



e5

European Business Council
for Sustainable Energy
and Materials



**UN CLIMATE
CHANGE
CONFERENCE
UK 2021**
IN PARTNERSHIP WITH ITALY

Focussing on Clean Building Materials

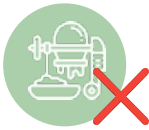
31 OCT - 12 NOV 2021
GLASGOW



necessities to reach 1.5°



Out of fossil energy (coal, oil and gas) **TODAY**



Out of fossil building materials (lime stone based cement) **TODAY**

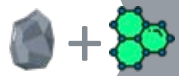


Into **100%** renewable energy (water, wind and PV) **TODAY**



Into **100%** NET materials (wood, carbon fiber and hard stone) **TODAY**

Negative Emissions Technology - NET



Combination of carbon fiber and natural stone



Natural stone is a light weight material, like aluminium, same gravity



Carbon fiber (CF) can be made out of CO₂



Synthetical process $H_2 + CO_2 \rightarrow$ Methanol (Fischer Tropsch Synthesis, FTS) \rightarrow PAN based CF



Biological process is even more efficient \rightarrow through algae oil \rightarrow PAN based CF

I-Beam from Carbon Fiber and Granite CFS - CarbonFiberStone



Benefits of CFS - CarbonFiberStone



LIGHTWEIGHT

CFS-CarbonFiberStone is lighter than aluminum



ENERGY EFFICIENCY

Higher energy efficiency than steel and concrete




LONGEVITY

Much higher longevity compared to other building material




IMPACT ON NATURE

And its mining, winning and treatment has much less impact to nature



NET CARBON SINK

In case the carbon fiber is made from ambient air CO₂ it is carbon negative and serves as a net carbon sink



ADDITIONAL CARBON SINK EFFECTS

The stone waste in form of stone powder is a significant additional sink of CO₂



Green Carbon Project

Project funding from German Ministry of Research with 7 Mio Euros:

- ✓ Carbon fiber and jet fuel from algal oil
- ✓ Algae is fed with CO₂
- ✓ Algae-Tech Center at AIRBUS near Munich
- ✓ Carbon fibers from algae with same properties like those being used by AIRBUS today from crude oil
- ✓ Combination of CF with stone → CFS



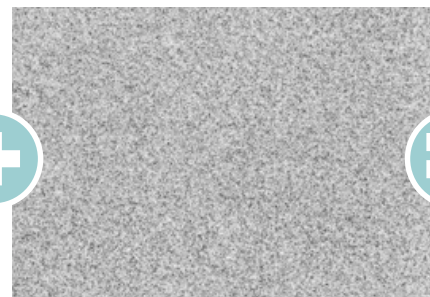
Scalable CarbonDioxideRemoval (CRD) with Building Materials as net carbon sink.



ALGAE OIL



CARBON FIBER



STONE SLICE



HOUSE WALL

Green Carbon Prototypes



House wall element made from
Swiss granite and CF

- ✓ 4 x lighter than same wall from concrete
- ✓ 4 x higher longevity
- ✓ 2 x thinner
- ✓ 2 x less production energy

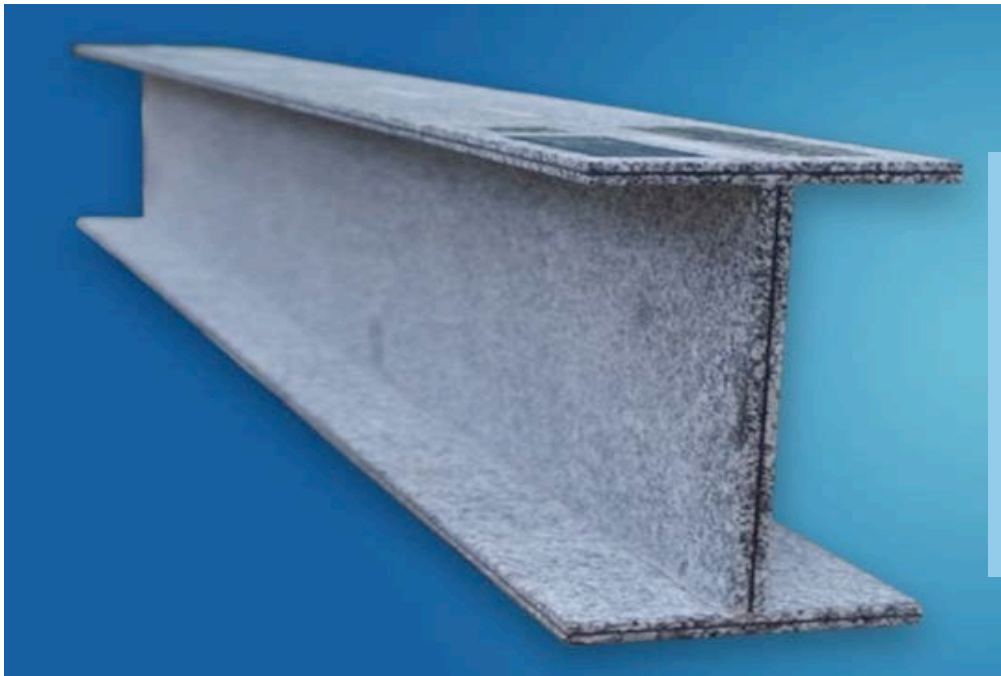
Green Carbon Prototypes



I-Beam made from Bavarian Granite and CF

- ✓ 2 x lighter than same from steel
- ✓ 4 x higher longevity, non-rusting
- ✓ 2 x less production energy

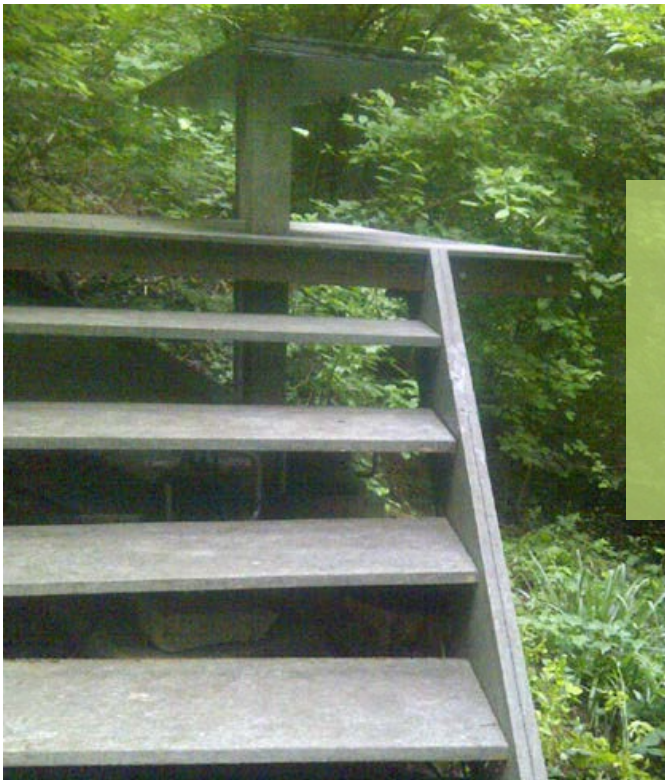
Green Carbon Prototypes



**I-Beam made from Bavarian Granite
and CF**

Carbon fiber is protected by stone layers

Green Carbon Prototypes



Self-supporting stairways made
from Swiss Granite and CF



Green Carbon Prototypes



Pillar as support for light weight self-supporting Terrace made from African Granite and CF

The carbon fiber layers are protected by stone layers outside, CF is not visible



Renewable Energy & NET

**Can meet the 1.5°C
if implementation starts TODAY**



**THANK YOU
VERY MUCH**