Building Integrated Carbon Storage

Building-integrated carbon capturing (BICC) represents a new approach to existing carbon capture technology called Moisture Swing Air Capture Technology, by attempting to integrate this carbon-capturing technology onto building facades (Bryan & ben Salamah, 2018). Being such a new system, it is very much still in the research and study phase. This process creates a way in which we can take the carbon from the air and store it.

Removing CO2 ­from the air has been done for a while, however this is a hole new way of doing it by using the surfaces of building structures and other technologies with the buildings infrastructure to increase the capability of the process. The process of doing this in buildings rather than in CO2 dense exhaust gasses is much harder. Ambient air and natural air speeds make this a difficult task. So far there are two ways that have been developed to do this process.

A company called Climeworks, has produced a commercial carbon removal technology. They way that their technology works is that they flow air into a device through a fan, this air then passes over or through a sorbent material filter that absorbs the CO2. This is then heated up allowing thee carbon to be released, and from here the carbon can be collected to be stored in tanks.



Climeworks: the CO2 capture and release process (source: Climeworks)( Bryan & ben Salamah, 2018).

The other technology that has been developed that could work is a technology developed by Dr. Klaus Lackner. Dr. Lackner defines air capture technology in his 2009 article “Capture of Carbon Dioxide from Ambient Air” [6] as follows: *“A passive, sorbent-based air collector can be viewed as a large filter standing in an airflow with the filter surfaces covered with or made from a CO2 selective sorbent. Air that comes in contact with sorbent surfaces will relinquish some or all of its CO2. The larger the surface area and the longer the contact time, the more CO2 is removed from the air”* (Bryan & ben Salamah, 2018). The difference between the technologies is that the Moisture Swing Air Capture Technology uses water to remove the carbon and the air is not forced by a fan.



Moisture Swing Air Capture Technology: the CO2 capture and release process (source: Sara Weber, Brooke Stobbe and Ty Scholes/Cronkite News) (Bryan & ben Salamah, 2018).

Through these technologies, the construction sector could have an option of working well to not just have buildings with materials that have carbon stored in them, we could be collecting it from the air actively. This could completely change some of the pressures on climate change. Using these technologies and removing carbon from the air, this would have a positive effect on ecologies, the climate and culturally. If we can be positively impacting ecologies through creating more oxygen rich air and putting the CO2 to use, we could see struggling ecologies, start to revive and rejuvenate. These ecologies largely have effects on cultural systems around the world. Different cultures have relied on ecologies for food and living for years. We have seen that with how the climate has been and with declining ecologies and species of animals, insects, plants etc, there have been massive implications to culture. If this was to be fixed, then we wouldn’t see these issues. When we talk about climate, almost every time we talk about the CO2 that is being pumped into the air. Through these technologies and removing some of this from the air, we could see a big shift in the rate of climate change. There are so many things that need to be done, but this could be one little step that could help make a change.

References

Bryan, H., & ben Salamah, F. (2018). Building-integrated Carbon Capture: Development of an Appropriate and Applicable Building-integrated System for Carbon Capture and Shade. *Civil Engineering and Architecture*, *6*(3), 155–163. https://doi.org/10.13189/cea.2018.060305