



“Low energy electron beams for industrial and environmental applications”

EuCARD-2 Workshop with Industry

8-9 December 2016, Warsaw Poland

Science and Technology Facilities Council, UK
CERN - The European Organization for Nuclear Research, Switzerland
Institute of Nuclear Chemistry and Technology, Warsaw, Poland
Fraunhofer-Institute for Organic Electronics, Electron Beam and Plasma Technology FEP, Germany
Warsaw University of Technology, Warsaw, Poland

BACKGROUND

EuCARD-2 is an Integrating Activity Project for coordinated Research and Development on Particle Accelerators, co-funded by the European Commission under the FP7 Capacities Programme. This workshop is being supported by the [EuCARD-2](#) FP7 project, jointly through WP4 ([Accelerator Applications](#)) and WP2 ([Catalysing Innovation](#)).

The Accelerator Applications Workpackage (WP4) facilitates the activities of the European accelerator communities in the development of accelerators for applications in industry, healthcare, energy production and security. It assesses the use of novel technology particularly those developed for accelerator infrastructures used for academic research and for a variety of applications.

The purpose of the meeting is to provide a forum for the presentation and discussion on the progress in methods and technologies used for the research, development and industrial/environmental application of electron beam accelerators of energy range from 100 keV up to 10 MeV. The meeting aims to present state-of-the-art research results and discuss areas where these machines can be implemented as well as discuss the accelerator engineering for these applications. This includes discussions between technologists, scientists and end users of key facilities, as well as decision makers and coordinators of the research programmes at various experimental and industrial facilities.

The potential participants in the network will include many of the major accelerator laboratories in Europe and a number of companies in order to facilitate knowledge exchange between the researchers and industry, by WP2 Catalysing Innovation.

OBJECTIVES

The workshop is aimed at presenting recent developments as well as revisiting global, regional, and national level initiatives for using electron accelerators for processing and modification of materials, medical equipment, food, and gaseous and liquid streams in batch and continuous mode. The meeting will focus on presenting new concepts and practical utilisation of such techniques with an aim to evolve strategy for deployment of these technologies and identify needs for further scientific and technological development in this area. It will provide a forum for sharing practical experiences and lessons learned in use of electron accelerators and formulate the way ahead for integrating



electron beam technology with conventional technologies on a large scale. Finally, it will serve to strengthen contacts and cooperation between technology users and accelerators providers, facility operators, administrators, and end-users.

The workshop aims to address the following main topics:

- Electron accelerator- based technologies for sterilization of healthcare products, curing of materials (polymers crosslinking, lacquer hardening, print ink drying, and rubber modification), new materials synthesis (composites, nanostructures, grafted surfaces and gels), treatment of industrial flue-gases, waste water and sludge.
- Operational experiences of demonstration plants for treatment of flue gases, waste water or solid waste.
- Economic aspects of the technology vs conventional technologies.
- Provide an overview of the state of the art and new uses/developments of electron accelerators for industrial and environmental applications, particularly those that would challenge the current technology.
- Facilities using eb/X convertors for materials processing.
- Mobile electron beam units.
- Reliability of electron accelerators for harsh industrial/environmental conditions of operation.

EXPECTED OUTPUT OF MEETING

The results will be disseminated by journal publications and by seminars at partner institutes, conferences, and European universities, and via web documentation, e.g. web databases. The principal output of the meeting will be a meeting report summarizing status of the technology to meet the present needs, future developments and strategy needed for effective deployment of accelerator technology for industrial and environmental applications. This document will also include technical and commercial feasibility of establishing and operating such facilities and comparative cost-benefit analysis vs conventional technologies.

HOST ORGANIZATION AND VENUE

Institute of Nuclear Chemistry and Technology (INCT), Warsaw, Poland (www.ichtj.waw.pl) in cooperation with Warsaw University of Technology (<http://www.elka.pw.edu.pl/eng>) will be host of the meeting. The Institute is nominated a Collaborating Centre of IAEA in the field related to the subject of the meeting. INCT operates six electron accelerators including a nanosecond-pulse radiolysis setup, a pilot plant for materials and polymers processing, a medical-products sterilization plant, a food sterilisation plant and a laboratory set up for electron beam technologies for purification testing of gaseous and liquid streams. There will be a possibility to visit these facilities for interested participants. The venue of the meeting is WUT Centre for Innovation and Technology Transfer Management, ul. Rektorska 4, 00-614 Warszawa, phone +48 22 234 20 00; fax +48 22 234 14 19 (<http://www.cziitt.pw.edu.pl/>)



Organizers:

Prof. Andrzej G. Chmielewski ; A.Chmielewski@ichtj.waw.pl

Dr Sunil Sabharwal, S.Sabharwal@iaea.org

Dr Bumsoo Han, bshan@eb-tech.com

Frank-Holm Roegner, Frank-Holm.Roegner@fep.fraunhofer.de

Dr Rob Edgecock, rob.edgecock@cern.ch

Dr Henrik Bjerke, henrik.h.bjerke@cern.ch

Dr. Vlad Skarda, vlad.skarda@stfc.ac.uk

Local organizers:

Prof. Ryszard Romaniuk ; R.Romaniuk@ise.pw.edu.pl, Ryszard.Romaniuk@cern.ch

Prof. Andrzej G. Chmielewski ; A.Chmielewski@ichtj.waw.pl

To register, please go to: <http://indico.cern.ch/event/563590/>