

Overview of supported cooling technologies

The following tables summarize the main cooling technologies and potential sectors that can be supported by Cool Up (non-exclusive).

Air conditioning

Sector	Compatible	Remaining years
Central chillers	Compression chillers: HC (R290), ammonia (R717), water (R718), absorption chillers, or other not in-kind technologies without fluorinated refrigerants	Hotels, offices, hospitals, universities, data centres, and other large buildings with central cooling supply New buildings and refurbishments
Single split units	R290	Residential, hotels, offices, hospitals, official buildings, universities, and other buildings with decentral cooling supply New buildings and refurbishments
District cooling	Ammonia (R717) compression chillers, absorption chillers, direct cooling (e.g., by seawater)	New districts (different building types), and conversion of existing district cooling systems to systems with natural refrigerants
Passive cooling	Ventilation concepts and concepts using direct ground cooling	Residential buildings

Commercial refrigeration

Technology	Possible applications and projects	Potential sectors
Centralized systems	Trans-critical CO ₂ Cascade system R290/subcritical CO ₂ other solely using natural refrigerants	Supermarkets, commercial storages
Condensing units	Positive and negative cold rooms, CO ₂ /water loop systems other solely using natural refrigerants	Supermarkets, commercial storages, shops, large restaurants/hotels
Hermetic commercial units	Standalone units e.g., glass door refrigerators, open front and top coolers, ice-cream freezers, wine coolers, vending machines, post mix units, etc.	Supermarkets, small shops, restaurants, hotels, bars, on-the-go

General

Technology	Possible applications and projects	Potential sectors
All	Support local manufacturers of cooling appliances with the conversion to natural refrigerants	Local manufacturers of cooling appliances (commercial refrigeration and AC)
All	Commercial service sector development for handling flammable refrigerants, with focus on hydrocarbons	Commercial service sector
Monitoring solutions*	Monitoring solutions for energy and cooling performances to improve and evidence the efficiency of systems using natural refrigerants.	Various

**All Cool Up supported demo projects will be monitored. Furthermore, implementation of a monitoring can also be a separate demo project. Precondition: Refrigeration with natural refrigerants or not in kind technologies".*

For all Cool Up supported demo projects potential energy demand reduction measures and renewable supply will be examined (e.g., also including integrated systems using the excess heat).