

'SEED' * Positive Energy Buildings

* Sustainable, Environment-friendly, Energy-efficient, Development
(SDI introduced this acronym in 1995)

1. Introduction

The World Business Council for Sustainable Development (WBCSD) has identified buildings as one of the five main users of energy where 'megatrends' are needed to transform global energy efficiency in the immediate short term, and so meet the daunting challenge of Climate Change Adaptation. They account for 40% of primary energy (primary energy includes the energy required to generate, transmit and distribute electricity, as well as energy directly consumed on site) in most developed countries, and consumption is rising. [2007 WBCSD Energy Efficiency in Buildings Project]

Nothing less than a complete cultural shift will be necessary throughout the European Construction Sector, beginning with all research and design disciplines and extending right across to any person who works on a construction site or has any part to play in managing, maintaining or servicing a building.

2. Burden Sharing for Different Building Types

Separate strategies are required to greatly improve the energy performance of:

- ◆ **existing buildings** onto which many energy efficiency measures can be successfully grafted, but they will not be cheap ;
- ◆ **buildings of historical, architectural or cultural importance** the integrity of which must be protected ; and
- ◆ **new buildings**, which must therefore carry the major burden.

3. The Paradigm for New Buildings - A 'Positive Energy' Return

Primary Energy Consumption is less than or equal to **15 kWh/m²/yr**.

Renewable Energy & Heating Systems then contribute a reliable quantity of energy, per year, which covers the following:

- a) the Building's **Primary Energy Consumption** ;
- b) an **Energy Efficiency Degradation Factor** which takes account of the degradation in energy efficiency
 - i) normally expected during the life cycle of renewable energy and heating systems installed in the building. The rate of degradation will depend on the quality of maintenance and servicing ; and
 - ii) caused by wasteful patterns of building management and/or use ;
- c) the energy consumed by **Private Transport** associated with the building ;
- d) an **Energy Return** to an Intelligent District or Regional Grid exceeding, by a whole number multiple determined by reference to local conditions, the total energy consumed by the Building (including its Energy Efficiency Degradation Factor) and any associated Private Transport.

Uniquely, this more practical elaboration of the innovative concept of **Positive Energy Buildings** considers life cycle energy efficiency degradation.