Why wind energy?

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Wind energy has a relatively minor role in our current energy mix, but it can be one of the most important players in our future energy mix. Humans are extraordinarily effective at transferring carbon from the Earth to the atmosphere, mainly for the purpose of generating useful energy. This carbon-based energy choice has impacts on the Earth's climate, from the carbon cycle to air pollution, but also on other human factors, such as population growth and GDP. Most negative impacts can be eliminated by a green economy in which energy comes from renewable sources, such as wind. Wind will be evaluated in terms of its global potential, variability, effects on climate, and limitations. Preliminary findings also suggest that offshore wind farms can provide the additional benefit of protecting coastal communities during hurricanes.

Geochemistry and mineralogy of Philippine Nickel laterite deposits

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Increased worldwide demand for steel has led into exploitation of nickel coming from Nickel-enriched soils weathered from ultramafic ophiolites. The Philippines is the second largest producer of nickel laterites which are mostly fed into blast furnaces in China. We have conducted extensive mineralogical and geochemical studies on these laterites comprising: 1) XRD and Rietveld refinement to identify mineralogical phases of laterites, 2) sequential extraction studies to delineate phases wherein nickel is enriched preferentially and 3) major and trace element analyses of laterite stratigraphy. We find that iron oxides and hydroxides dominate the limonite phase, not clay minerals, the latter only occurring in the lower "saprolite" phases which are dominated by serpentine-type minerals. While olivine precursors dominate the peridotite bedrock of laterites, we notice that pyroxene-rich horizons give rise to higher-grade nickel laterites. Trace element analyses also reveal surprisingly enriched concentrations of some rare-earth elements and other elements (e.g, Sc, Ti,V) that are not included in payment credits for the ores.

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