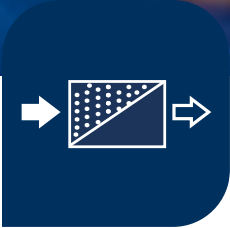
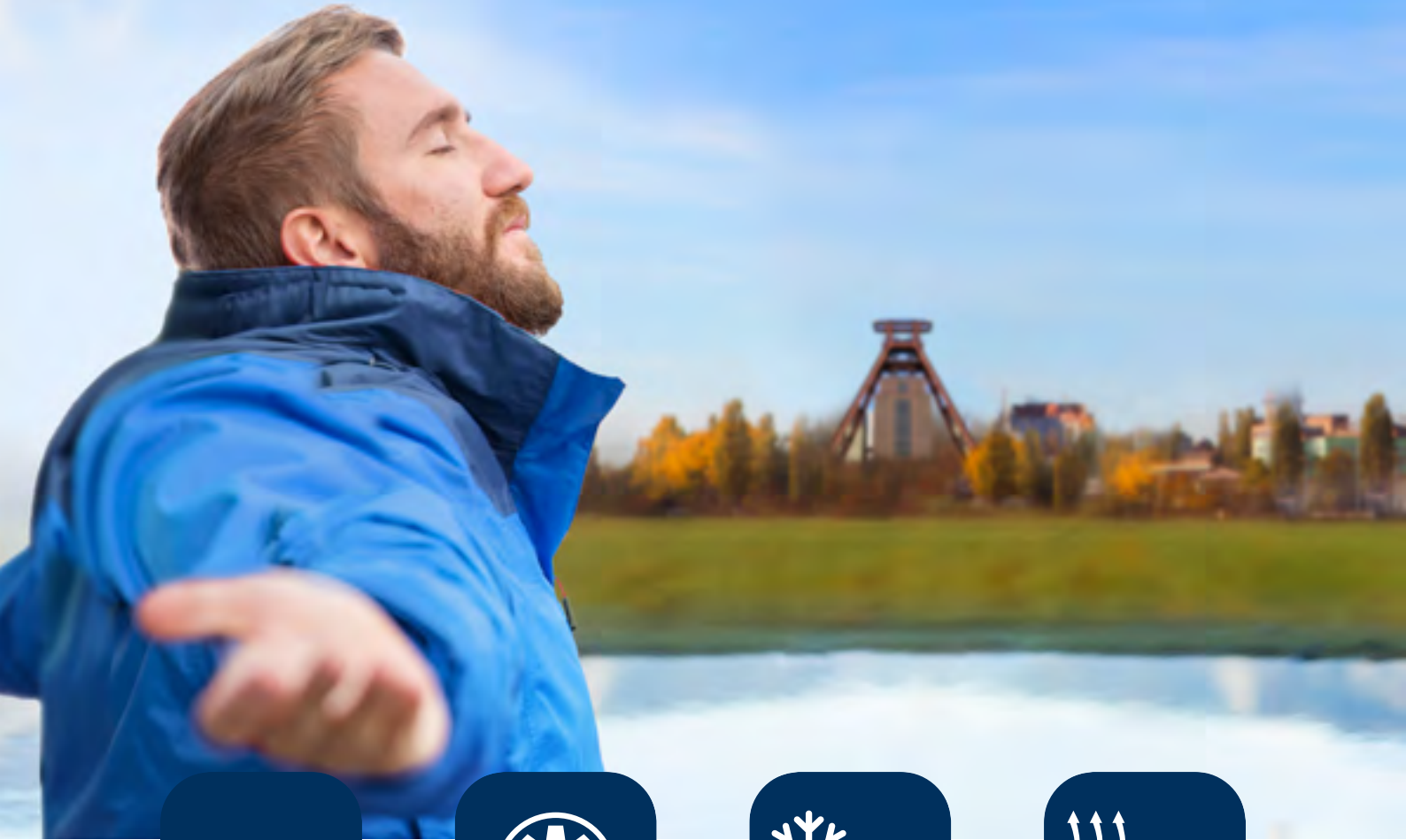


compactfiltertechnik

# BREATHE THE DIFFERENCE



Dedusting



Ventilation



Air cooling systems



Air heating systems



## CFT – A PILLAR OF THE CFH GROUP

### Clean air is our mission

Through our many years of experience and the close relationship with our customers, we have an excellent understanding of the processes in mining and tunnelling. We know how strenuous the tasks are that underground personnel have to perform and we know how extreme the conditions can be that man and machine are subjected to. Our contribution is to make these tasks more acceptable and healthier. Moreover, our technology is designed to ensure compliance with all national and international legal limits for inhalable and respirable dust.

Air –its cleaning, provision, heating, cooling and moving – is our mission. In this respect we are able to support our customers with our wealth of knowledge, gathered over decades, with technical expertise and innovative strength. Now – and in future.

Tomorrow's greatest challenges will be mobility and energy. As the global economies grow and populations expand, so the numbers of passengers and goods will also increase constantly. Thus the traffic infrastructures of the future will also have to be designed increasingly for underground operations. Furthermore, the future demand for raw materials will also continue to increase. The underground mining of raw materials forms the basis for rapidly increasing wealth and for industrial added value worldwide. This means that in the future an increase in the extraction of raw materials can also be expected.

We at CFT will be glad to take on these international challenges for you! Regardless of the depth to which you need our expertise or under what climatic conditions – we ensure that you and your employees enjoy the best possible air conditions at the workplace. To this end we are at your disposal with durable and sustainable dedusting and ventilation systems as well as systems for heating and cooling the air. All CFT solutions are made in Germany and designed to protect the environment and preserve resources – and that includes complex turnkey solutions and complete package systems.

We have already set our course for the future – with the forthcoming construction of our new factory we will ensure that our capacities are able to keep pace with the growth of our company in the years to come. In particular, this also allows to create a suitable working environment to meet the needs of the increasingly complex plant engineering sector.

Together with you we want to look to the future and be a fair and dedicated partner for you in every respect.

With a hearty „Glückauf“ (traditional German miner's greeting)!

Your team of experts from CFT GmbH Compact Filter Technic

# CONTENTS



6

**4** **Intended for customer satisfaction**  
Innovative solution provider with experience:  
**CFT GmbH Compact Filter Technic**

**6** **Designed for cleaning efficiencies of almost 100 %**  
Best results irrespective of the dust concentration:  
**CFT Dry Dedusters**

**8** **Tailored for compactness and cost-effectiveness**  
Ideal for working with sprayed concrete or in hard coal:  
**CFT Wet Scrubbers**



8



10

**9** **Suitable for the complete collection of cuttings**  
Enable drilling without water:  
**CFT CTBA Dry Cuttings Extraction Systems**

**10** **Designed for underground use**  
Indispensable for the supply of air in mining and tunnelling:  
**axial fans and accessories**

**12** **Trailblazing package options**  
Adaptable to conditions above and below ground:  
**mine air cooling systems**

**14** **For heating air under extreme conditions**  
Powered by electricity, gas or hot water:  
**mine air heating systems**

**15** **Focused on enhanced workplace safety and productivity**  
Innovative solutions for capturing methane gas:  
**methane drainage systems**

**16** **Orientated to the project timeline**  
Fresh air just-in-time:  
**CFT services for tunnel refurbishment**



12



14



9

**19** **Aimed at adding value for our customers**  
For long-term protection of capital investments:  
**CFT Services**

**20** **Created for the optimum networking of skills**  
Bringing together the global activities in the „clean air“ sector:  
**CFH Group**



16

## System solutions for the highest standards: CFT GmbH Compact Filter Technic



CFT is a future-oriented, internationally aligned, family-owned company. We have been supporting our customers since 1999 as a competent solution provider with a range of ventilation products for occupational health and safety and the protection of the environment.

With our well-versed and qualified employees, we develop bespoke systems and complete concepts that are precisely and flexibly tailored to your individual requirements. As our customer, you benefit from our sound experience in complex projects and in the coordination and integration into existing plants, situations and systems.

One of our innovative solutions is the option of „smart“ control of the systems. Our modern CFT Smart Filter online control system enables a direct reaction to changes. Data can be accessed at any time, problems detected at an early stage and operating times optimised. Online and from wherever you like.

With our many years of experience, we continually strive to develop our expertise. That means always orientating ourselves to the optimum solution for our customers. Our own high standards require that we design and supply high-quality, safe and cost-effective products and services.

»With every new task we take on the challenges that the project brings. That's what makes us different. That way we can guarantee to meet our customers' tight schedules and ensure that we act optimally in the interests of the project.«

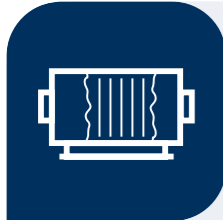
Markus Thomeczek, member of the Executive Board

In so doing, we offer our customers flexible and attractive options – not only in the purchase of a CFT system, but also in the area of rentals, leasing and finance.

### CFT – certainly the right decision

All CFT products are available in explosion-proof versions. We also hold many international certificates of conformity, including for China, Russia, Kazakhstan, the Ukraine, Europe and the USA.





Achieve cleaning efficiencies of virtually 100 %, irrespective of the dust concentration: our dry dedusters

CFT dry dedusters are used wherever the air quality standards are highest – that's why they are predestined for use when working in extreme conditions such as with hard rock for example. Levels of residual dust contents of less than 0.05 mg/m<sup>3</sup> are achieved on the clean gas side regardless of the dust content on the dirty gas side. Our product offering also includes a range of filter materials for the separation of special types of dust such as quartz, diesel particulates, asbestos and metallic dusts or even for HEPA13.

We have designed, manufactured and delivered more than 3,000 turnkey dedusting systems. Our long-lasting dry dedusters guarantee compliance with all applicable national and international workplace exposure limits, e.g.

for inhalable and respirable dust. We offer both compact sizes and flexible add-ons to suit your specific project. We also have considerable experience in the retrofitting of our equipment into existing systems.



### Your benefits at a glance:

- cleaning efficiency rates greater than 99.99 % with durable rigid filter elements
- optimised air and dust distribution within the filter chamber due to segregation of dirty and clean air channels
- minimum space requirements due to compact design
- low maintenance and all from the clean gas side
- low power consumption thanks to minimum resistance
- low compressed air consumption due to efficient cleaning system
- approved explosion-proof or flame-proof versions available
- smart dust discharge systems, including patented dust/water mixing units
- outstanding energy efficiency

### Applications:

- for all processes in underground mining: in development, production, raw materials handling and processing and the supply of building and stowing materials
- for all types of tunnel excavation
- In the refurbishment of tunnels especially for rail and road
- for integration into existing machines, e.g. roadheaders, TBMs, surface miners, continuous miners, bolter miners, etc.

### Individual test certificates for your system

We are committed to the quality of our products in every respect. On request, every CFT filtration system – dry, wet or dry cuttings extraction – can be tested by an independent institute and individual certificates issued to verify both the cleaning and overall efficiency.



## For maximum efficiency in the most confined spaces: our wet scrubbers

CFT wet scrubbers have proven their capabilities in dealing with the most challenging conditions for breathable air, for example in coal mining or in operations using sprayed concrete. They also have a worldwide reputation for reliability in special applications.

Cleaning efficiencies of up to 99.5 % are achieved at relatively low investment costs. Even more convincing, our wet scrubbers can be easily integrated into existing technical systems thanks to their compact design. A further advantage is the low operating cost as a result of targeted reduction of the consumption of resources such as power and water.

### Applications:

- in particular for moist and wet operating conditions
- preferably with inert dusts
- for integration into existing machines, e.g. roadheaders, TBMs, surface miners, continuous miners, bolter miners, etc.
- for sprayed concrete work
- for process plants, e.g. belt transfer stations



## Guarantees virtually complete collection of cuttings: our high-performance CTBA

Both rotary and percussive drilling machines normally use water to flush out the cuttings during operation. The disadvantages of this procedure are well-known:

- the high water consumption creates muddy floor conditions in the face area
- the slurry from the drilling leads to increased wear to the drilling machine itself
- when drilling overhead, the slurry leads to extremely poor working conditions for the operators
- under some geological conditions the water causes the ground to swell, thereby endangering the integrity of the roof support.

Sometimes drilling takes place in areas where the climatic conditions prevent the use of water – for example at temperatures below freezing or in arid regions.

To avoid these disadvantages, we have developed our innovative dry cuttings extraction system: the CTBA.

The heart of this innovative and patented solution is the combination of a highly efficient rotary piston blower with a compact high-performance dry deduster. No dust escapes to the atmosphere because the cuttings which are blown out of the hole are captured and removed by the filter. Our dry cuttings extraction systems guarantee almost complete entrainment of the cuttings – and thus decisive advantages with regard to occupational health and safety as well as efficiency.

»Our CTBA makes drilling without water possible. Thus, we make a significant contribution to the simplification of the drilling processes and, where applicable, to an improvement in the integrity of the roof support in mining and tunnelling.«

Mike Brill, Project Manager





## Provide for fresh air above and below ground at all times: fans and accessories

One of our core areas of activity is the primary ventilation of underground mines. Our main mine fans operate above and below ground as single and multiple units in series or as a block. We create intelligent bespoke solutions, tailored to the respective project requirements and for the energy-efficient operation. For example, our main mine fan stations are characterised by mechanical blade adjustment during operation and the use of variable frequency drives.

» Our customers' projects are highly complex. That's why we at CFT specialise more and more in tailored package solutions. That way we can call on a versatile range and offer system solutions for every requirement. «

Dr. Reinhold Both, Managing Director

Furthermore, we are able to provide our customers with a range of accessories such as shut-off valves and duct connecting and transition elements.



When it comes to auxiliary fans, we can also call on decades of experience. Since 2001, we have built and supplied more than 2,000 Korfmann fans for main and secondary ventilation in mining and tunnelling – from project planning to delivery. However, the experience of the CFH associate company stretches much further back: Before CFH became a shareholder in the newly-formed company Korfmann Lufttechnik GmbH in 2001, the predecessor, Maschinenfabrik Korfmann, had already placed more than 30,000 systems in mining and tunnelling applications during a company history of more than 120 years.

For tunnelling applications, we also supply portal fans – if necessary with variable frequency drives – as well as booster fans and flushing fans that increase the air speed or pressure in the duct or tunnel cross-section.

Every fan is thoroughly tested at our in-house fan testing facilities before delivery. Certificates of conformity to national and international mining and tunnelling standards are available.



### A multitude of applications for axial fans:

- main mine fans
- portal fans
- booster fans
- fans as part of a dedusting system
- auxiliary fans
- flushing fans
- fans for cooling and heating systems



## Offering modular combination options: our mine air cooling solutions

Climate control in the form of mine air cooling is fundamental in mining, tunnelling and other civil engineering applications. The mine air temperature here may not exceed the prescribed limit. The real challenge is not to „destroy“ the excess heat but to transport it elsewhere.

CFT has firmly established itself on the market as an innovative solution provider for this field of applications. We design and supply complete mine air cooling systems together with WAT Wärme-Austausch-Technik GmbH, a company in which CFH holds an equity stake. Depending on the application, we can offer our customers either centralised or decentralised cooling systems. Cooling capacities of up to 4 MW are available with individual systems and over 30 MW per project with complete installations.



» Protection of the environment is important to us – and not just within our own production chain. When designing our systems, we always pay attention to potential energy saving measures and the resulting reduction of our customer's operating costs. «

Jürgen Waller, Mitglied der Geschäftsleitung

Decentralised systems are designed for local use, for example directly on a tunnel boring machine (TBM). On the TBM the cooling system can be used for the cooling water of the TBM as well as for cooling of the air. Centralised systems are mainly used for cooling a complete mine or a larger area with a network of pipes connecting the individual system components for refrigeration, air cooling and re-cooling. Our systems can be adapted for underground and surface installation through modular combination options.



## Overview of air cooling systems:

### Refrigeration systems for mining and tunnelling

#### Water chillers

- central cooling system with indirect evaporation
- injection evaporators and high-pressure condensers

#### Compact water chillers

- local cooling system with indirect evaporation

#### Air coolers

- local cooling with direct evaporation
- air cooling without additional water circulation

### Air/water heat exchangers for mining and tunnelling

#### Air coolers

- spot coolers (variable design)
- face coolers (smallest design)

#### Recoolers

- alternative recooling, especially underground

The CFT portfolio also includes high-pressure/low-pressure heat exchangers for underground, recooling plants (e.g. cooling towers) and special solutions such as pumping stations and refrigeration systems for surface installation (e.g. air-cooled water chillers). All the equipment is also available in containerised design.

In addition to our well-established solutions for air cooling, we are also developing new and innovative air conditioning concepts. One such product is currently being developed that relies only on compressed air – without cooling water or electric drives. This will be suitable for cooling air at a low capacity, for example for the air conditioning of the driver's cab of a roadheader in a hazardous area requiring explosion-proofing.



### Engineering services for mine air cooling

Climate forecast calculation, specification of air cooling systems, cooling water and refrigeration systems, project engineering for the cooling system and PLC programming – we take care of all the engineering for you.





## In action to provide comfortable temperatures under extreme conditions: our mine air heating systems

Often, extreme temperature conditions can hinder the supply of fresh air considerably. That is especially the case in mining. The climatic conditions at the face and the local regulations commonly necessitate raising the temperature of the air entering the mine via the shaft by way of an air heating system. The temperature of the incoming air must not drop below 2 degrees Celsius.

Here, CFT mine air heating systems do a very good job. Heating capacities of up to 3 MW can be achieved with individual systems and over 30 MW per project with complete installations. The core of the concept is a mine

air heating system supplied by our partner Egger Apparatebau e.K. CFT has the exclusive marketing rights for these system components for the mining and tunnelling industries.

Normally our mine air heating systems comprise one or more banks of heating coils together with the appropriate fan stations. The energy for the heating coils can be provided by electricity, gas or hot water. Depending on the application and air flow requirements, the heating systems can be either be designed as local decentralised units or as centralised main mine air heating systems.



## For increased workplace safety and productivity: our methane drainage systems

Mine safety and explosion protection are important elements in the realisation of projects in the underground coal mining industry. The demands on ventilation systems for underground workplaces are high. Special measures are required to cope with the escape of firedamp resulting from the extraction of coal. The main component of firedamp is methane gas which is highly explosive in certain concentrations.

At low levels of gas, it is sufficient to dilute the concentration of methane gas by means of an increased supply of fresh air to avoid the risk of explosion and to ensure mine safety. At higher levels of gas, it is necessary to drain the methane. The installation of a methane drainage system or a combination of both procedures is recommended.

We are able to implement both methods thanks to our extensive expertise. Apart from the CFT expert knowledge, this sector benefits from the more than 30 years of experience of our partner Brockhaus Lennetal GmbH. Methane drainage rates of up to 30,000 m<sup>3</sup>/h are achievable. We engineer and design the pipework necessary for the extraction together with our partner. The resulting solutions contribute to enhanced mine safety and increased productivity.

These systems can be installed in disused mine workings to extract considerable volumes of methane gas which can then be utilised in combined heat and power plants – if the methane content is sufficient. With low concentrations the firedamp is burned off.





For clean air just-in-time:  
our tunnel refurbishment services



When it comes to refurbishing rail and road tunnels, no two projects are the same. However, they do have one thing in common: the time factor. It is essential to avoid work delays and standstills as a result of workplace exposure limits being exceeded due to diesel emissions and dust particles. That's why we are the perfect contact for you with our flexible, innovative solutions and our many years of experience.

With our expertise in the field of ventilation and with the aid of state-of-the-art technology, we oversee tunnel refurbishment projects with regard to dedusting and ventilation in order to guarantee the consistent compliance with workplace exposure limits for respirable air on construction sites. These requirements must be met without causing delays to rail timetables and our ventilation and dedusting equipment must not hinder either the site works or members of the public in the vicinity.

» If required by the project, we are able to provide our customers with on-site support and expertise – worldwide. Personal contact is important for developing ideal solutions. This results in long-standing partnerships and a cooperation based on trust. «

Corinna Both, member of the Executive Board

## CFT dedusting and ventilation expertise in the refurbishment of tunnels.

- Since 2006 we have provided ventilation and, in some cases, also dedusting for more than 100 national and international rail and road tunnel projects.
- We have an extensive network of special service providers for the fast and reliable implementation of projects.
- Our ventilation and dedusting systems are used in tunnels on the inter-city and high-speed lines of the Deutsche Bahn as well as inner-city underground and suburban railways of regional transport companies.
- We have already provided ventilation for tunnels with lengths of up to 10 km.
- If desired we can provide qualified personnel to operate and support the equipment for periods ranging from a few days to several months.
- We can call on an extensive stock of equipment at any time in order to meet the customer specifications.
- We monitor and control our ventilation systems by means of remote data transmission.
- Our ventilation systems are always specified to meet current guidelines.
- With the aid of our CFT Measuring Kit we are able to record the data permanently and thereby provide auditable documentation of the air quality on the job site.





## Securing your investment across the board: our services

Whether during the initial assembly or commissioning, for routine maintenance or rapid response in emergencies, you can count on us 100 % - even after you have invested in our equipment. Our "clean air" specialists travel the world, are readily available and undergo continuous product training to ensure they are all familiar with the latest technological developments. This is essential - original CFT technology is best supported by original CFT service.

Service contracts offer the greatest degree of certainty when it comes to the technical and economic reliability of the equipment in operation. A painstaking maintenance re-

gime offers both protection against unscheduled downtime and improved workplace safety for your personnel.

Our spare parts service ensures that you are supplied quickly and reliably with spare parts anywhere in the world. With our in-house workshop we are able to offer a unique combination of off-the-shelf CFT original spare parts, CFT expertise and qualified CFT personnel - you can rely on the highest degrees of professionalism and efficiency.



### An overview of CFT services:

- on-site assembly guidance / supervision
- on-site assembly assistance
- commissioning and product familiarisation
- training / training courses
- inspection / maintenance
- repair / overhaul
- supply of spare and wear parts
- measurement and monitoring of contaminants
- sale and rental of CFT Measuring Kits (mobile instrumentation packages)



## Optimum networking of competence: the CFH Group

CFH Group combines a number of subsidiaries and stake holdings under one roof which all have one thing in common: excellent engineering providing innovative system solutions for everything to do with air. CFT GmbH Compact Filter Technic has been a 100 % subsidiary of the CFH Group since 2008.

Our group of companies is characterised by a family-style corporate culture. Our vision „Breathe the Difference“ forms the basis for this. For us that means: We want to support our customers with products and services that make a decisive difference in all air-related tasks. For all industries, above ground, below ground and across the globe.

Thanks to this structure, our expertise is perfectly networked. The international presence of the CFH Group ensures that our know-how is available to our customers, wherever and whenever they may need it. Our wealth of knowledge and experience complement each other directly. Our customers reap the benefit from the resulting improvements in efficiency and economy.



### Overview of the services of the CFH Group:

|  |  |   |   |   |   |
|--|--|---|---|---|---|
| <br>Underground dedusting | <br>Surface dedusting | <br>Ventilation                      | <br>Air cooling systems        | <br>Air heating systems     | <br>Temporary tunnel sites |
| <br>Ducts                 | <br>Pipework          | <br>Methane Drainage and Utilization | <br>Ventilation equipment      | <br>PPE dispensing machines | <br>Fibreglass ducting     |
| <br>Mobile hydraulics     | <br>Shaft sinking     | <br>Mobile Telescopic Boom Lift      | <br>Monorail-suspended systems | <br>Engineering             | <br>Second-hand equipment  |

Further information on the holding and shareholdings can be found at [www.cfh-group.info](http://www.cfh-group.info).



Dr Reinhold Both  
CEO & Partner

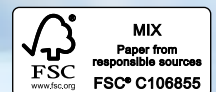
Corinna Both  
Junior Partner

# BREATHE NOW – TALK TO US!

Get in touch! We're sure to have a suitable contact person for all your needs. Our staff will be glad to advise you in English, Russian, Chinese, French, Spanish or Polish.

Visit us at the industry's national and international trade fairs. More on our trade fair participations, further general information and contact details relevant to you can be either be obtained personally from our CFT head office or alternatively online from our website.

We are always interested in your projects and look forward to hearing from you!



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