**Ice Shields**

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Thickening sea ice can be a means of sequestering CO2, provided that the chilled, dense, and gas-rich brine left after most of seawater’s water content has been turned into ice is allowed to sink to the seabed.

Anchored Arctic wind turbines could provide renewable energy to power low-lift seawater pumps and other system requirements. In the freezing season, AI-controlled satellite pumping stations would optimise intermittent flows of seawater, first onto newly-formed sea ice, then onto each low-angle conical ice shield as it built up – rather like how lava can form a mountain. A frigid atmosphere causes forming ice crystals in the thinning, radial flow to attach themselves to the ice below. The chilling residual brine concentrates the dissolved carbon dioxide and oxygen (and may absorb more from the atmosphere), together with the salt from the seawater. Falling off the edge of each ice shield, the ‘brinefall’ would take its contents directly to the seabed where the CO2 can react with seabed carbonates to form benign, long-lasting, dissolved bicarbonate and the oxygenation succour marine life. Brinefalls on a wide scale would also reinvigorate the overturning currents that keep our oceans healthy. Ice shield arrayed polar regions would help return the climate to its previous benign state.

Over its life, a single, 2.5MW floating wind turbine might power the growth of up to 50, ~5km2 ice shields in a linked array that could be grown and grounded in water up to hundreds of metres deep. Designated channels and polynyas amongst the ice arrays would provide access and habitat for polar wildlife and shipping. Deep arrays would repel the intrusion of warm water into the Arctic Ocean, thereby reducing melt loss and glacial calving. Thermals derived from released ocean heat in the cold and dark seasons would take the heat directly by convection to the tropopause, whence it would radiate into space, unhindered by the insulating greenhouse gases below it, thereby cooling the planet. Increasing ice cover would reverse previous losses whilst the semi-permanent increase in ice cover would effectively reflect warm season sunlight by its high albedo. Spare, warm season wind power might be used to generate cooling marine cloud brightening, be taken to market by HVDC cable, or else be used to capture and process seabed emissions locally into no-drill natural gas, hydrogen, ammonia, nanocarbon products and vat protein, or also be used to generate iron salt aerosols (ISA) from sublimated ferric chloride that destroy polluting atmospheric methane, nitrous oxide, black carbon, ozone, CFCs and smog by photo-catalysis.