Natural Ventilation with Background Ventilators & Intermittent Extract Fans (System 1)

A hybrid ventilation strategy combining *passive background ventilators* (e.g., trickle vents in windows or walls) with *intermittent mechanical extract fans* in high-moisture areas (e.g., kitchens, bathrooms). This system provides continuous low-level airflow (background ventilation) and targeted extraction during pollutant-generating activities (e.g., cooking, showering).

Key Components

1. **Background Ventilators**
   - Small, adjustable vents installed in windows, walls, or eaves to allow passive airflow.
   - Typically sized to meet minimum airflow requirements per room (e.g., 2500–5000 mm^2 equivalent area).
   - **Example:** Trickle vents in retrofit double-glazed windows to comply with Part F without compromising thermal performance.
2. **Intermittent Extract Fans**
   - Mechanically driven fans activated manually or via humidity sensors in wet rooms.
   - Minimum extract rates: 15 l/s for bathrooms, 30 l/s for kitchens.
   - **Example:** A humidistat-controlled fan in a social housing retrofit to reduce condensation and mould risk.

Real-World Applications

- **New Builds:** In a two-bedroom house, habitable rooms (e.g., bedrooms, living rooms) require background ventilators, while extract fans are installed in kitchens and bathrooms.
- **Retrofits:** Upgrading 1970s terraced housing by adding trickle vents to windows and replacing outdated fans with low-noise, energy-efficient models to meet modern standards.

Regulatory Compliance (UK)

- **Approved Document F:** System 1 is the baseline solution for dwellings, ensuring minimum airflow rates and moisture control.
- **Energy Efficiency:** Background ventilators must be closable to prevent heat loss, aligning with Part L (conservation of fuel and power)

Advantages & Challenges

Advantages	Challenges
Low installation cost compared to mechanical systems	Risk of under-ventilation if vents are blocked or fans not used properly
Simple maintenance for homeowners	Less effective in airtight buildings (e.g., post-retrofit homes)
Flexibility in retrofit projects	Noise from extract fans in poorly insulated installations