

The one megavolt challenge: Not only solved by new materials

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Stanislaw Gubanski is Professor in High Voltage Engineering

The development of the electrical power transmission faces great challenges. Only for Europe the investments are estimated to billions of euro during the next ten years. A quarter of this investment is calculated for cables used for high voltage direct current, since these linkages will play an important role for the development of the transmission capacity. With today's technology a cable with polymer isolation reaches a transmission voltage level of 320 kV. The need of larger and longer transmission capacity are constantly increasing and is crucial for the development of a common electricity market in Europe and for the connection to other continent's grids.

Stanislaw Gubanski is Professor in High Voltage Engineering at the Department of Materials and Manufacturing Technology at Chalmers. He and his fellow researchers, Ulf Gedde and Christian Müller on polymer technology side, work on innovative solutions within applications of different materials for the next generation high voltage direct current cables. Together with a dozen actors in the electro-technical industry they are aiming for a polymer isolated cable for direct current operating at one million volt (1000 kV). This would not only open for broader transnational transmission but also include large scale use of electricity from renewable sources such as solar, off shore wind and wave power.

To lead and be led

"The cooperation with industry gives us information that otherwise would have been difficult to get, such as different practical aspects." he says. The reference groups attached to all the on-going research projects enable effective knowledge transfer in both directions between industry and academia. The purpose of these groups is to keep the research projects relevant for stakeholders. *"It is also a platform for us to give advice to our partners on their issues"* Stanislaw Gubanski says. A few patents have been filed on new materials for cable insulation, but this is an experience Stanislaw Gubanski is not fully comfortable with. *"Industry usually has a stronger interest in patentable inventions than researchers. Going from research results to patentable inventions demands other types of development. Such work is important for them, but is usually not interesting from a research point of view"*, he says continuing *"If they pay for it, I think they should have the possibility to develop it, but if they only are part in a research project granted with governmental funding, I think it is better to make all the results public."*

Engaged for guidance

Focusing on IP ownership would in general disadvantage collaboration with industry, Stanislaw Gubanski believes. *"Contribution to secure and reliable electric power transmission rather finds its ways via standardisations and policy work for the industry"* he says and with his well reputation

in the field and great engagement in organisation such as; International Council on Large Electric Systems (CIGRE), and Institute of Electrical and Electronics Engineers (IEEE), organisations gathering representatives from both industry and academy, working on branch specific issues, formulating guide-lines and common recommendations, he concludes “*I think that makes a larger impact than patents.*”

Text: Niklas Fernqvist

Making Science Useful

Roles: Seven types of roles are identified in relation to making science useful. The roles are developed from different activities for diffusion and utilisation, carried out by one or a group of researchers, or by an entire part of the organisation. The roles are; researcher, educator, advisor, debater, entrepreneur, infrastructure developer and networker. These roles are in general intuitive but develop differently, based on personal characteristics, area of research, the recipients of results within the area, and by different local traditions of how to work with utilisation.

More information: This framework is developed by Staffan Jacobsson, Eugenia Perez Vico, Chalmers University of Technology, Hans Hellsmark, SP Technical Research Institute of Sweden and Merle Jacob, Lund University. For more detailed information, please contact Eugenia Perez Vico (eugenia.perez@chalmers.se) or Hans Hellsmark (hans.hellsmark@sp.se).

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