ENERGY CONSERVATION

in

ARCHITECTURAL DESIGN

Presented by,

ICR Engineering Services Ltd.

Kofi Asante,
Director
Outline

- The Architect/Owner
- Implication of architect’s decision
- Energy – An operating cost
- Why energy conservation/energy efficiency?
- Renewable Energy in design
- Examples – Energy Conservation Measures
- Conclusions
- Recommendations
The Architect

- Owner/architect
- Impressions
- Design Concepts
- Utility – industry, laboratory, humidity,
- Sustenance
Implication of Architect’s Decisions

- Aesthetics
- Building structure
- Orientation
- Mechanical, electrical, plumbing, controls
- Space comfort
- Type of energy systems selected
- Initial and operating costs
Energy - An operating cost

• Sources
  – Equipment operation – controls, time of use, etc
  – Structure
  – Maintenance
  – Technology
  – Initial cost
  – Replacement cost
Why Energy Conservation?

- Optimize operating costs
- Improve efficiency – building, equipment, etc.
- Modernization
- Renovations
- Greenhouse gas (GHG) reduction
- Sustainable development
Energy Conservation

• Equipment – Lighting, air conditioning systems, etc.
• Power sources
• System Controls
• Cost of power
• Availability
• Sustainability
Examples – Energy Conservation Measures

• Building orientation
• Structural changes
• Renewable power sources
• Fuel switching
• Hot water generation
• Fenestration
• Energy efficient equipment & controls
Energy-Efficient Equipment & Controls

- Secure the tenant/owner’s consent
- Lower operating cost
- Uses less energy
- Opportunity for Greening of building
- Good control of equipment for additional savings
- Prefer knowledgeable architect
- Design-built contract increases opportunity
Hot Water Generation - Solar Utility

- Insulated water storage & pumping
- Hotels – kitchen, laundry, rooms
- Schools
- Apartments, other residential
- Boiler – preheat water
Orientation & Equipment Selection

Cooling in the SUN
Cooling in the Sun (cont’d)
Roofing - Heat Cavities to Cool
Renewable Energy in Design

- Consumes no fossil fuel
- Produces power without noise, smoke or pollution
- Requires little maintenance
- No moving parts, lasts longer compared to generators
- Power is readily available when required.
- Safe – no risk of fire associated with fuels for generators, lanterns and candles
- With rising cost of crude oil, solar electricity, eg. is economical for many small applications
Conclusions

• Architect/owner is very important
• Include energy conservation in analysis
• Good management of process
• Consideration to minimize costs
• Sustainability is key
Recommendations

• Design for lower operating cost
• Avoid greenhouse gas generation
• Work with financier for best results
• Include Renewable Energy sources as applicable
• Consult with energy efficiency experts
Thank you

kasante791@hotmail.com

and/or

icreinfo@gmail.com

www.icreservices.com (under development)