Module 7 – Assignment 2
Industrial Ecology and the Built Environment

Find an example of dematerialization in action in construction industry. Describe the process and discuss perceptions of benefits and difficulties associated with its implementation.

The word dematerialization is often broadly used to characterize the decline over time in weight of the materials used in industrial end products. One may also speak of dematerialization in terms of the decline in “embedded energy” in industrial products. Practical examples of the dematerialization trend are the steadily declining size and increasing power of computers, or the nearly 20 percent drop in the average weight of U.S. automobiles between 1975 and 1985 and micro structural engineering of smart materials is yielding ever lighter, higher-performance components. Wernick, in his study states that the German cabinet manufacturer, Kambium Furniture Workshop Inc., provides a prime example of reducing environmental stress at the manufacturing stage by directly incorporating renewable sources into its electricity supply, and avoiding synthetic chemicals for treating wood. Structural components that utilize dematerialization strategy include lumber-saving wood joists and steels of smaller cross section to support structural loads.

The use of steel in two major industrial activities, namely, construction and automobile manufacture, clearly has been in decline. This significant dematerialization trend has come about by virtue of the use of lightweight, high-strength alloys, and synthetics as substitutes for steel and cast iron. The trend is especially evident in the automobile industry where large weight and size reductions were achieved by materials substitutions in the 1970s in order to conserve
energy. In the construction industry, however, caution must be exercised in associating the
decline in steel use with dematerialization, because such a decline could be indicative of the
increased popularity of concrete over steel as the basic construction material for aesthetic,
technical, or cost reasons. On the other hand steel high-rise buildings today require 35 % less
steel than the same building would have required two decades ago. The market for family houses
with a steel frame has increased a lot in the USA. Low quality and problems with the tolerances
of structural timber together with rising prices for sawed timber are some of the reasons. Also in
the multi-storey residential buildings, up to 4-5 storeys high, the wooden frames are beginning to
be substituted with a load-bearing frame of light-gauge steel shapes. Another reason to grooving
market shares for steel in housing is the good environmental qualities. It has a low waste at the
construction stage and low life-cycle costs but also the fact that 70 percent of structural steel is
made of recycled steel.

On conclusion, especially the structural steel is a good example of the dematerialization
in action in construction industry. This process of dematerialization provides time and energy
efficiency through the construction process and also lessens the structural weight in other words
the dead loads of the steel buildings. However there are some difficulties of processing
dematerialization in the construction industry. These difficulties are usually emerging from the
minimum physical requirements of the buildings, interior and exterior spaces, and their structural
systems.