Energy Efficiency and Low Global Warming Refrigerant Nexus

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California Energy Commission

Topics

▶ Overview of the Energy Commission

▶ Why are low GWP refrigerants important?

▶ Nexus between low-GWP refrigerants and energy efficiency

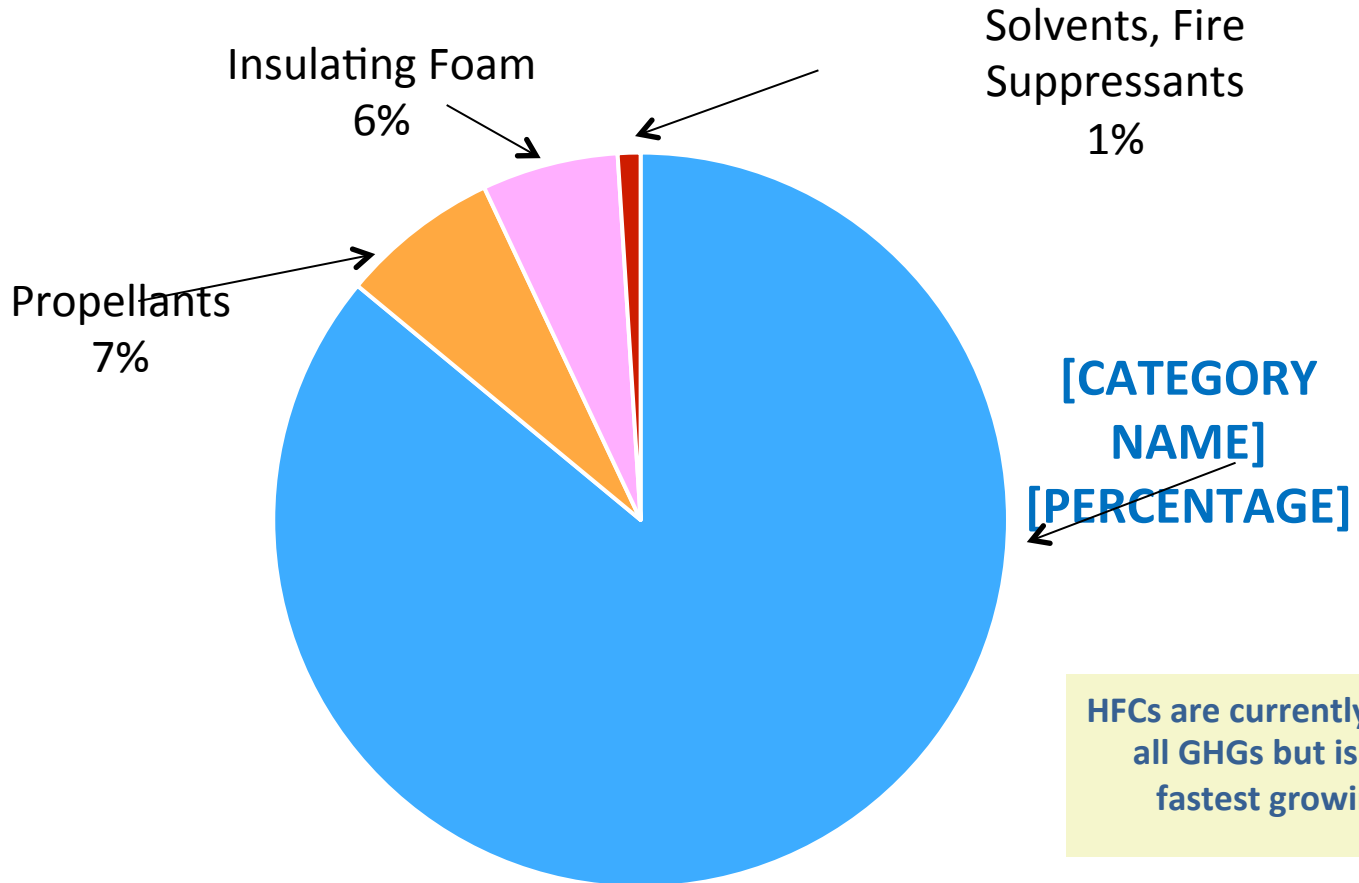▶ Examples of funded projects

About the California Energy Commission

- ▶ State's primary energy policy and planning agency

- ▶ Committed to reducing energy costs and environmental impacts of energy use – such as greenhouse gas emissions.

- ▶ Core responsibilities:

  - Advancing State Energy Policy

  - Achieving Energy Efficiency

  - Investing in Energy Innovation

  - Developing Renewable Energy

  - Transforming Transportation

  - Certifying Thermal Power Plants

  - Preparing for Energy Emergencies

Major Sources of Hydrofluorocarbons in California

Insulating Foam
6%

Solvents, Fire
Suppressants
1%

Propellants
7%

[CATEGORY NAME]
[PERCENTAGE]

HFCs are currently 4% of all GHGs but is the fastest growing

Source: California Air Resources Board

Energy Innovation Programs

▶ Electric Program Investment Charge (EPIC)

▶ Natural Gas Research and Development

▶ Food Production Investment Program

Electric Program Investment Charge

► Established by the California Public Utilities Commission in 2011 to address a critical gap in California's clean energy policy.

► Approximately $125 million/year

  ► Funded projects must benefit electricity ratepayers and lead to technology advancements, transforming our energy system and making the state's clean energy goals achievable.

  ► Example areas: energy efficiency, demand response, renewable energy, smart grid, storage, environmental, electric vehicle grid integration and market facilitation

Refrigerant projects are covered under energy efficiency

Current Alternative Refrigerant Research

The goal of the research is to increase energy efficiency <u>and</u> reduce GHG emissions

▶ **Electric Power Research Institute (EPRI)**:

 – **Commercial Buildings**: Develop climate appropriate HVAC systems to reduce energy use and demand, including test the performance and energy efficiency of a variety of low GWP refrigerants, such as propane, ammonia, and CO_2. (EPC-15-004)

 – **Residential Buildings**: Develop and test next generation space conditioning system - evaluate and test the performance and efficiency of R32 as an alternate refrigerant. (EPC-14-021).

 – **Food Processing**: Develop and test energy efficient ultra-low charge ammonia refrigeration system—potential to expand use in cold storage, commercial refrigeration, buildings, etc. (EPC-16-048)

▶ **Lawrence Berkeley National Laboratory**: Research focused on the benefits and challenges in deployment of low GWP A3 refrigerants in residential and commercial cooling equipment. (EPC-16-041)
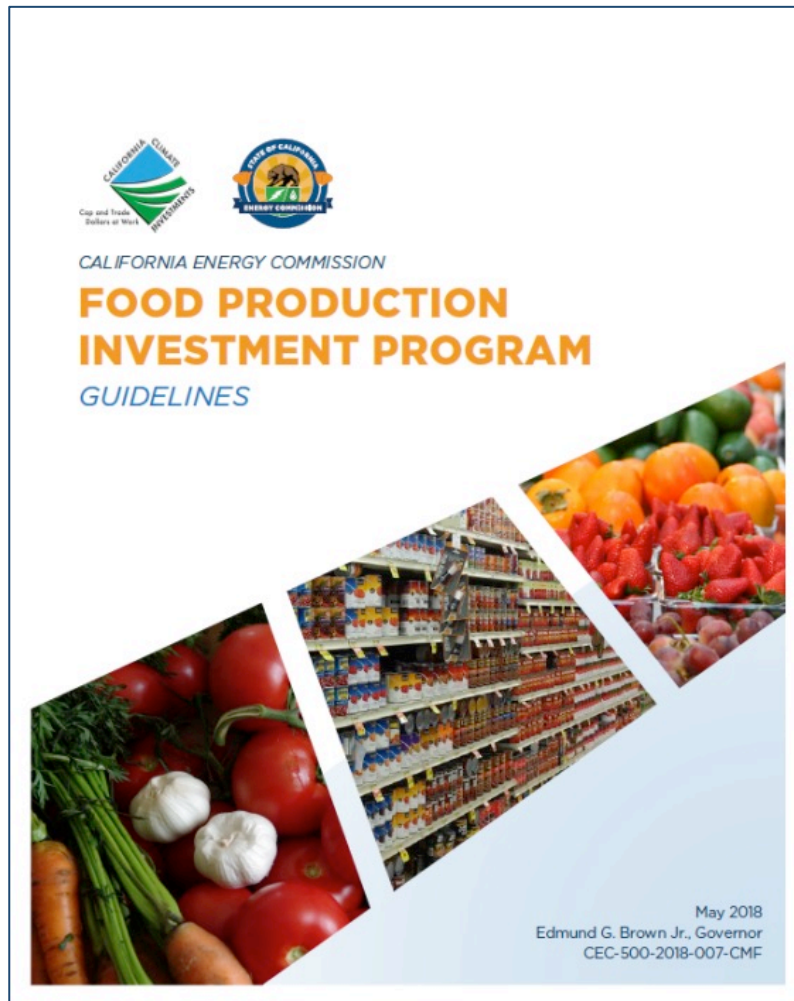
Initiative 1.7.1: Optimize Refrigeration Compressor Efficiency and Test and Evaluate Alternative Refrigerants

- Test and evaluate alternative refrigerants, such as propane, CO_2 and others for both small and large refrigeration units in commercial/industrial applications.

- Focus on refrigerants with low global warming potential and high energy efficiency potential for appropriate applications and locations.

Food Production Investment Program

CALIFORNIA ENERGY COMMISSION

FOOD PRODUCTION INVESTMENT PROGRAM

GUIDELINES

May 2018
Edmund G. Brown Jr., Governor
CEC-500-2018-007-CMF

► $60 million from the Greenhouse Gas Reduction Fund

► Grants for projects that **reduce GHG emissions through on-site reductions in electricity, natural gas and/or other fossil fuel use or through the use of low global warming refrigerants**

► Eligibility limited to food processors defined by the NAICS code 311 and 3121* (Food & Beverage Manufacturing)

► Additional information in guidelines: http://www.energy.ca.gov/research/fpip/documents/

More Information

- **EPIC**

  - Information: www.energy.ca.gov/research/epic/index.html

  - Solicitations: www.energy.ca.gov/contracts/epic.html

  - Energy Innovation Showcase: innovation.energy.ca.gov

  - Contact: Virginia Lew: Virginia.Lew@energy.ca.gov

- **Food Production Investment Program**

  - Information and to subscribe to the listserv: http://www.energy.ca.gov/research/fpip/index.html

  - Contact: Cyrus Ghandi: Cyrus.Ghandi@energy.ca.gov

- **Sign up for future solicitations and list serves, select "Opportunity"**: www.energy.ca.gov/listservers/