

## Trend Prediction:

# Identify Opportunities to Innovate and Solve Significant Problems!



I read an article on Green Tech, ET Prime about the unfortunate environmental cost of transporting vaccines, life-saving medicines, and perishable items. The constant refrigeration leads to higher fuel consumption (mostly diesel), as the cooling units are directly powered by the vehicle's engine.

Is there a cleaner way to do this? Can the potential emission loads from transporting food and medicines in refrigerated units be reduced?

Phase-change materials (PCMs) can possibly offer a solution. These are the materials that absorb or release latent heat when they change phase from solid to liquid or vice versa.

Use of PCMs in cold chain logistics is being attempted by several organizations globally as well as in India. This solution changes a few elements (in this case the material) of the current system being used for cold chain logistics such as the container/s used to store the medicine/ food item during transportation.

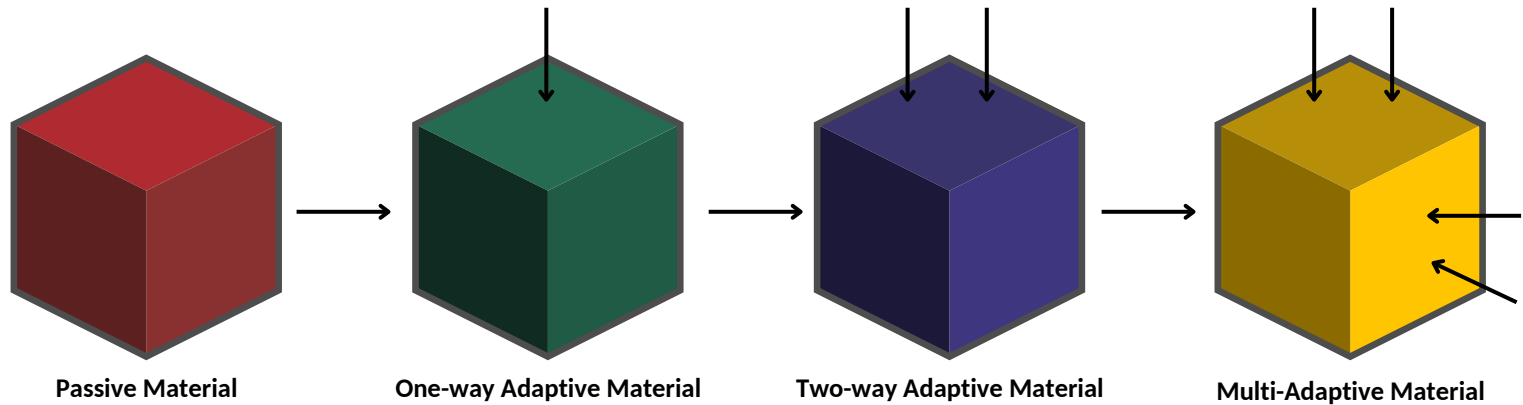
**What if could get at such a solution and even better solutions by understanding the “evolutionary potential” of the system and its elements?** Understanding It would help break the current frame of thinking and enable breakthrough solutions.

**The key lies in the following: System evolution is not random, It follows certain patterns, Different stages can be predicted, This knowledge can help solve problems, It can also help define strategic opportunities.**

**Science recognizes that a system evolves in physical space, on time scale or at the interface between system components. The patterns in these evolutions have been captured under certain “Technology Trends”.** Science has identified 31 such technology trends which can be used to track and innovate development of products, services and businesses.



Since we are talking of PCMs and Smart Materials, it would be pertinent to share **one of the Technology Trends - "Smart Materials"**. See the stages of evolution of this trend in the picture below.



This relatively new trend is the result of advances in material sciences fueled by the ubiquitous nature of sensors, which are making systems more responsive and flexible. Rheopexic, thermochromic, electrochromic and shape memory alloys/polymers are combined with the Internet of Things to produce a new breed of smart materials. This enables products to sense changes in external factors, communicate amongst themselves and adjust their performance accordingly. For example, multi-adaptive windows change their properties (cool, heat, block UV, etc.) based on the amount of sunlight and mode of operation.

**Each of the technology trends are associated with different stages of evolution. These stages can be used to assess the development or maturity of a product / business along that trend. Subsequently, this can throw light on the opportunities for improvement and areas to focus on for the same.**