

Preface

Energy sector is exercising changes and challenges that never occurred in the past. These are of various matters and extent. There is a continuous process of limiting pollutants emissions, especially in the European Union where subsequent directives such as Industrial Emissions Directive and BAT Conclusions set new, stringent emission limit values. The latter, based on the analyses of available techniques forces plants to invest in emissions abatement installations, which leads to higher costs of generated energy. In the same direction go efforts to combat climate change. After over two decades from the Kyoto protocol, an agreement on global efforts was reached on the 21st Conference of the Parties. Although it does not impose decisive limits on greenhouse gases emissions it creates voluntary obligation to undertake actions that will lead to the decrease of GHG emissions. Two countries the USA and China, which are responsible for almost 40% of global GHG emissions, have ratified COP21 agreement. However, the recent declarations of the USA do not follow the strict climate policy, but the changes in the energy mix, coal replaced by natural gas would lead to lower carbon dioxide emissions. General improvements in efficiency and technological changes in industry would also contribute to the lower GHG emissions. European ambition is that in 2050 renewable sources should dominate energy supplies and dissemination of these technologies is observed. One should not forget about the abundant reserves of cheap coal, which has no economic competitor. Despite relatively high emissions and impact on environment and human health, coal will have a role in energy supplies. However, only clean coal technologies would be acceptable, improvements in efficiency and abatement technologies constitute a plausible path for coal employment.

Air quality seems to be most important in case of Poland. While emissions from energy sector are strictly controlled and have been decreased substantially in the past two decades, the so-called “low emissions” mainly from domestic heating and transport constitute a real threat, particularly in winter season during which allowed concentrations are often exceeded. Many Polish cities are among the ones of poorest air quality. The Polish society has become aware of possible adverse impacts on health and projects have been undertaken to lower associated risks.

Introduction of support systems for renewable energy sources has led to the increase of their share in power generation. On the one hand, it helps to mitigate the air quality problem, but on the other hand, as RES have still high capital costs and low capacity factor in Polish conditions, they contribute to increasing the energy costs for final costumers. Additionally, their intermittent nature requires completely new working conditions of electricity supply system, mainly more flexible operation of classical – fossil generators to cover the residual load. Their unpredictability requires also maintaining the back-up capacity ready to balance disappearing supplies. Development of high capacity storage technologies could help to overcome the balancing problems.

Above considerations touch only the surface of the problems. The conference’s presentations cover wide range of research fields, what corresponds to diverse problems of present fuels and energy sectors.

It is organised biennially together with the Institute of Thermal Power Engineering of Cracow University of Technology. We hope that the Conference will contribute to deeper understanding of these processes as well as finding the means to solve large and small problems of fuels and energy. The novelty of the current edition of the conference has been the organization of two industry minisymposia in order to highlight the cooperation of science with the industry communities. The main goal of such minisymposia involves the bilateral cooperation between science-industry and any initiatives of joint project grants focused on

implementation results in energy and fuel sectors. The innovative formula of the event focuses on the dominant role of the representatives of enterprises, but the researchers, students and other participants will be only listeners and discussants.

The session "Environment" of the Conference "Energy and Fuels 2018" is dedicated to the anniversary of scientific work of Professor Teresa Grzybek

Professor Teresa Grzybek is a graduate of Master and PhD studies at the Faculty of Mathematics, Physics and Chemistry at Jagiellonian University.

She has been dealing with issues related to environmental protection for many years. Particularly, her interests were focused on catalytic processes for treatment of outgases from combustion of fossil fuels and chemical management of greenhouse gases. Within these topics, she cooperated with many scientists from leading foreign centers, such as University of Leipzig, UPMC in Paris, Politecnico di Milano, IST in Lisbon, and others. She is the author of over 230 publications, including 60 with high IF.

She is a respected academic teacher, and was a supervisor of many engineering, master and doctoral theses. Many of her pupils chose scientific career. She was honored with the Medal of the National Education Commission for her didactic activities.

She was three times Vice-Dean for General Affairs of Faculty of Energy and Fuels, and the organizer of the second and third cycle studies, as well as the first director of KIC Innoenergy Master programme Clean Fossil and Alternative Fuels Energy.

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Editors:
Wojciech Suwała
Magdalena Dudek
Stanisław Łopata
Jacek Leszczyński