



Business Case for  
Natural Refrigerants

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11-12/04/2018 – Beijing

**王雷**

**WANG LEI**

**中国家用电器协会**

**China Household Electrical Appliances Association**



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**为了美好的明天**

For a better tomorrow.

**天然工质在中国家电行业的应用**

Application of Natural Refrigerants in China's  
Home Appliance Industry



## 关于中国家用电器协会 About CHEAA

1988年成立，家电制造商的行业组织，社团法人。

Established in 1988, CHEAA is an industry association of home appliance manufactures.

**主要产品类别：**家用制冷冰箱、冷柜；房间空调器；洗衣机；家用热水器（电热、燃气、热泵、太阳能）；厨房电器；卫浴电器；美健电器；小家电等，及关键部件，如压缩机、电机等

Product range: refrigerators, freezers, room air conditioners (RAC), washers, electric water heaters(WH), gas WH, heat pump WH, solar-powered WH, kitchen appliances, bathroom appliances, personal care appliances, portable appliances, key components such as compressors and motors

2017年家电主营业务收入达到1.51万亿元，增长18.7%，出口额624.5亿美元，增长9.9%。

In 2017, China's home appliance industry saw revenue of 1.51 trillion RMB, a YOY rise of 18.7%, and export value of 62.45 billion US dollars, a YOY rise of 9.9%.

国家统计局数据,2017年主要家电产量，冰箱8670万台，同比增长13.6%，空调1.8亿台（?），同比增长26.44%，洗衣机7500万台，同比增长3.15%，热水器6050万台，同比增长8%

According to statistics from National Bureau of Statistics, output of refrigerators posted 86.7 million units in 2017, a YOY rise of 13.6%, air conditioners 180 million units, a YOY rise of 26.44%, washers 75 million units, a YOY rise of 3.15% and WHs 60.5 million units, a YOY rise of 8%.



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## 行业当前特点 Industry Characteristics

**家电企业创新能力不断增强。产品在向高端、智能、健康、节能环保、时尚方向升级。**

Currently, this industry features an increased innovation capability, and products that are going high-end, smart, health-oriented, energy efficient, environmental friendly, and stylish.



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## 制冷剂涉及产品 Related products

**涉及制冷剂的产品：冰箱、冷柜、空调器、除湿机、热泵热水器、洗衣干衣机；**

Refrigerants are used in refrigerators, freezers, ACs, dehumidifiers, heat pump WHs, and washer & dryer combos

**涉及发泡剂类产品：冰箱、冷柜、热水器**

Forming agents are used in refrigerators, freezers and WHs.

**家用电冰箱成功应用HC600a，HC290成为冷柜行业的新选择；房间空调器替代工质选择了HC，CO2和HC290还将应用于家用热泵热水器等。**

HC600a has been applied in refrigerator sector. HC290 has become a new option for freezer sector. HCs has been chosen as a replacement in RAC sector. CO2 and HC290 will be used in HPWH, etc.



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## 为什么选天然制冷剂 Why natural refrigerants

“坚持人与自然和谐共生”是新时代中国特色社会主义思想的基本方略。政府报告中“我们要携手行动，建设天蓝、地绿、水清的美丽中国。”

“Ensuring harmony between human and nature” is a fundamental principle of socialism with Chinese characteristics in the new era. According to China’s Report on the Work of Government, “We all need to join hands and take actions to build a Beautiful China where the skies are blue, the land is green, and the waters are clear.”

**政策趋势：基加利修正案HFCs管控；欧盟F-Gas法规**

Policies trend: Kigali Amendment on controlling HFCs; EU F-Gas Directives

**天然制冷剂能全面满足：保护大气臭氧层，减少温室气体排放，履行国际公约的环保要求；中国政府的环保要求；企业的社会责任；出口市场的要求。**

In accordance with the requirements of international treaties and the Chinese government, natural refrigerants contribute to ozone layer protection and the reduction of GHGs. Using natural refrigerants is out of the social responsibility of enterprises, and it meets the demand of export markets.



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## 为什么选天然制冷剂 Why natural refrigerants

行业持续发展的要求:

在趋势面前只有通过技术进步，才有持续发展的主动权；制冷剂替代技术的应用研究促进新技术、新材料的应用，挑战并逾越技术壁垒和贸易壁垒，促进行业技术创新、突破发展。

Using natural refrigerants reflects the demand of industry progress. Amid this trend, only through technological improvement, enterprises could take the initiative of sustainable development. The R&D of replacement technologies will help promote the applications of new technologies and new materials, overcome technology barriers and trade barriers, and advance the innovation and development of industry technologies.

制冷剂本身的特点:

制冷性能好，R600a可提升冰箱能效；HC290用于制冷能效高！不仅高效，空调器还适合用于高温地区；冷柜，低温可轻松降到-40°C；热泵热水器，在寒冷地区的热热水出水温度上有明显优势。HC290的工作压力低，在安全方面也是一大优势。

Characteristics of natural refrigerants:

Strong cooling performance; improved energy efficiency of R600a-based refrigerators; high COP of HC290; HC290-based ACs are applicable in high ambient temperature areas; down to -40°C for HC290-based freezers; high outlet water temperature of HC290-based HPWHs in cold areas; low operation pressure, which brings HC290 an advantage in safety.



**政府：政策引导，积极履约，管理与支持，项目推动，组织培训，配额管理。**

Government: policy guidance; fulfilling international treaties; management and support; project advancement; training organizing; quota management

**协会：推动行业技术转换和升级：开展国际国内交流认清趋势；组织制定产业技术路线，明确方向；完善标准体系修订标准；开展公共宣传；协助政府开展履约工作；推广环保低碳标识。**

CHEAA: advancing technology transfer and upgrade; organizing industry exchanges at home and abroad; developing industry technology roadmap; establishing a standard system and revising related standards; making publicity; facilitating the government in putting place international treaties; promoting the application of eco-label.



冰箱、冷柜、热水器发泡剂： CFC止于2007年；之后HC为主，小部分HCFC-141b；近年HFC-245fa替代HCFC;现在正用HFO替代HFC；

Forming agents used in refrigerators, freezers and WHs: CFC (before 2017); HCs (mainstream) and HFC141b (a few proportion) afterwards; HFC-245fa (a replacement of HCFCs in recent years), HFO (a replacement of HFCs currently)

冰箱： CFC止于2007年；小比例的HFC134a； R600a始于1996年， 2002年成为主流，目前占比超过90%。

Refrigerator sector: CFC (used before 2007), HFC134a (taking up a few proportion), R600a (Introduced in 1996, it now becomes the mainstream refrigerant, accounting for more than 90%).

冷柜：CFC止于2007年；之后HFC134a与R600a 为主；近年R290开始替代HFC

Freezers: CFC (used before 2007), HFC134a and R600a (mainstream refrigerants), R290(used as a replacement of HFCs in recent years)



冰箱行业，由于采用天然工质，以每年的产品量减排温室气体约为8亿多吨二氧化碳当量，正在探索发泡材料替代HFC

Refrigerator sector: Calculated by production-based accounting, this sector phased out more than 800 million metric tons of CO<sub>2</sub>e of GHGs thanks to the use of natural refrigerants. Currently, this sector is exploring forming replacements of HFCs

**空调：曾经100%HCFC-22；目前60% HFC-410a，少量HFC-32；HC290已经用于除湿机、移动空调；分体空调HC290少量进入市场；**

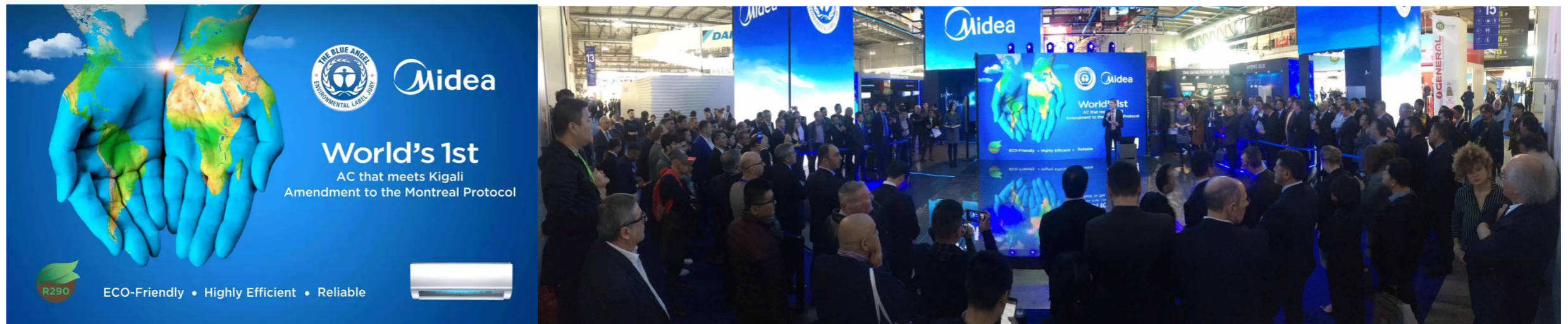
ACs: HCFC-22 (once used across the AC sector); HFC-410A (60%), HFC-32 (a few proportion); HC 290 (already used in dehumidifiers and portable ACs; a few HC290 split ACs have been placed on the market).

**热泵热水器： HCFC-22、 HFC-410a 、 HFC134a**

HPWHs: HCFC-22, HFC-410A, HFC134a

空调行业，把HC作为替代技术路线，技术研发、生产线改造；积极开展市场推广

AC sector: This sector is using HC as a replacement, with technology R&D, production line conversion, and active marketing in progress.



美的空调于2018年3月14日，在意大利米兰国际暖通空调及制冷展（MCE）上被蓝天使认证机构正式授予官方认证书。

AC of Midea was awarded with the Blue Angel Ecolabel at MCE on March 14<sup>th</sup>, 2018



# 挑战和机遇 Challenges and opportunities

## 挑战 Challenges

商业利益 Commercial interests

空调的安装维修 Installation and Maintenance of ACs

标准 Standardization

市场化 Commercialization

## 机遇 Opportunities

政策利好; Favorable policies

新材料发展、制冷技术的进步、智能化技术的发展; The development of new materials, cooling technologies and smart technologies

全球消费者对美好生活（物质水平和环境质量）的追求 Global consumers' demands of improved living quality physically and environmentally



## 前景 Prospect

**在正确的道路上扎实前行，必将有美好的未来!**

Forging ahead on the right path, the future will be promising.



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**Thank you very much!**

联系方式: [wanglei@cheaa.org](mailto:wanglei@cheaa.org)