RESILIENT HVAC:

PREPARING AUSTRALIA’S BUILDING SERVICES FOR A CHANGING CLIMATE

PHIL WILKINSON
Executive Manager - Government Relations and Technical Services AIRAH
About AIRAH

Vision
Safe, sustainable, healthy and comfortable built environments.

Mission
To provide leadership, promotion, representation and support to the air conditioning, refrigeration, heating and related services industry and membership.
Strategic aims

1. Promote and develop tomorrow's efficient, productive and resilient industry
2. Grow industry skills and capability for the future
3. Inform regulation and policy processes
4. Build member value and engage members
AIRAH – industry leadership

1. HVAC&R Resilience
2. HVAC&R Sustainability
3. HVAC&R Compliance
4. Innovation and Research
5. Transition to low gwp refrigerants including PRIME
AIRAH today…

• **specialist organisation for air conditioning, refrigeration, heating and ventilation professionals**
• 2500 members
• 25,000 publications distributed monthly
• Professional development
• Industry accreditation schemes
• National / International conferences
• Technical publications
• Government collaboration
• Membership activities / trade nights
• Highly regarded objective technical experts working with government
• **Members from whole HVAC&R supply chain**
Why does resilience matter to building services?

• Australia’s built environment will need to become more resilient
  • Heatwaves, cold snaps, floods, storms, bushfire
  • Other emergency events resulting in utility outages

• The changing face of the built environment
  • Places of refuge – Stockland Cairns in Cyclone Yasi
  • Public services – hospitals

• The HVAC&R Industry plays an important role
  • Safeguarding building occupants during extreme conditions
  • Providing a clean and healthy indoor environment until outdoor conditions are safe
How does this impact building services?

• **Heat**
  • Building overheating – increased requirements for cooling
  • Increased energy and water demand
  • Impact on thermal performance and comfort
  • Impact on external surfaces/cladding
  • Increase in maintenance
  • Increased requirements for cooling and areas of respite
  • Increased heat stress events amongst building users
  • Demands on network – increase in blackouts disrupting operations
  • Reduced productivity and business continuity

• **Water**
  • Increased flood events limiting access and egress
  • Greater intensity of runoff results in drainage capacity issues
  • Inundation of building and car park
  • Increase in maintenance
  • Changes to environment suitable for water bourne diseases and pest species distribution
  • Impacts to potable water supply
  • Reduced productivity and business continuity
How will this temperature increase affect buildings in Melbourne?

- Typical office building in Melbourne – internal temperature
How will this temperature increase affect buildings in Melbourne?

• Typical office building in Melbourne – energy and GHG emissions
How will this temperature increase affect buildings in Brisbane?

• What about in a Brisbane climate?

[Energy consumption chart showing an increase of 20%]

[Building model]
What are AIRAH doing to address this?

- Preparing Australia’s building services for a changing climate
- AIRAH Resilience Framework
- Whole of Supply Chain approach to tackling resilience
  - Integrated Building Design
  - HVAC&R Equipment
  - HVAC&R Installation
  - Facilities and Operations
How will we change the way that things are done?

HVAC&R Resilience Overview

INSTALL
- Elevate equipment above flood lines or flood protection
- Protect or relocate equipment on roofs
- Location to minimise heat island effect
- Secure external plant and ducts
- Harden external wiring and controls
- Access space/route to maintain and replace equipment

ENGINEERED
- Maximum operating temperatures
- Minimum operating temperatures
- Managing plant for extreme heat/cold
- Hail protection
- In-built system redundancy
- Corrosion protection
- Maintenance access/service facilitation

MANAGE AND OPERATE
- Knowledge and documentation
- Inspection and maintenance
- Vulnerability and risk assessment
- Plug and play systems
- Quick connects for temporary services
- Back-up power
- HVAC Shutdown/Start up procedures
- HVAC emergency mode(s)
- Legionella/Microbial control
What to take away…

- AIRAH are thought leaders in resilience for the building services industry
- Life cycle philosophy: Design, Engineer, Install, Operate
- Stakeholder engagement is critical to the success
NCCARF CoastAdapt Tool