



## **carbonfuture.earth: A focus on user and planet**

Your CO<sub>2</sub> footprint! Greenhouse gases! Climate change! These topics are omnipresent in our daily life and people are very conscious about reducing their CO<sub>2</sub> footprint and compensating for their CO<sub>2</sub> usage. But the reduction is not enough. Additional removal of atmospheric carbon is paramount. We must actively remove CO<sub>2</sub> from the atmosphere and store it sustainably to contain global warming. But how should we do this? And what is the contribution of Karakun?

# case STUDY

The German startup company carbonfuture GmbH aims at removing CO<sub>2</sub> from the atmosphere, in particular at the storage of CO<sub>2</sub> using so-called carbon sinks. In the first step, carbonfuture focuses on bio-char, which is also known for its positive effect on soil. Also, the CO<sub>2</sub> storage capacity is quantifiable, and its supply chain is easy to track. All these features are at the heart of the carbonfuture platform that brings together bio-char producers, farmers who are using bio-char as fertilizer, and individuals that want to compensate for their CO<sub>2</sub> usage. The concept is to monetize the effects of carbon sinks and to establish a trustworthy and reliable trading platform with a focus on security and traceability.

In this project, Karakun as a technology partner for carbonfuture addressed three major challenges.

## Challenge No.1: „Hello? Anybody out there?“

Typically, we start a project from the user perspective and find out who uses the product, how this person is using it, and where the main challenges lie. In this case, it was different: because the platform addresses a new service, there was no experience to rely on, no users to talk to, no competitor platform to evaluate.

We started with a characterization of the potential users by talking to the carbonfuture team. Based on their assumptions and the research we identified and described several main personas. For example the manager of a bio-char trading company who is passionate about his work but not keen on computer work. Therefore he wants the application to be straightforward and intuitive. Or the family man who is very eco-conscious and wants to use the carbonfuture platform to contribute to CO<sub>2</sub> reduction in a quick-and-easy way.

With these personas in mind, we defined and designed the look and feel of the application. First, we used a tool to define the strategic direction of the design: a 2x2 matrix also known as a mood board. This model helped us to visually illustrate the style we wanted to pursue. Additionally, we used some wireframes illustrating the roles and functional areas of the application created by the carbonfuture team to describe their initial showcase.

After an analysis of the intended functionality behind the wireframes, we started to apply UX design principles. For each wireframe we answered the following key questions:

- What does the user want to achieve on this particular screen?
- What is the user's main task?
- How can we support the user in completing this task?

The initial wireframes were focused on the pure functionality and on the data to be displayed. We rearranged the input fields and table views to accommodate the user's tasks and placed them in reading direction. This approach ensures a natural flow of information. Other issues were the navigation structure of the fast-growing application, the optimization of the many forms users need to complete and of course to eliminate complexity.

## Challenge No.2: “High Five! And mobile, please!“

Five different user roles are working with the platform; these roles are

- the Sink Producer who produces the sink's basic materials
- the Sink Registrar who creates the sink by carbon preservice application of the products
- the Certifier who assesses correctness and efficiency of the sinks and issues the carbonfuture certificates
- the Broker who trades the certificates and bundles them into portfolios
- the Balancer who manages his CO<sub>2</sub> footprint.

A user can take on multiple roles. As each role is very unique with special tasks and views, we decided to separate them in the system. The user has to actively switch roles to adopt a different one.

The roles within carbonfuture consist mainly of field experts who are not necessarily computer experts. The Balancer is the only “mainstream” role, which may be taken on by anybody. This role is therefore quite hard to grasp - in particular as both individuals and corporates will take on that role. We assume that such a user is not familiar with table views but prefers a lightweight, fun-to-use interface with state-of-the-art look and feel. To make this challenge even more fun, let’s add the mobile component to it so that the application can be used anywhere, anytime.



### Challenge No.3: “Dressed to Kill“

carbonfuture is out to become the best in class of the carbon sink economy. Thus, the appearance must be innovative, trustworthy, reliable but also young and fresh.

There was no Corporate Design yet; therefore, we picked colors from the carbonfuture logo and developed design elements based on the persona derived mood board. As the starting point for every user and role is the carbonfuture website, we decided to keep the look of application and website as close as possible.

The application uses a lot of white space, high contrast fonts, and a black header bar to appear clean and ordered. The tables look easy and lightweight due to lots of space around the items; redundant lines and separators have been avoided. All these design decisions result in a serious and reliable look.

To make the application appear young, innovative, and fresh we also dressed some elements more playfully. We modified the navigation items by using capital letters which we underlined in one of the primary colors. The table view and the detail view now seem to float on the background. They are still close enough to be associated with each other but exhibit an airy feel.

The Balancer view differs from the other roles as meaningful photographs accompany the presented portfolios. Plus, we opted for tiles instead of table rows to accommodate for the differences in expectations and experience of this role. We want the Balancer to stay with the application, feel at home, and at ease and encourage him with our design to actively engage with the application.

For the mobile view, we collapsed the tables in the expert roles and minimized the tiles for the Balancer. Instead of table rows, we use tiles with data; detail views are shown on click by opening a second “page”. All the other design elements stayed consistent.

Our time frame for all this was extremely short. In only two months, an agile team composed of one developer, one designer, and 3 people on the customer side developed a nice looking, intuitive application for all defined roles. Something we can be proud of. Not only for the users of carbonfuture.earth but also for the future of our planet.

## About carbonfuture

Early 2019, Hans-Peter Schmidt from the ithaka institute and Hansjörg Lerchenmüller from Carbuna AG shared their thoughts to address the shortcomings of existing carbon offset markets with us. From an abstract scientific perspective, Hans-Peter's groundbreaking idea of carbon sink leasing inspired us immediately. We started to think about a scalable framework for carbon sink financing as the backbone of a re-thought economy in which the fight against global warming is rewarded properly.

In summer 2019, we presented the academic results complemented by a proof of concept blockchain-based implementation on the IBI study tour in Finland, and some weeks later on the symposium of the German Fachverband Pflanzenkohle. The concept turned out to be so convincing that we decided to take it seriously. We then started implementing the framework front to back in close collaboration with pioneering people from the young bio-char sector, from finance, academia, IT and corporates willing to balance their emissions. As of January 2020, we have created the first fully documented and verified bio-char-based carbon sinks which fulfills the quality criteria needed to become a commercially viable financing instrument.

## About Karakun AG

Karakun AG was founded in 2018 and has a total of 50 employees in Switzerland, Germany and India. Our core competency is the agile development of individual software for companies and organizations with Java platforms and web technologies. Our main focus is to provide users with applications which support their daily work and are fun to use.

Our passion extends to consulting and educating our customers in which technology to select and how to improve their software development. Among our consultants and trainers are Java Champions, JavaOne Rockstars as well as book authors.

