Ricky's Afterthought:

Reflections on AMPERE 16th: Where are the industrialists?

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It was very nice to meet old friends and colleagues at the 16 international conference at Delft last September. As I mentioned in my opening address, the reason why I thought of establishing this association is that researchers in Europe could not attend the annual IMPI conference. Little did I anticipate though when I staged the 1st conference in the series at St John's in Cambridge in 1986 that we would be here 30 years hence staging the 16th in the series. That gives me great personal satisfaction.

Yet again the comment has been made that we are a scientific association and that we need to attract more industrialists, that is, more users of RF and Microwave equipment. This is a recurrent theme that has been expressed in every AMPERE conference. It is not that Management of AMPERE shies away from encouraging more users to attend our biennial conference, it is simply that they choose not to attend or indeed they may not be aware that it is taking place.

When I was working at the Electricity Council Research Centre (ECRC now trading as CTech Innovation) in the UK which was part of the Electricity Supply Industry (ESI), concerted efforts were made to inform users in industry that RF and Microwaves may offer potential gains in their operations. To give a specific example, an employee in the Local Area Boards working in the Marketing Department would identify an industrial firm, say manufacturing textiles, and suggest that RF could be used to speed up their overall drying process. He would then suggest that specialists (engineers, scientists) at ECRC could visit them on their premises and discuss their process and explain how RF could assist in their moisture levelling requirement and offer the test facilities back at the Centre for trials.

This occurred countless times in a number of electroheat applications such as RF/MW for heating dielectric materials, plasma jet or lasers for cutting metals, annealing billets using induction equipment or curing of paints on vehicle bodies using infrared. I was constantly involved in such call ups and by so doing I met many industrialists some of whom were eventually persuaded to attend our biennial AMPERE meetings in Europe.

Moreover, seminars were staged in industry in the UK, such as the paper or rubber associations where the attendees were exclusively from industry and our experts from ECRC. In these seminars no mention of Maxwell equations or Debye relaxation were made instead after a rudimentary introduction to how RF/MW work, a suitable applicator design was presented followed by typical results stressing the advantages over conventional equipment while finishing with costs and payback.

However, following privatisation of the ESI in the UK in 1991/2, a major restructuring of the industry took place which gradually saw a number of Local Electricity Boards being bought by UK or overseas competitors and as a consequence without exception the Local Area Boards have disappeared from the scene leaving a vacuum as far as the customer/ESI liaison is concerned. These days the task of informing industrial users of the potential gains of RF and MW, or indeed other electroheat options, in their operations is left to specialist units within Universities and private consultancies. As a consequence, there isn't the manpower to track down and contact industrialists to inform them of our biennial meetings. It must be stressed that this

is not a unique problem to the UK, because similar restructuring in the USA saw the involvement of EPRI in attracting users to RF/MW considerably scaled down.

Having said that, I do note that in every past AMPERE conference the participation of equipment manufacturers is steady suggesting that it is not altruism that compels them to hire a booth space and demonstrate their equipment but somehow it is considered worth-while to do so. Besides glancing though the list of participants to the Delft Conference there were over a third from industry.

I offer no solution as to how to attract more users to the AMPERE conferences except to press on our long-standing colleagues to remind their industrial contacts that AMPERE is about to take place and encourage them to attend. Of course confidentiality may be an issue here because it is often the case that an industrialist who uses RF/MW's in their operations may be reluctant to advertise that fact even though everybody else knows that they do!

What is more important, however, is to encourage PhD students and younger researchers to attend because they represent the next generation of attendees at our AMPERE conferences and it is they who will pick up the mantle so the speak and forge ahead new ideas. Moreover, I urge the leaders of university groups involved in this area to encourage their students to attend.

In the final analysis, we have to accept that apart from RF/MW plasmas for the semiconductor industry, small scale microwave chemical synthesis apparatus and some routine heating/drying applications, for example, RF for large scale drying and plastics welding and MW for tempering, rubber curing and drying under vacuum, RF/MW penetration into the manufacturing sector will always remain relatively small representing niche applications despite the occasional hype surrounding a major new application.

Upcoming Events

IMPI-52: The 52nd Annual Microwave Power Symposium

June 26-28, 2018, The Hilton Hotel, Long Beach, California, USA

The Int'l Microwave Power Institute (IMPI) invites scientists, engineers, industry professionals and users to submit papers in all areas of research, development, manufacture, engineering, specification and use of microwave and radio frequency energy systems for noncommunication applications, including industrial microwave and RF, solid state, food technology, plasma, chemical, material processing, and new emerging technologies

Paper submission due January 26, 2018

More information: http://impi.org/symposium-short-courses/

MD-10: Xth Int'l Workshop on Microwave Discharges: Fundamentals and Applications

September 3 – 7, 2018, Zvenigorod, Russia

The scientific program covers all modern aspects of microwave discharges, including:

- methods of microwave plasma generation,
- high and low pressure microwave discharges,
- continuous wave and pulsed microwave discharges,
- interaction of microwaves with a plasma,
- discharge modelling, and diagnostics,
- application of microwave plasma (surface treatment, etching, film deposition, growth of structures, ecology, improvement of burning process, light sources, plasma medicine, analytical chemistry, etc).

Abstract submission due March 1, 2018

More information: http://www.fpl.gpi.ru/md-10/