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Stem Technology Initiative for sustainable energy future based on smart chemistry of oxides

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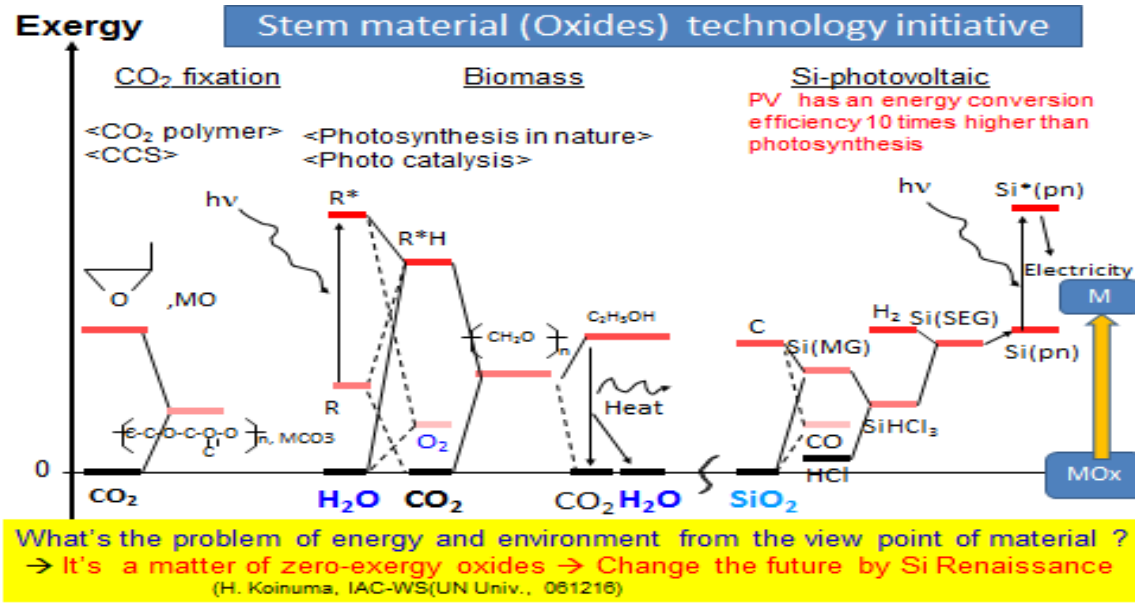
Crystal engineering of oxides by combinatorial laser MBE can be the stem technology initiative of materials [1] Every living thing preserves its life in a pseudo-steady state flow of energy and material to form a universal cycle for regenerating its origin, i.e. stem species from the final product in the life cycle mostly with the aid of solar energy. People start thinking about a serious problem caused by losing the energy-material balance due to the rapidly growing fossil fuel combustion, which inevitably resulted in CO_2 accumulation. As we could assign the stem cell to be every derivative of animals and plants, we will be able to apply stem concept to every smart materials from organic to inorganic (non-living) materials. Although there is a big difference in the life span, metals, and semiconductors are reduced from oxides, aged (stained) and returned into the most stable compounds: oxides under the terrestrial conditions. As the stem technology initiative, we propose the scheme illustrated in the Fig.. The main focus is on SSB (Sahar Solar Breeder plan: http://www.ssb-foundation.com) to start working with north African and central Asian people for recovering the energy-material balance in our future world, where human population and energy consumption keep growing,



Ref. :[1] H. Koinuma and I. Takeuchi, Nature Materials, **3,** 429 (2004)
[2] H. Koinuma, McGRAW-Hill Yearbook of Science & Technology **2013,** 325-330