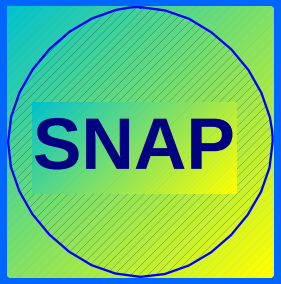
EPA's Significant New Alternatives Policy Program

How GreenChill Partners Can Lead in Refrigeration Innovations



Monica Shimamura
Margaret Sheppard

Dave Godwin
January 23, 2009

Agenda--SNAP Program

- Purpose of the SNAP Program
- Acceptable alternatives for retail food refrigeration
- Process for review of alternatives
- SNAP review of natural refrigerants
- Where to get additional information

SNAP =
Significant New Alternatives Policy

SNAP Background

- Part of the U.S. response to the Montreal Protocol
- Section 612 of the Clean Air Act directs EPA to evaluate and list substitutes for ODSs that reduce overall risk to human health and the environment
- Alternatives include both
  - Alternative refrigerants (e.g. R-404A) and
  - Alternative technologies (e.g. thermoelectric)

The SNAP Program is Unique!

Q: What's the purpose of SNAP?

A: Provides choices of substitutes for ozone-depleting substances while minimizing new environmental or health risks.

Q: Why is it unique?

A: Only program of its kind in the world.

Q: Why should the commercial refrigeration industry be interested in SNAP?

A1: Must use alternatives found acceptable (or meet certain exceptions for test marketing/research)

A2: No financial incentive for chemical manufacturers to introduce natural refrigerants.

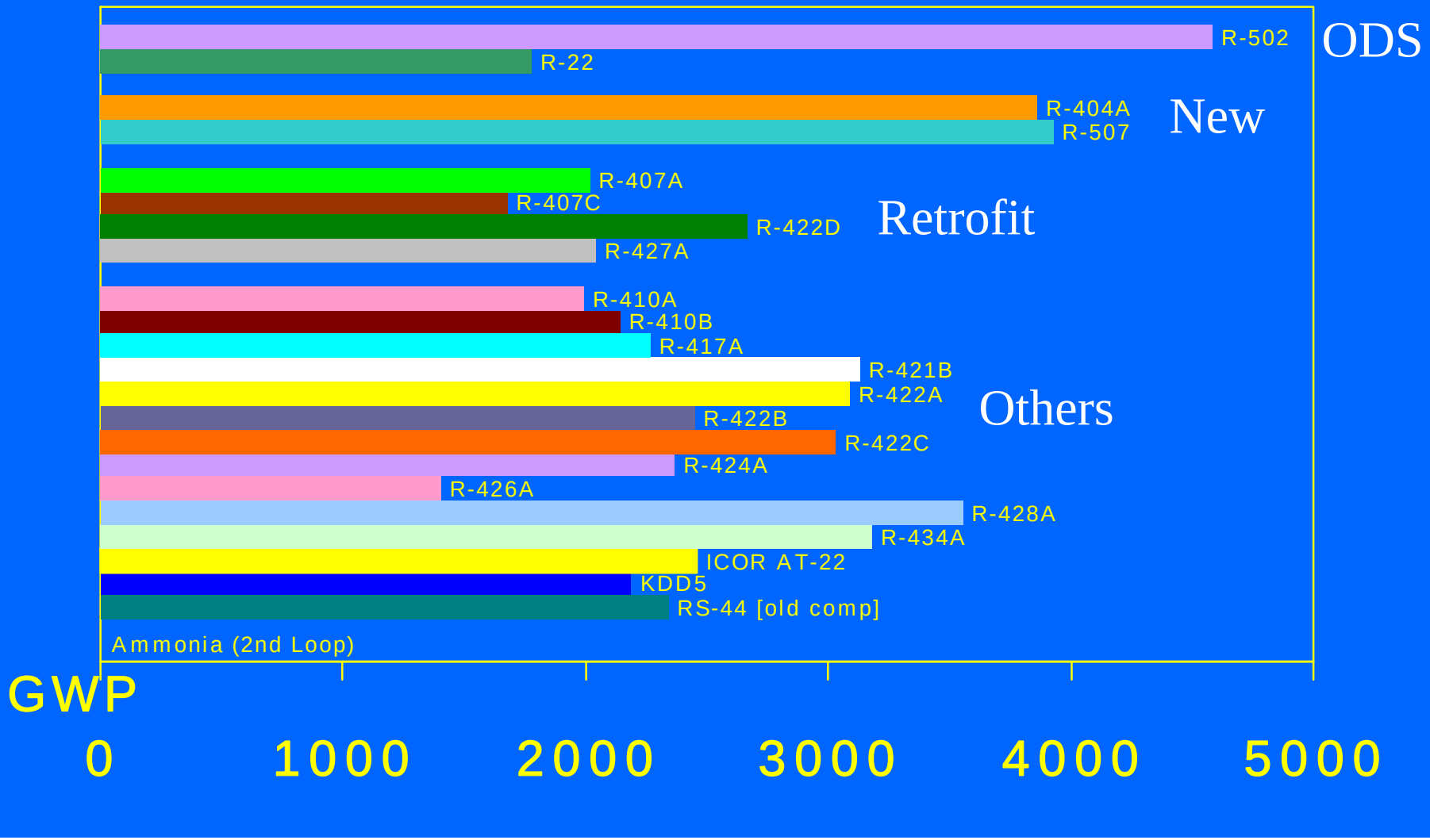
SNAP Achievements

- Health/safety and environmental benefits
  - Controlled workplace exposures to chemicals
  - Responsible use of global warming gases
  - Control over flammability risks
  - Alternative technologies reduce overall chemical use
- ~450 substitutes reviewed
- Provided industry with trustworthy information to assist in transition
- Received UNEP Innovators Award

Supermarkets and SNAP

- You can find on EPA's web site if SNAP has reviewed and accepted specific refrigerants or refrigeration techniques
  - www.epa.gov/ozone/snap/refrigerants/index.html
- Listings broken down by end use, like:
  - Retail food refrigeration
  - Cold storage warehouses
  - Refrigerated transport

Acceptable Refrigerants: Retail Food Refrigeration



Introducing New Refrigerants

- If you don't see a refrigerant on EPA's "acceptable" list that you want to use...
- Give us a call
  - Monica Shimamura, SNAP Coordinator (202) 343-9337
- Consider making your own submission
  - Forms and instructions online at www.epa.gov/ozone/snap/submit/index.html

What Can You Expect During EPA Review?

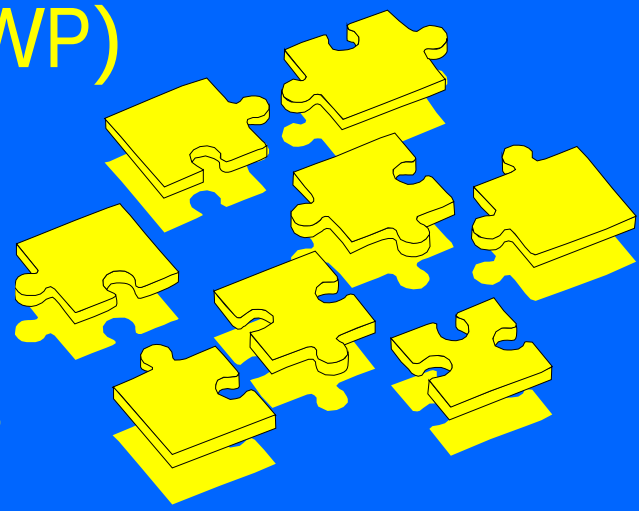
- Back and forth discussions with EPA
  - We encourage a conference call to discuss issues before submission
  - You may submit a draft application first
- You may make claims of confidential business information
  - Make in writing at time of submission
- Technical reviews may take 2 months to a year or more

What Can You Expect During EPA Review? (con't)

- EPA typically sends two letters:
  - Completeness determination
  - Preliminary listing
- Once a submission is complete, EPA has 90 days to finish our review
  - After that, you may sell a substitute in specified uses
  - A substitute may be used pending EPA's final decision
- Final outcome: a final decision in the *Federal Register* and a listing on EPA's web site
  - "Determination of acceptability" usually takes 6 months or less
  - Legally binding regulations take 2 years or more

What Does SNAP Consider?

- Ozone depletion potential (ODP)
- Global warming potential (GWP)
- Toxicity
- Flammability
- Other environmental impacts



Toxicity and Flammability

- How toxic is the substitute and how likely is human exposure?
  - Workplace, consumer exposure
  - Compare projected exposures (typical, worst-case) to exposure limits (e.g., PEL, TLV, WEEL, RfC)
- Is there an unusual flammability hazard?
  - Compare projected exposures (typical, worst-case) to lower flammability limit
  - May need to analyze magnitude of risks or ways of avoiding them

Current Reviews of Natural Refrigerants

- Hydrocarbons
  - HCR-188C, isobutane in household refrigerators and freezers
  - Propane in commercial ice cream cabinets
- CO_2
  - In a water-cooled propylene glycol chiller
- Ammonia
  - Not currently under review
  - NH_3 vapor compression w/2ndary loop already acceptable in retail food refrigeration
  - NH_3 vapor compression w/2ndary loop, NH_3 absorption and NH_3/H_2O absorption already acceptable in cold storage warehouses

Advice on SNAP Application

- Sticking points in recent submissions
  - Training and warning signs
    - Will industry develop a general training program for natural refrigerants?
  - How to recapture the refrigerant
  - Risk assessment
    - Scenarios for technicians fixing or disposing of equipment, consumer using equipment
    - Analysis of probability of fire or toxic release or an analysis of ways these can occur and how they can be avoided

Example Issues for Natural Refrigerants

- Should the refrigerant charge be limited?
- How to ensure that electrical mechanisms are unlikely to spark flammable refrigerants?
  - Require industry standards (UL) ?
  - Other requirements on the parts?
- What training and warning signs are needed?
  - Require trained personnel?
- How will alternative refrigerants be recovered?
- Should there be unique fittings for each refrigerant?

For More Information

- EPA SNAP Web Site
  - http://www.epa.gov/ozone/snap/
- Ozone Hotline: (800) 296-1996 in U.S.
- SNAP Coordinator: Monica Shimamura
  - (202) 343-9337
  - shimamura.monica@epa.gov
- SNAP regulations in subpart G to 40 CFR part 82; unacceptable or restricted substitutes are listed as appendices