EUROPEAN UNION

European Regional Development Fund

Senate Department for Economics, Energy and Public Enterprises

Berlin

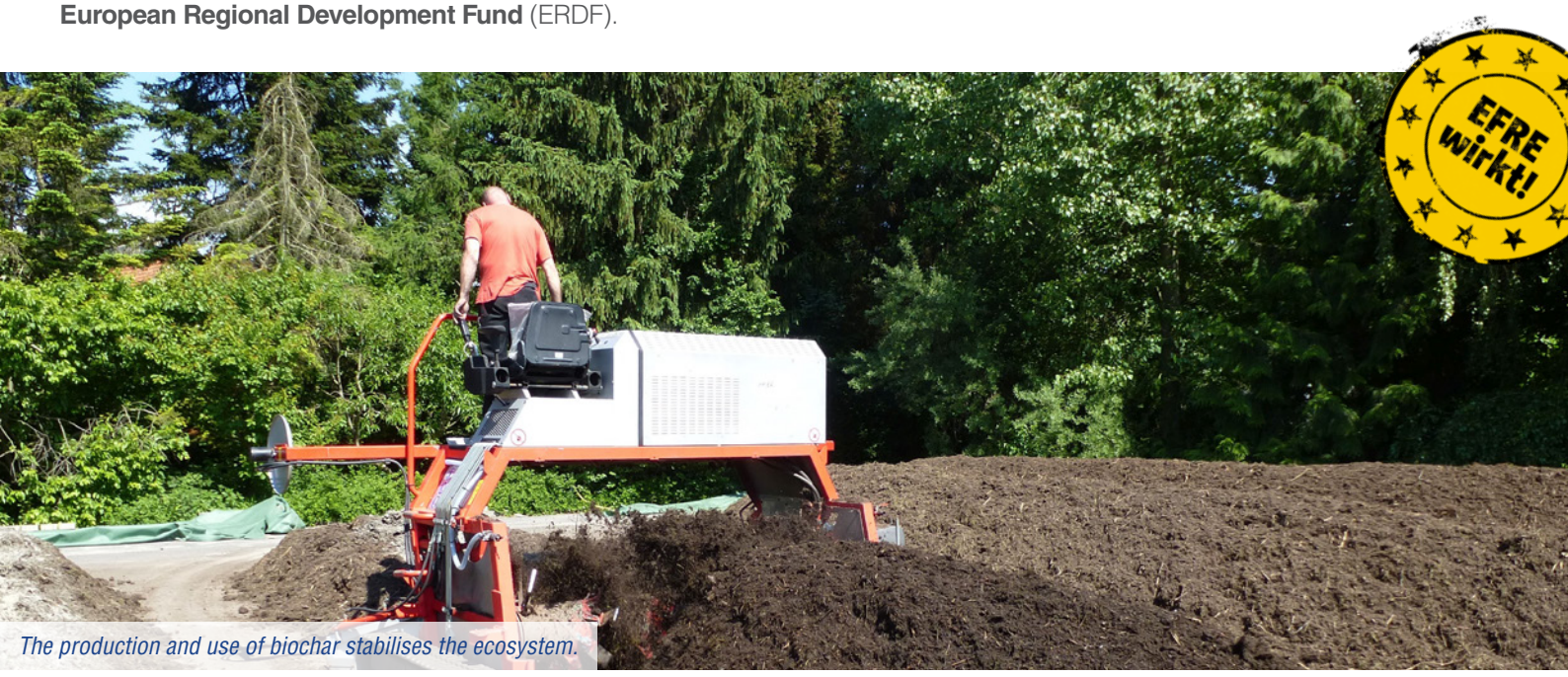
PROTECT THE ENVIRONMENT BY USING BIOCHAR

BIOCHAR REDUCES ORGANIC WASTE, MAKES SOIL MORE FERTILE, REDUCES ANIMAL SMELLS AND ABSORBS CARBON DIOXIDE – a true ecological multi-talent. This is what Professor Terytze's research team at the Faculty for Geosciences at the Freie Universität Berlin has discovered. In 2012, the team installed a pyrolysis unit at the Botanical Garden. In this unit, organic plant-based waste is processed to biochar, which in turn is analysed with regard to its environmental potential. Artificially accelerated, the unit imitates the natural degradation process during which, over thousands of years, the carbon dioxide accumulated in organic plant-based waste is absorbed. The biochar produced in this way is in turn put back into the ecosystem, so that the environmental cycle remains complete. In the process, part of the carbon dioxide does, however, remain in the biochar. The effect: the CO_2 content in the atmosphere is reduced in the long run. What started in the Botanical Garden six years ago with the preceding project *TerraBoGa*, is now adapted and developed further under the *CarboTIP* project for the Tierpark Berlin-Friedrichsfelde.

»WE RECEIVE CALLS FROM PRIVATE INDIVIDUALS, MAKING ENQUIRIES OR EVEN WANTING TO PURCHASE BIOCHAR FROM US. THIS IS OF COURSE NOT POSSIBLE, WE DO NOT SELL BIOCHAR, BUT PUBLIC INTEREST IS APPARENTLY ALREADY HIGH.«

Prof. Dr. Dr. Konstantin Terytze, *Project Manager of Carbo TIP*

SEVEN RESEARCH ASSISTANTS OF THE FREIE UNIVERSITÄT BERLIN, in collaboration with the Botanical Garden as well as Tierpark Berlin, are establishing which waste products can be processed into biochar, under which conditions this can be best achieved and how the end product, biochar, can be used. As the closed ecological cycle is always viewed within a system, research results from the Botanical Garden cannot be directly applied to the location Tierpark. It is, however, already known that biochar, as long-term depository of essential nutrients, stabilises and sustainably fertilises the ecosystem. *CarboTIP* therefore serves to reduce CO_2 emissions: In the 160-hectare Tierpark Berlin, about 8,000 m^3 droppings, 155 m^3 wood, 72 m^3 green cuttings and around 16,000 m^3 leaves accumulate. Added up, this corresponds to a volume of approximately 8 Olympic swimming pools. With this mass of waste products, the zoo provides the research project with an excellent location and can save 190 tons of CO_2 per year thanks to it. In Germany, this saving corresponds to an average of CO_2emissions of circa 202 adults. *CarboTIP* is therefore funded under the **Berlin Programme for Sustainable Development** (BENE Klima), namely in equal shares by the Berlin Senate and the **European Regional Development Fund** (ERDF).



The production and use of biochar stabilises the ecosystem.

CarboTIP

NUMEROUS APPLICATIONS FOR BIOCHAR

A primary objective of the *CarboTIP* research project is the continuing assessment of the procedure for its effectiveness. It is thus determined under what circumstances an own pyrolysis unit would make sense for the zoo. In addition, the research project can establish further **opportunities for the use of biochar**. After all, the research results can be applied in the most diverse areas of life, from personal gardening via economical agriculture and animal husbandry to the development of urban infrastructure. In specific terms, the potential of biochar as a fertiliser in agriculture, for the reduction of waste and CO_2 emissions and as a heat source, is identified through the research results. Due to its high content of nutrients, biochar makes not only mineral fertilisers, but also the **use of peat redundant**, which provides only short-term soil improvement. Beneficial effects have also been found in relation to animal husbandry: Biochar absorbs **unpleasant smells** and can reduce the **use of pharmaceutical products** for livestock.

THANKS TO ERDF, IT WAS POSSIBLE TO CARRY OUT RESEARCH ON THE POTENTIAL OF BIOCHAR FOR THE ZOO

Biochar demonstrates beneficial effects for the environment in every respect: It is not only during its production, that carbon dioxide from waste products is sustainably stored. Biochar itself also has numerous benefits, which can be transferred to many systems if used accordingly - and always **use-oriented** and **appropriate for the location**. Research is currently being carried out on the **carbonisation of foliage**, so that in a couple of years, perhaps autumn will bring with it biochar instead of dead leaves to be disposed of.

ERDF IS EFFECTIVE IN BERLIN

More than 35,000 tons of CO_2 emissions can be saved per year due to the **Berlin Programme for Sustainable Development** (BENE Klima) supported by ERDF. BENE Klima promotes measures, projects and initiatives, which are contributing to a climate-neutral and environmentally friendly Berlin. Support is provided for **energy savings** in businesses as well as for investments for energy saving and **the use of renewable energies** in public infrastructures and buildings. Further key areas are the **improvement of local public transport** as well as transport by bike and on foot, and **the research and development** of low-carbon technologies, as well as environment and energy management systems. The objective of the BENE programme is a sustainable **reduction of CO_2 emissions** in the commercial and public sector, to reconcile economic growth and the conservation of resources.

In concrete terms, the ERDF is ensuring that ...

- less carbon dioxide reaches the atmosphere, but is sensibly stored in biochar.
- the ecosystem and its natural cycle is supported.
- harmful substances in fertilisers and pharmaceutical products in animal husbandry can be dispensed of.
- a sustainable solution for organic waste becomes established.

The natural cycle for the production of biochar

Leaves become valuable biochar

Alleged waste ensures a better climate

FUNDING:

FUNDING PRIORITY 3

Reduction of CO_2 emissions BENE Klima

FUNDING AMOUNT

€ 916,648, 50% ERDF

PROJECT TERM

07.12.2016 - 31.01.2020

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Editing and design:
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