

**Dear friends and partners of IKTS,**

Ceramics remains an exciting field with very dynamic growth. Fittingly, IKTS continued to grow in 2019 and now has a total budget of 64 million euros. It is particularly satisfying that we were able to increase our total rate of return relative to the operating budget by 5 % compared with the already successful previous year, to now more than 84 %. Approximately half of the income stems from industry, while the other half comes from public funds. This is the way it should be according to the Fraunhofer model. We have confirmed once again that we truly accomplish our mission – to transfer research to the industrial sector. This result has allowed us to undertake investments of nearly 5 million euros across all our departments focused on structural and functional ceramics.

We will continue to implement further development projects in the present year. At our site in Hermsdorf, we plan to open our new building at Technical Center 1 in 2020. The Free State of Thuringia and the Fraunhofer-Gesellschaft have contributed 5 million euros to this effort. The development serves to further our production capabilities for ceramic components, with a strong focus on electrolytes for Na/NiCl<sub>2</sub>-batteries. Furthermore, we plan to build a technical center for the digitized production of lithium-ion batteries in Arnstadt, which is to cooperate closely with local industry and become an incubator for establishing a battery-focused supplier industry. We thank the Free State of Thuringia – specifically the Thuringian Ministry

for the Economic Affairs, Sciences and Digital Society – for its significant financial support. This project adds to our established, long-standing activities on the subject of lithium-ion batteries across all sites. At our project center in Braunschweig (ZESS), operated in cooperation with the Fraunhofer Institutes IFAM and IST, we continue to focus on solid-state batteries. Everything from the electrochemical basics to the production technologies is developed further in Dresden, with Pleissa the site of our pilot line, which we operate in cooperation with thyssenkrupp. The development of special sensor systems and non-destructive testing equipment as well as quality assurance for production technology still takes place at our Dresden-Klotzsche site and obviously goes far beyond battery applications. We are particularly happy that we have been entrusted with coordinating a recently incorporated competence cluster on the subject of green batteries and recycling under the “Forschungsfabrik Batterie” umbrella concept of the German Federal Ministry of Education and Research (BMBF). With strong support from the Free State of Saxony, we will be building a test plant for battery recycling on what up to now has been the Fraunhofer Technical Center for Semiconductor Materials (THM). We will be working closely with our colleagues from the TU Bergakademie Freiberg for this purpose. We thank the Free State of Saxony – in particular the State Ministry of the Sciences, Culture and Tourism (SMWK) – for its support. We will also build on the topics of hydrogen and fuel cells, as



well as electrolytic systems. For these topics, larger projects are underway within the Fraunhofer-Gesellschaft, in which we will be taking part; they are currently being coordinated with the federal and regional governments. More details on that are to follow next year. All this shows that our activities in energy and environmental technology are evolving fast and are increasingly prescient for the current discourse on climate change and environmental protection. We are able and determined to contribute significantly to this debate, in line with our motto, "Fraunhofer for Future".

I also would like to mention our institute's new site in Forchheim, Upper Franconia. Headed by Prof. Dr. Silke Christiansen, it houses a new department, working on "Materials diagnostics and materials data". We will create wholly new opportunities in the field of microscopy and analytics and strengthen our efforts in the area of digitization.

However, beside all these future topics, we will not lose sight of our core business and our other business divisions. On the contrary: We will invest heavily in developing our structural ceramics manufacturing capabilities, from shaping (not just additive manufacturing) and furnace technology to the final processing steps. Functional ceramics is a field that is undergoing very propitious changes, most prominently with regard to our pastes for sensor systems and electronics, and our tape casting

technology. These too are areas in which we have made significant investments in order to be prepared for growing demand.

You can find more highlights and development trends from our business divisions in our report. I hope you will enjoy leafing through this edition. As always, you are welcome to take advantage of our outstanding equipment and our formidable IKTS team. We are looking forward to collaborating with you.

Yours,

Alexander Michaelis

April 2020