OPPORTUNITY #3

WHAT IF EVERY SURFACE COULD REMOVE CARBON?

BRICK BY BRICK – CARBON REMOVAL EVERYWHERE

Novel materials, coatings and genetically modified plants can remove carbon from the air and help cities become net zero or even carbon negative spaces

WHY IT MATTERS TODAY

The world needs to remove carbon dioxide (CO_2) from the atmosphere in order to offset remaining emissions and reach net zero by 2050,[15] limiting global warming to 2°C in order to avert the worst effects of climate change,[16] according to the Intergovernmental Panel on Climate Change (IPCC). To reach that goal, it is estimated that 2,500 large carbon capture and storage (CCS) plants are needed to take 3.75 billion tonnes of CO_2 out of the air by 2040,[17] dwarfing the current annual global capacity of about 40 million tonnes.[18]

Being carbon neutral (aka net zero) means removing an equal amount of CO_2 that has been emitted into the air. Being carbon negative means absorbing more than what has been emitted.[19] Carbon removal solutions can make a region or company carbon neutral if they offset an equal amount of emissions elsewhere or carbon negative if the CO_2 removed exceeds the continuing emissions.

SECTORS

ADVANCED MATERIALS & BIOTECHNOLOGY · AUTOMOTIVE, AEROSPACE & AVIATION · ENERGY, OIL & GAS · INFRASTRUCTURE & CONSTRUCTION

THE OPPORTUNITY TOMORROW

From bioplastic and wood to concrete and sand, researchers and companies around the world are developing materials[20] and genetically modified trees and plants[21] that can together help absorb carbon. Many of these advances in materials, smart surfaces and biomaterials are ready to be scaled across cities and communities in paving, paints and coatings. This could transform our surroundings into global-scale carbon capture and storage systems.

Scalable solutions for carbon capture in our environment can be combined with innovative regulations and building standards which drive the switch to alternative materials that take carbon out of the atmosphere so it can be used for other things. For example, by feeding captured carbon dioxide to algae it can be converted into biomass, which can then be harvested and turned into biofuel.

BENEFITS

Embedded, distributed carbon removal requires less capital and energy than large-scale carbon capture and storage initiatives. Walls, streets and buildings that capture carbon and/or are produced without a carbon footprint mean cities can become giant carbon sinks, significantly contributing to the goal of net-zero or even carbon negative emissions.

RISKS

Storing high volumes of CO_2 runs the risk of leaks or accidents which would contribute to localised ocean acidification or pollution.