ARCHITECTURE AND ENERGY-SAVINGS

Architecture is our 'third skin' (after skin & clothing). Buildings have a direct effect on healthy living. Poor ventilation, High heat transfer coefficient of building materials lead to condensation & structural Damage. Coupled with the oil crises leading to regulations; reserves & resources are limited; pledge to reduce fossil fuel consumption & CO_2 emission, Energy efficiency – its saving and optimum usage – closes the gap between future supplies & increasing demand

Thermal insulation measures pay for themselves through energy savings.

A Building is an Energy System: a Balance of Energy is inherent in the system. This calls for a new standard for architecture and architects, not a special method of construction or design. Greatly reduced heating / cooling requirement compared to the norm.

The technical challenge comprises of satisfaction in all the below areas:

- Compact design: surface-area-to-volume ratio
- Energy-efficient construction: minimizing the U-values, avoiding thermal bridges
- Excellent thermal insulation in the external components: high insulating efficiency per unit area
- Wind-tight and air-tight building shell
- Mechanical ventilation (heat recovery in some cases): limit the relative air humidity
- Rapidly controllable heat / cold distribution: adaptability

The architectural challenge comprises of

- Synthesis of technically perfect construction
- Correct use of materials
- Sensible utilization
- Efficient production planning

Effectively, it boils down to giving the design processes a specific direction governed by external factors:

- **Conservation of resources**
- **Climate protection**
- **Energy efficiency**
- **Develop a new aesthetic**

With the new role play of Architects as stylists and engineers, their responsibilities widen to

- **Create** appropriate architectural designs from it. Not simply "Form follows U-value".
- **Author** New developments, e.g., in the styling of facades of large, complex buildings
- **Design** an energy system, a "power station", a "living system" that can respond to changes in the environment
- **Turn** the technical requirement to a style challenge

Architecture has always been closely linked to social requirements and social change. Energy efficiency in architecture would be inconceivable without the use of insulating materials. Optimum energy efficiency can be achieved with high-performance insulating materials such as polyurethane rigid foam. A building and its shell constitute a system with a long life and a correspondingly long-term energy-saving effect. Rapid wear is inherent in cooling systems and therefore short renovation cycles. In the long term, a building with a low heating or cooling requirement is in any case "equipped" for the anticipated energy shortage.

Integrated planning and realization is the key to eco-friendly & cost efficient construction. Unless sufficient time and energy is spent in the Analysis & Planning stage, the benefits of the exercise will not be realized fully.

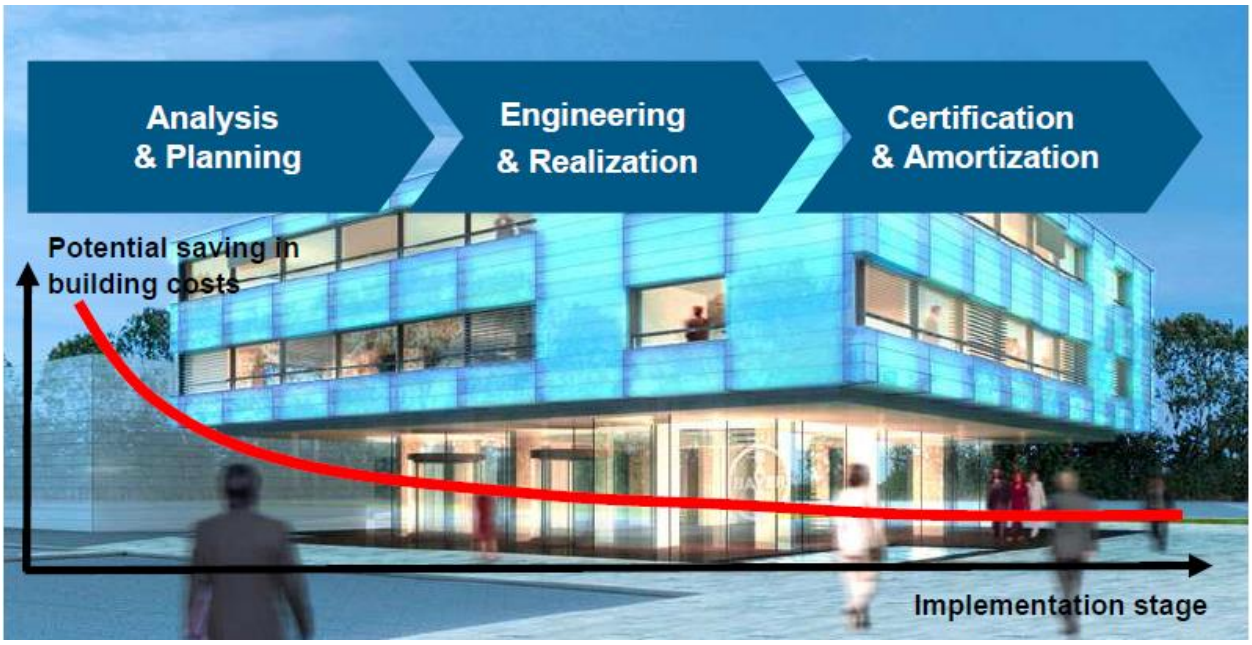

Figure 1 The more time you spend at the Analysis & Planning stage, the more effective your chances of achieving your goals.

Therefore, a holistic approach to building envelope with energy-saving materials is important. The goal is 'towards zero emission'.