

The Role of Hydrogen in Carbon Recycling Technology (CRT)

Why the colour of hydrogen does not matter—if emissions are closed in a loop

Much of today's hydrogen debate is framed around colours: green, blue, turquoise, grey. This framing, while politically convenient, is technically incomplete.

Hydrogen is not a primary energy source. It is an energy carrier—a way of transferring energy from one domain into another usable form.

In Carbon Recycling Technology (CRT), carbon atoms act as recyclable carriers, hydrogen provides the energy input, and the system is defined as a closed carbon loop.

What matters is not how hydrogen is labelled, but whether carbon entering the system is fully accounted for and carbon leaving the system is fully recovered and recycled.

Once system boundaries are correctly defined, the hydrogen colour debate collapses. Closed-loop carbon systems fundamentally change emissions accounting.

Hydrogen's true role in CRT is threefold: as a reductant, as an enabler of long-duration energy storage, and as a stabiliser allowing renewable electricity to be delivered as dispatchable baseload power.

Instead of asking whether hydrogen is green or blue, the correct engineering question is whether the carbon loop is closed, measured, and enforced.

In a properly defined system, carbon is not the problem. Leakage is. Close the loop, and the debate ends.