Hydronics 101

• all about how water improves the performance and increases the Life

- HVAC Systems
 - Resilience is about choice
 - and Sustainability is about capability

Energy saved is about moving "HEAT" quick and easy



- Cooling that hot skillet –
- what is faster?

Drop into 100-120°F dishwater or waving around in Air at 70 ° F ?

Commercial buildings aren't like Houses

- The Owner Requirements vary, and the space requirement may change
- Water improves efficiency wherever used
 - The central system matches to all utilities and renewables
 - Insulates the HVAC system from weather
 - Is demand limiting by design
 - Energy use is predictable
 - Most equipment is indoors, protected, more resistant to damage
 - Enables whole building heat recovery and energy sharing, and logic
 - Distribution of comfort water uses 10% of the horsepower of Duct or refrigerant tubing
 - Terminal units every type from direct to forced air, to radiant, or convection
- Resilience is about options and hydronic systems are all about options now and in the future

Resilience and Risk Management

Resilience requires choice

- Fuel source what's available Hydronics matches ALL
 - Primary and backup
 - Renewable or storage
 - Natural or manmade
- Conditioning type Hydronics delivers ALL
 - Is the task people and what activity
 - Building or space function or safety
- System Type central or unitary or hybrid Hydronics matches ALL

Risk reduction

• Cost and Options enable Management

Resilience and Risk Management



Costs – Competition a key to Resilience and Sustainability

Proprietary is anti-resilience

Bid process – "or equal"
Not just at time of bid – BUT for the life of the building

Installed Cost

Contractors from General to Mechanical, electrical to controls hydronics is proven

Commissioning agents to Code Officials – Hydronics matches ALL

Operation and Maintenance Hydronic Systems deliver predictable utility bills

Facility management or service contracts are readily available – competitive

For the life of YOUR building

Resilience and Risk management

- Beneficial Electrification is about using less energy
 - LESS of whatever fuel is available
 - It is not OK to waste energy USE LESS is the key
 - Hydronic systems use less energy and enable sharing
 - Lowest transport of comfort
 - Highest efficiency components
 - System designed to maintain efficiency level and increase life
 - Short lived equipment ruins all ROI calculations
 - Systems designed to reduce lift
 - Lift?
 - The difference between a fluid entering a component and changing it to what is required
 - Hydronic systems have the lowest lift or designed with the lowest delta-t
- The most resilience HVAC systems are district or campus systems, and all are hydronic based

Hydronics 101 – Modeling and Education

| Hydronics have advantages and HIA-C mission is to Enable Informed Decisions | Education AND THE TOOL – BEST, Building Energy Efficiency System Tool™ • Hydronic is not always the answer • HIA-C does not choose what fuel and at what cost – You do • HIA-C does show all the Basic HVAC systems in comparison to • Each other as you choose • Against common criteria that you input |
|--|---|
| BEST efficiency to energy to budgeting and costs | The platform is FREE The input is current industry practice The Output depends on you challenging your design team Define the high-level HVAC system Match to YOUR costs installed, operated and maintained Five Minutes for the life of your building www.hia-c.org |