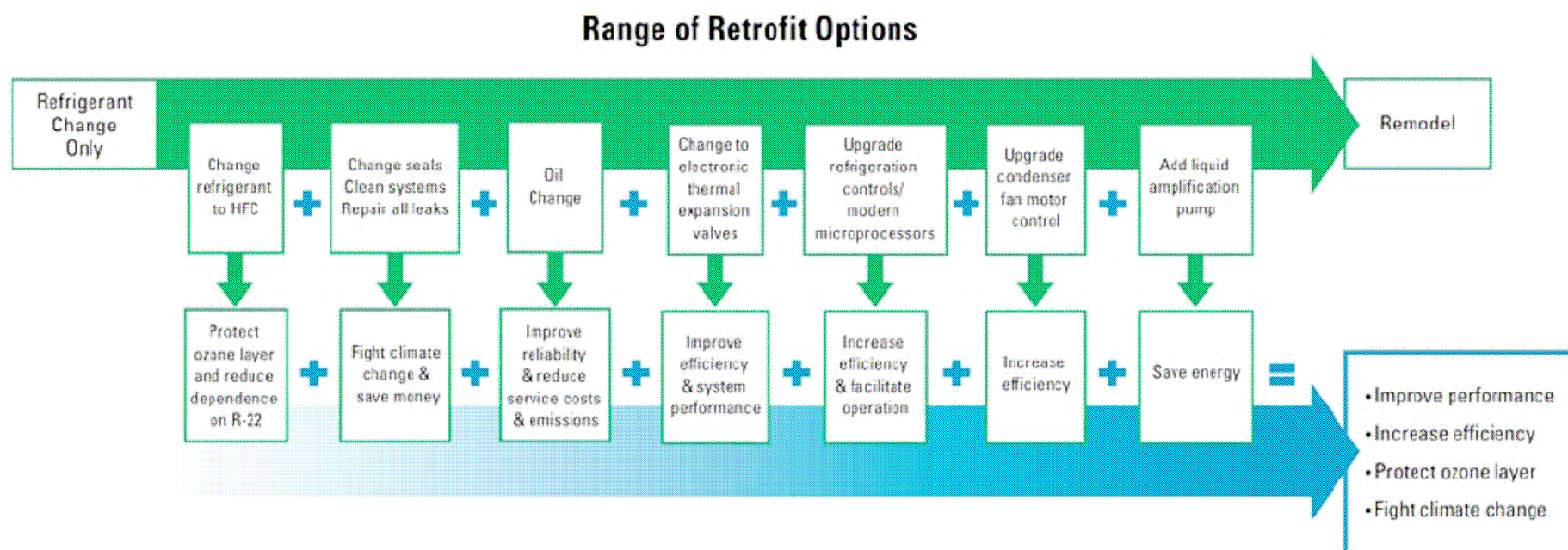




HFC Retrofit Options

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HFC Refrigerant Retrofit Options



There are two main approaches to retrofitting supermarkets from HCFC-22 to HFCs:

1. Replacing only the refrigerant with minimal changes or adjustments to the refrigeration system.
2. Using new mechanical systems, which may include compressors, condensers and refrigerated cases, along with a change to an HFC refrigerant.

HFC Refrigerant only Retrofit

Advantages

- Minimal Retrofit Costs
- Minimal disruption to store ops
- Possible lower discharge temps
- Zero ozone depleting refrigerant

Disadvantages

- Possible efficiency decline
- Possible oil change required
- Possible compatibility issues with seals and valves

Retrofitting with new mechanicals will help reduce issues related to new HFC refrigerants and help improve efficiency.

1. Improving control strategies- floating head pressure control, liquid amplification, etc.
2. Advances in compressor and motor design, improved microprocessor controllers, variable frequency drives

Reducing leaks is also a useful while completing a retrofit, it reduces cost and helps the environment by reducing greenhouse gas emissions

Factors to consider when doing retrofits

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- **Capacity**- what is the available capacity?
- **Efficiency**- there may be a reduction in capacity with a retrofit from HCFC 22
- **Mass Flow**- could be an issue for expansion device selection
- **Equipment change**- will there need to be a change due to extreme differences in capacity, mass flow, efficiency, etc.
- **Lubricant Compatibility**- understanding of oil return when retrofitting is important
- **Compressor Mfctr Approval**- Understand the compressor manufacturers recommendations
- **Global warming potential**- Effect of emissions on the environment
- **Disruption to store operations**

Value/Cost Calculation

First Cost

- **Labor-** Engineering, Installation
- **Materials-** Refrigerant quantity, Oil, Expansion valves, etc.

Future Operating Costs

- **Energy**
- **Compressor Life**
- **Service Refrigerant Cost**
- **Service Labor Cost**