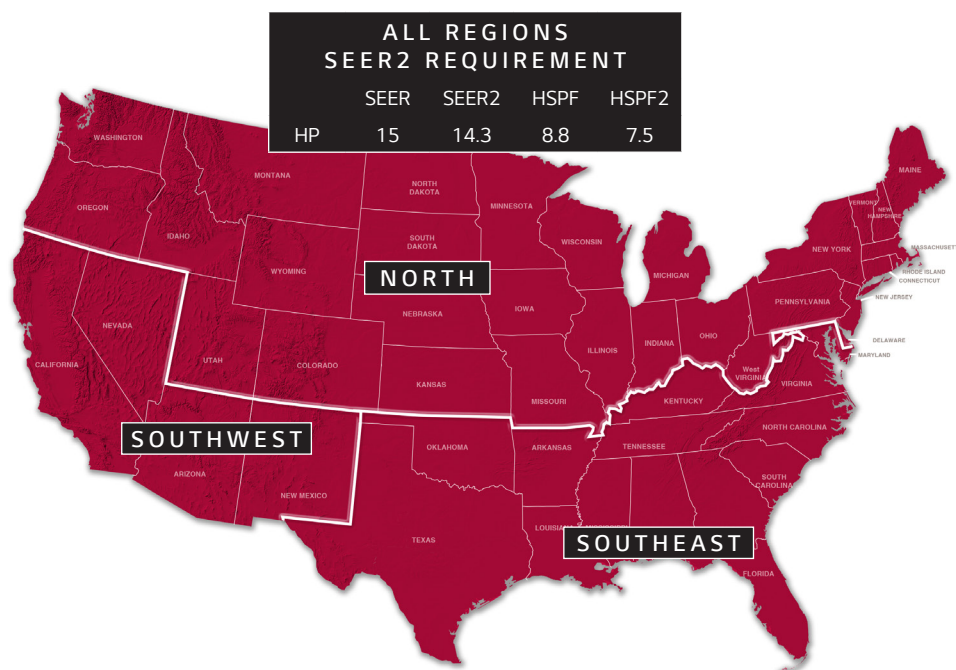
In all regions, the new SEER2 requirements will be a SEER2 rating of at least 14.3 for heat pumps and equipment's manufacturing date will determine its compliance.

North Regions SEER2 Regulations

Heat pumps and single-packaged units manufactured before January 1, 2023, may still be sold and installed in the North region. However, all units manufactured after this date must meet the new SEER2 requirement(s).

Southwest and Southeast Regions SEER2 Regulations

Any equipment that does not meet the new standards by January 1, 2023 cannot be sold or installed in this region regardless of the manufacturing date.



The DOE 2023 efficiency standards provide a 15% energy efficiency increase from the previous standard. Always Ahead of the Expected, many current LG HVAC products already meet or exceed these new minimum efficiency standards. LG Electronics U.S.A. will provide HVAC compliant products that meet, or exceed, the new standards.

Additional Resources:

- U.S. Department of Energy (Energy.gov)
- U.S. Environmental Protection Agency (EPA.gov)
- EPA and DOE Energy Efficiency (EnergyStar.gov)
- U.S. Government's National Archives (FederalRegister.gov)



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