



Examples of Change Driver Descriptions

To support Horizons' cross-impact event with Future of Asia participants, groups were given change driver descriptions in four sub-domains: energy, economy, social and geostrategic. Below are the descriptions of the energy change drivers.

Future of Asia – Energy Change Drivers

1. Rise of alternatives – electricity

Driven by increased financial flows, policy targets, and technological innovation, alternative sources of electricity (e.g. solar, wind and hydro, depending on the area) are growing rapidly across Asia. Grids are better able to integrate renewables thanks to a host of adaptations (e.g. curtailment, demand response, storage), but alternatives can also be deployed in a decentralized way (e.g. solar, wind, modular nuclear, run-of-river hydro). Machine-to-machine communication over the internet of things and grid optimization are also increasing energy efficiency.

2. Rise of alternatives – fuels

While the overwhelming majority of energy used in transportation is derived from oil, a number of alternative ways to power transport are increasingly cost competitive and technically viable, including biofuels, natural gas, hydrogen and battery-powered electric vehicles. Synthetic biology also may hold additional promise for replacing jet and diesel fuels. Total biofuel production in Asia has grown more than fivefold since 2004, from 2 billion litres to almost 12 billion litres in 2008 (USAID, 2009), and electric vehicle sales are also increasing across Asia, with Japan and China in the lead.

3. Growing water scarcity

Asia has the lowest regional per capita water availability in the world (UN ESCAP, 2014), and demand is growing from competing uses: agriculture, electricity production (e.g. dams), water-intensive industries (e.g. apparel, high-tech/electronics, food and mining), sanitation, drinking water, bio-diversity, etc. Energy and water limit each other: from a water perspective, energy is needed at all stages of water extraction, treatment, and distribution (for agriculture, sanitation, etc.). From an energy perspective, water is required to convert resources into electricity (for coal, nuclear, hydro, etc.). Dwindling water tables and climate change-induced drought are expected to further exacerbate water scarcity.

4. Manufacturing is decentralizing

Additive manufacturing (3D printers) and synthetic biology (i.e. the design, re-design and construction of new biological entities) both provide an impetus toward distributed manufacturing. The distribution or de-centralization of manufacturing in light of these technologies has the potential to fundamentally re-structure value chains, materials use, recycling and energy production over the coming 15 years (e.g. abundant biofuels, low cost solar panels, lower demand for transport fuel, etc.).

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