

REPORT

41st INTERNATIONAL UNIVERSITIES POWER ENGINEERING CONFERENCE (UPEC 2006)[#]

6-8 September 2006, Northumbria University, Newcastle-upon Tyne, UK

T. J. Hammons, Chair, International Practices for Energy Development and Power Generation, University of Glasgow, UK

The 41st International Universities Power Engineering Conference (UPEC 2006) was held 6-8 September 2006 at Northumbria University, Newcastle upon Tyne, United Kingdom. This conference, held annually, continued its tradition in providing opportunities for professional engineers, particularly young engineers, from both industry and academia to share ideas, explore recent developments, current practices and future trends in all aspects of power engineering and related fields. UPEC 2006 was of similar standing to previous conferences by the high quality of the presentations, the technical content of the papers, and the number of delegates attending. As in the past, it had a broad theme, covering all aspects of electrical power engineering, and was attended by academics, researchers, consultants and members of the manufacturing and electrical supply industries. During the sessions, 237 papers selected from 315 uploads from 38 countries were debated. The conference was opened by Professor Kel Fidler, Vice Chancellor, Northumbria University. There were 3 Keynote speakers, 35 technical sessions, 4 interactive sessions and a closing session. All papers in the technical paper sessions were presented orally in five groups of parallel sessions with 15 minutes allowed for each presentation. The high standard of the papers, presentations, and technical discussions was particularly gratifying.

The first full conference was held at the University of Glasgow, UK, in 1967, following an inaugural meeting in Newcastle upon Tyne in 1965. Last year the conference was held at University College Cork, Cork, Ireland and the previous year at University of West England, UK. The 42nd (2007) conference will be hosted by the University of Brighton, Brighton, UK, 4-6th September 2007. Future venues under consideration by the International Steering Committee include Università degli Studi di Padova (University of Padova), Padova, Italy (2008), Strathclyde University, Scotland (2009), Cardiff University, Wales (2010 tentative), and South Westphalia University of Applied Science, Germany (2011 tentative). The working language at all meetings is English.

This year, the technical co-sponsors included IET, IEEE/ PES/PELS and CIGRE, Industrial co-sponsors included PB Power, NaREC, Siemens, Econnect Group UK, and Northumbria University.

The conference was hosted in the city campus of Northumbria University in Newcastle. It was residential lasting 3 full days with both en-suite and standard accommodation provided in the University Halls of Residence on the campus.

1. OPENING SESSION

Dr Ghanim Putrus, Chairman of the Organizing Committee, welcomed delegates and accompanying persons to the conference, Newcastle upon Tyne and UK. He outlined the aims of the conference, summarized the detailed organization of the meeting, and reviewed the program. He said that 315 abstracts were received from all five continents and following a thorough review process by an International Review Committee 237 papers from 38 countries had been included in the Conference Proceedings (ISBN 1-904794-19-X). Papers

[#] This conference review article was prepared by T. J. Hammons, Permanent Secretary UPEC, Chair, International Practices for Energy Development and Power Generation IEEE/PES, University of Glasgow, UK.

were presented orally in five parallel groups of sessions. The full conference papers were published in a CD-ROM.

He said the International Universities Power Engineering Conference or UPEC as it is more commonly known, with a history of over 40 years, has provided and still provides engineers and academia with an opportunity to find and explore the newest trends in the development of Power Engineering and scientific methodology that is connected with it.

After a review carried out by the International Review Committee, papers reflecting the effort and knowledge of engineers and allied scientists from 38 countries have been published in the Proceedings. All these papers, after being judged for their affinity to the subject of the conference in abstract form, were then reviewed in full form by a committee of competent scientists and feedback was provided to improve the quality of the papers whenever necessary. Further, all the papers would be presented by their authors and discussed in the sessions.

He then said that as is the custom of all UPECs, besides being a scientific event helping engineers and allied scientists to get acquainted with state of the art in Power Engineering, UPEC has also a considerable social dimension not only in allowing personal contact and discussions with colleagues from various countries but also in helping them to know things about the country that hosts the conference. For this reason social events and technical visits had been organized.

Dr Putrus then thanked the institutions and the companies supporting the conference. The contributions of members of the International Steering Committee and the Local Organizing Committee, the reviewers, and the session chairpersons were highly appreciated.

The formal opening was undertaken the Vice Chancellor of Northumbria University, Professor Kel Fidler. He indicated that Newcastle upon Tyne and the North East of England are not new to UPEC or power engineering. In fact, UPEC was 'born' in Newcastle, where the first meeting of UPEC, hosted by Dr Jack Dineley, was held in 1965. Prof. Fidler read a message from Dr Dineley to UPEC2006 delegates. Then he described the long history that Newcastle has in electrical power engineering and mentioned that the North East of England was the birthplace of many inventions in power engineering by some of the greatest industrial pioneers in the world. He also indicated how Northumbria University is following the steps of these pioneers by supporting the research and development in the areas of energy systems and power engineering. Then he thanked the organizing committee and declared UPEC2006 formally open.

2. PLENARY LECTURES

These followed the Opening Remarks and at the beginning of the second day. The first Plenary Lecture was given by Dr Malcolm Kennedy, NaREC UK, Blyth, Northumberland, UK; Past Chairman of PB Power Ltd.; and past President of the IEE (currently IET). Dr Kennedy specializes in electricity supply system design, construction and performance. His presentation was entitled 'The Power Industry in Flux'. The second Lecture was given by Professor Nick Jenkins, Director, Joule Centre for Energy Research, University of Manchester, UK. He specializes in renewable energy. His presentation was entitled: 'Europe's Vision of Electricity Networks of the Future'.

The Plenary Lecture given at the beginning of the second day of the conference was delivered by Mr Ole Gjerde, Grid Operation Division, Statnett, Norway. He specializes in power system operation and control. His presentation was entitled 'Background of an European Electricity Market—Start, Results, Challenges'

2.1 The Power Industry in Flux

The first Plenary Lecture was given by Dr Malcolm Kennedy, CBE, FREng, FRSE, NaREC UK, Blyth, Northumberland, Past Chairman of PB Power Ltd.; and Past President of the IEE (currently IET).

He said that the four pillars of the supply of electricity are, and will continue to be, in alphabetical order:

- Affordability
- Competitiveness
- Environment
- Security

Before the privatisation of the electricity supply industry (ESI) in the UK only affordability and security were on the agenda. Competitiveness is now a prominent feature with about six supply companies competing for our business. Protection of the environment is now seen by some as the most important of the four pillars and certainly the one most obviously driving energy policy at the present time.

Energy policy and the way energy is supplied to each customer is also influenced by the forces at work in our society. We live in a world of short termism and profit, ultimate democracy where everyone can have their say and partly as a result of the internet we find that “little knowledge is a dangerous thing”. We also live in a country where there is a widening gap between the rich and the poor. These forces at work in society in general manifest themselves in the ESI, environmental protection arguably being the most important. We also live in a “NIMBY” world. There are all manner of pressure groups advocating or opposing safe technology being used or proposed in the generation and transmission of electricity. Governments and Regulators repeatedly intervene in the privatised industry when they see the imperfect market is not delivering their policies, after all the industry is in private hands and profit is essential.

Emissions, it seems, is driving our agenda today with carbon dioxide used as a proxy for all greenhouse gases. The 1997 Kyoto Protocol attempts to allocate the amount that each country can generate in terms of CO₂ and each signatory to the agreement must allocate a proportion of its emissions to its electricity supply industry. Several countries, USA and Australia included, do not agree with the Kyoto approach and have their own way of tackling emissions. Carbon dioxide, a fairly useless gas apart from putting out small fires and making fizzy drinks, now has a value in a developing European emissions trading scheme. Today a tonne of carbon dioxide is worth perhaps 20 Euros and it is this that penalises all forms of generation that produce carbon dioxide and in effect acts as a financial incentive to all those forms that do not.

So then, the great debates rage. Will nuclear or clean coal be the mass providers of electricity; which renewables? Can we pick winners? Are the gas and electricity infrastructures up to the job? They will almost certainly need heavy investment. Fuel mix, price volatility and security are all part of the future conundrum but what is certain is that life will go on with less carbon.

Looking at examples of how energy policy and infrastructure are developing we may first look at Europe with the enlarged EU. The ESI in Europe is now characterised by many directives issued since 1996 and a consolidating industry featuring several national champions. Sometimes it is difficult to determine whether competition is real or imaginary. The whole idea of a free market in Europe is constrained by lack of cross border trading. Incumbents seem to be totally in control, unbundling is in its infancy and there is significant mistrust between new entrants and those who currently control the industry.

Despite these shortcomings there does seem to be progress in Europe in increasing the proportion of electricity produced from renewable energy sources and it is expected that the percentage of gross electricity consumption will rise from some 14% in 1997 to 22% in 2010. The projection for 2020 is some 34% of electricity production that is a challenging target.

In the last year or two most of the new generating capacity in Europe has been of the renewable type with the individual member states supporting the different technologies with one or two basic mechanisms.

Either certificates which are tradable or feed in tariffs which remove risk to the generator but are deemed to be less efficient.

As regards the prospects for renewable generation technologies, onshore wind is nearing maturity and is the “cheapest” renewable and it is arguable whether this still requires an ongoing subsidy. Offshore wind with higher connection and O&M costs is uncertain and unproven in deep water. Wave and tidal still carry high costs and are unlikely to be commercially attractive for at least 10 years. Photovoltaic costs are reducing and efficiency levels improving for both off and on grid connection. Biomass has a huge potential and is currently being blended with pulverised fuel but the fuel itself will ultimately compete with food production which represents a significant risk to its development.

Partly due to climate and differing degrees of financial support and the size of the system itself Germany, Spain and the US together represent three-quarters of the current world wind power market.

New investment in renewable generation depends on many factors and the drivers for private investment include:-

- Climate and availability of primary renewable energy source.
- Unexploited potential of primary renewable energy sources and availability of appropriate finance.
- Market availability and confidence.
- Ease (or otherwise) of grid connections.
- Political stability and clarity of Energy Policy, no ‘U’ turns.
- Tariffs and subsidies.
- Market saturation.

Turning now to the UK the current Government issued their Energy Policy White Paper in February 2003. There were four major points as follows:-

- To put ourselves on a path to cut the UK’s CO₂ emissions by some 60% by about 2050, with real progress by 2020.
- To maintain the reliability of energy supplies.
- To promote competitive markets in the UK and beyond, helping to raise the rate of sustainable economic growth and improve our productivity.
- To ensure that every home is adequately affordably heated.

In July 2006 the same Government, worried by security of supply and the retirement of more than one quarter of the nation’s generating plant in the next 10 years, published a review. The principles are the same as they were 3 years ago, there are a few more detailed pointers, eg the possibility of new nuclear build but there still seems a lack of urgency and certainty for the investors.

It should be remembered that the UK Government has introduced almost 20 major interventions in the direction of the electricity supply industry in the UK since the end of World War 1. Since the early 90s several of these interventions have been concerned with the support and promotion of renewable forms of generation.

Currently the UK has an admirable mix of sources of generation namely gas 37%, coal 36% and nuclear 20%. Renewables still only form 4% of the electricity generated.

It seems that to make good the retirement of old coal and nuclear plant over the next 10 years and to cater for any increase in demand, gas generation will still be the fuel of choice despite security worries and its possible adverse effect on fuel diversity. Within this timescale it is unlikely that any new nuclear plant will be commissioned although, optimistically, clean coal plant may be technically and economically attractive towards the end of this period. Renewables must play their part although the contribution will not

be dramatic. Whatever contribution renewables do make will require significant investment in the high voltage national grid system and in the distribution systems where distributed generation will revolutionise the way in which power is transmitted and controlled. Significant investment will undoubtedly be required to the transmission and distribution assets of the nation where most of the investment over the last 30 years has been in replacing like for like equipment.

Summarising, therefore, the issues in Europe today and tomorrow are:-

- The Emissions Agenda.
- Cross border trading. But not enough yet!
- Increased consolidation of ownership
- “National Champions”.
- Increased prices.
- Competition real or imaginary?
- Nuclear and renewables debate.

Specifically for the UK the changes in the electricity supply industry by 2020 will look like this:-

- More focus on environmental and public health issues but increased acceptance of need to build new facilities and infrastructure.
- Increasing Government pressure on suppliers to make substantial improvements in energy efficiency.
- Develop half to full scale demonstration projects in coal gasification, energy storage, wave power and other nascent renewable sources.
- After no more than 5 years participate in a new gas fired combined cycle generation programme.
- See the beginnings in the same 5 year period of a new build nuclear generation programme.
- Onshore wind generation will saturate towards the end of the period, offshore wind will develop but only in shallow water.
- Transmission links to Ireland and other adjacent continental European countries to facilitate more extensive trading.
- Innovative development to produce active local distribution networks to accommodate increased distributed generation including renewables and CHP.
- Oblige customers to pay significantly more for their electricity!

The electricity supply industry throughout the world has always risen to the challenges and has always attracted the right people to do so. The market will drive changes into the future and those aspects that have characterised the electricity supply industry in the past will have as an additional and arguably more important feature. Making the whole industry environmentally friendly made possible not only by subsidising renewable forms of generation and also by having a tradable value for each tonne of carbon dioxide produced by the industry.

2.2 Background for an European Electricity Market—Start, Results, Challenges

Ole Gjerde, Grid Operation Division, Statnett, Norway.

The idea of the development of an integrated electricity market in Europe came as a result of the liberalization process in Europe in the 1980s. This keynote speech covered the start of the development, described results achieved so far and showed some challenges ahead.

The stated goal of the liberalization process was to increase the efficiency in the electricity sector, reduce cost, freeing of capital and give incentives for private investments. The means to achieve this was competition. Included in this was the separation of competitive and monopoly activities. The driving forces behind the process were political decisions and pressure from market actors.

Vertically integrated companies covering generation, transmission and distribution characterized the pre-liberalized situation in most European countries. Often one dominant state owned company dominated the electricity sector. There was no or little competition. Prices were often politically decided. Exchange of electricity between countries was normally based on bilateral contracts, often long term. Border tariffs had to be paid.

Development of an integrated market of electricity in Europe

The start of the construction of an integrated and competitive European market of electricity can be divided into two phases:

- The set up of national laws according to directives from the European Union
- The definition of harmonized rules to access the European networks

The political framework was given through directives, and the directive 96/92 EC Internal Market in Electricity was fundamental for the development. This directive came into force on 19 February 1996 and it was required that all member states should have implemented it by the latest 19 February 1999. The directive required separation of competitive and monopoly activities, equal access to networks, transparent network tariffs and elimination of border tariffs.

Not all countries followed the timetable of the 1996 directive. The EU Commission therefore put forward new directives with possibilities to use stronger measures. This includes directive 2003/54 EC Common Rules for the Internal Market in Electricity together with the Regulation (EEC) 1228/2003 Condition for Access to the Network for Cross-Border Exchange of Electricity. Guidelines for transmission tariffication and congestion management were also developed. In addition directive 2005/89 EC Measures to Safeguard Security of Supply and infrastructure investment was added.

In addition to the political decisions it has been important to have close contact between different stakeholders in the European electricity sector to develop the market. CEER the organization of the regulators and ETSO the association of the Transmission System Operators have played a vital role.

The network is the physical market place. Electricity cannot be stored. There must be an instantaneous balance between generation and consumption. To keep this balance is the responsibility of the TSOs.

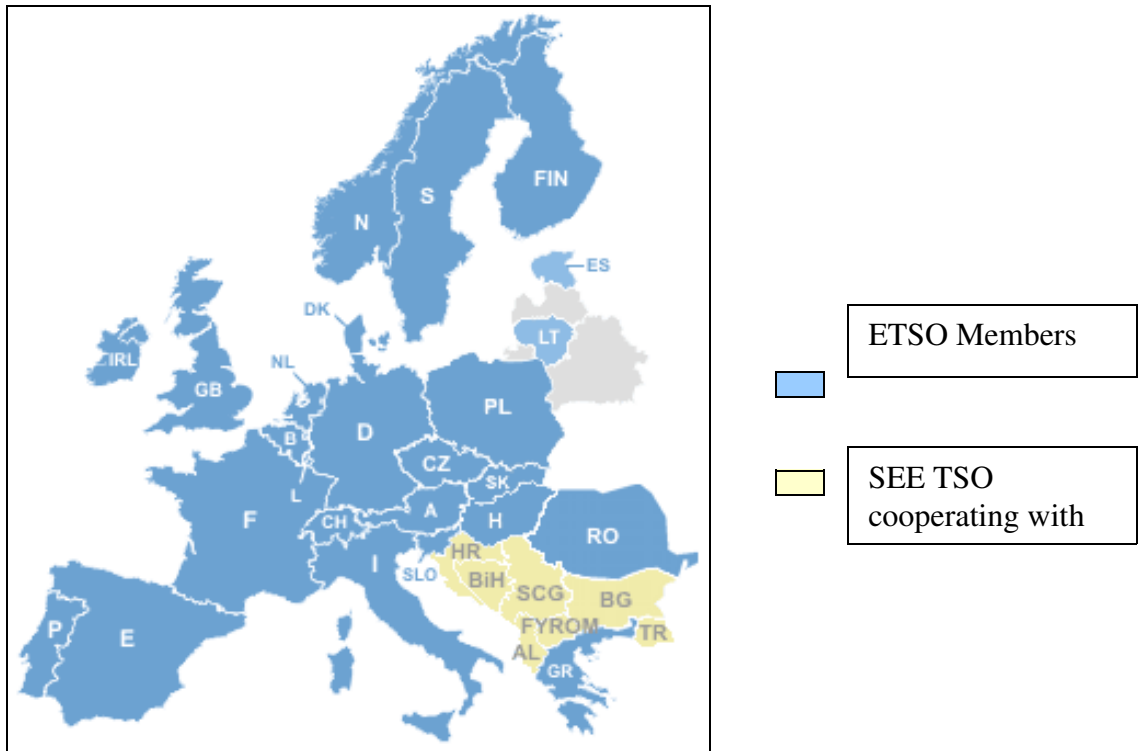


Figure 1. ETSO member status 2006

To illustrate the development of the market it can be interesting to look at the development of ETSO the association of the European TSOs. When it was founded in July 1999 it had members from 15 countries. Today the member situation is shown in Figure 1. There are full members from 25 countries and cooperation with TSOs in another 7 countries in southeastern Europe.

The keynote speaker gave examples of the market development in UK and the Nordic countries. There are several results already achieved in the development of the internal market of electricity in Europe. One very important result was the elimination of cross-border fees from 1 March 2001 for those countries joining the ITC (Inter TSO Compensation) scheme. There is now no more pancaking of fees when electricity is sold over several consecutive borders. There is only payment of access tariff at the point of connection to the grid. Furthermore there has been a harmonization of tariffs. The same is the case for congestion management, however for congestion management there is still a long way to go to really have a harmonized solution over Europe. There has also been an increase in transparency and exchange of data. Market access has become easier for all players.

In Figure 2 there is shown a market structure for Europe, as it is presented by the European Regulators Group for Electricity and Gas (ERGEG). What can be seen is that there are different kinds of electricity markets.

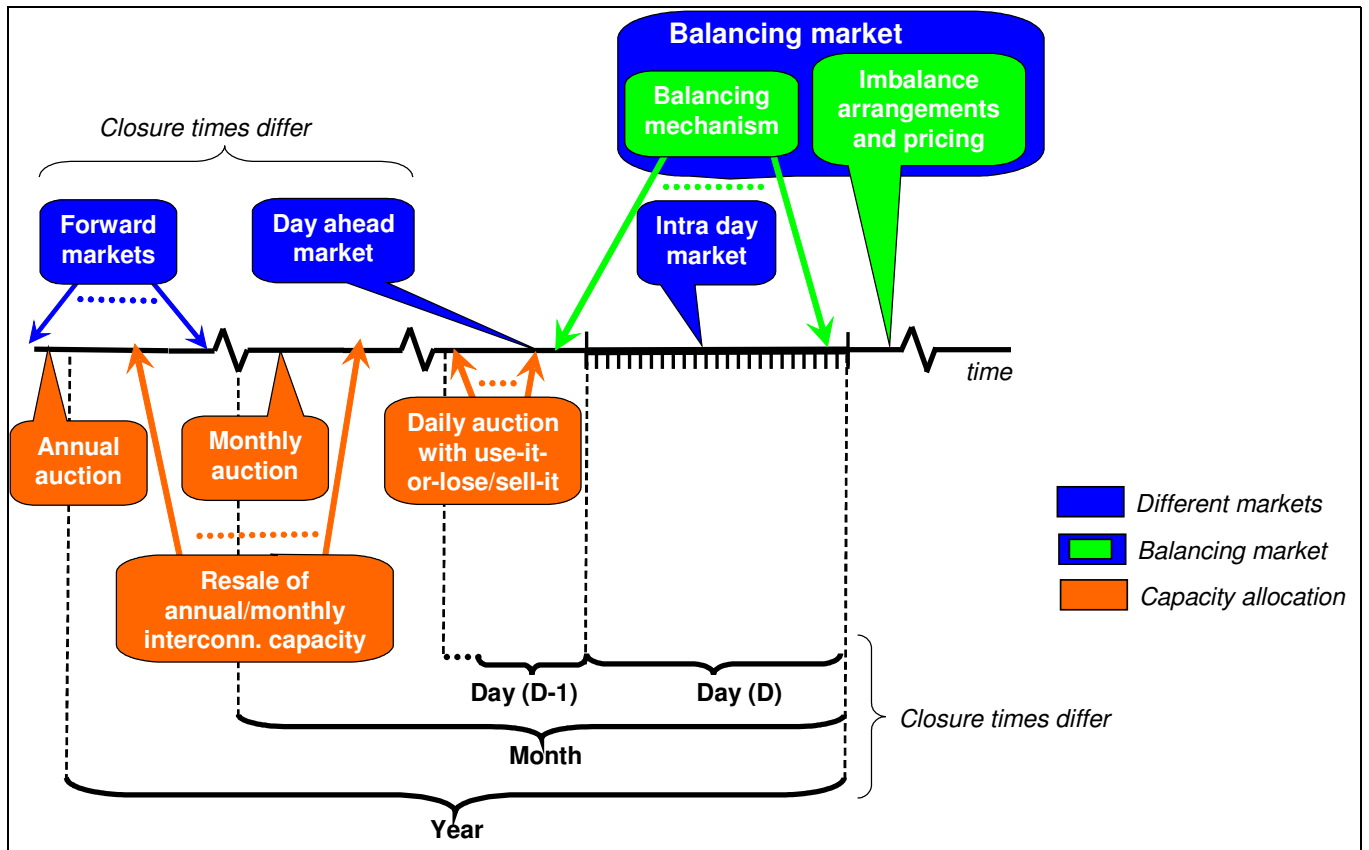


Figure 2. Market structure in Europe. (Source: ERGEG)

The focus for the development of an integrated market of electricity in Europe is in the first place the day ahead physical electricity market.

Challenges for the European Market of Electricity

One common market of electricity in Europe has to be based on the development of regional markets. It is a need to develop more interconnector capacity to develop both regional markets and a common European market. Transparency regarding information has to be improved. Furthermore tariffs and congestion management methods have to be better harmonized.

The keynote speaker gave examples of developments that will help the evolution of the European electricity market. The Nor Ned submarine cable being built between the Netherlands and Norway is one example of interconnector capacity being constructed. Other examples mentioned were demand side response (DR) that can help in the balancing of the power system.

One important challenge for the development of the market is to find the right balance between the three corner stones: Market solutions, security of supply and environmental sustainable developments.

The European Union has initiated a work based on regional initiatives, where the idea is to create well functioning regional markets that then later can develop into a common European market. Seven regions have been created where the regulators have a lead role. This is followed up by ERGEG. Each region has identified its priority topics to work on. The following is their list of priority topics:

- Congestion management – implementation of CM guidelines
- Coordination of auctions on interconnectors
- Balancing markets – reciprocal access

- Wholesale market transparency.

In Figure 3 it is shown how ERGEG through the regional initiative work, has organized market projects.

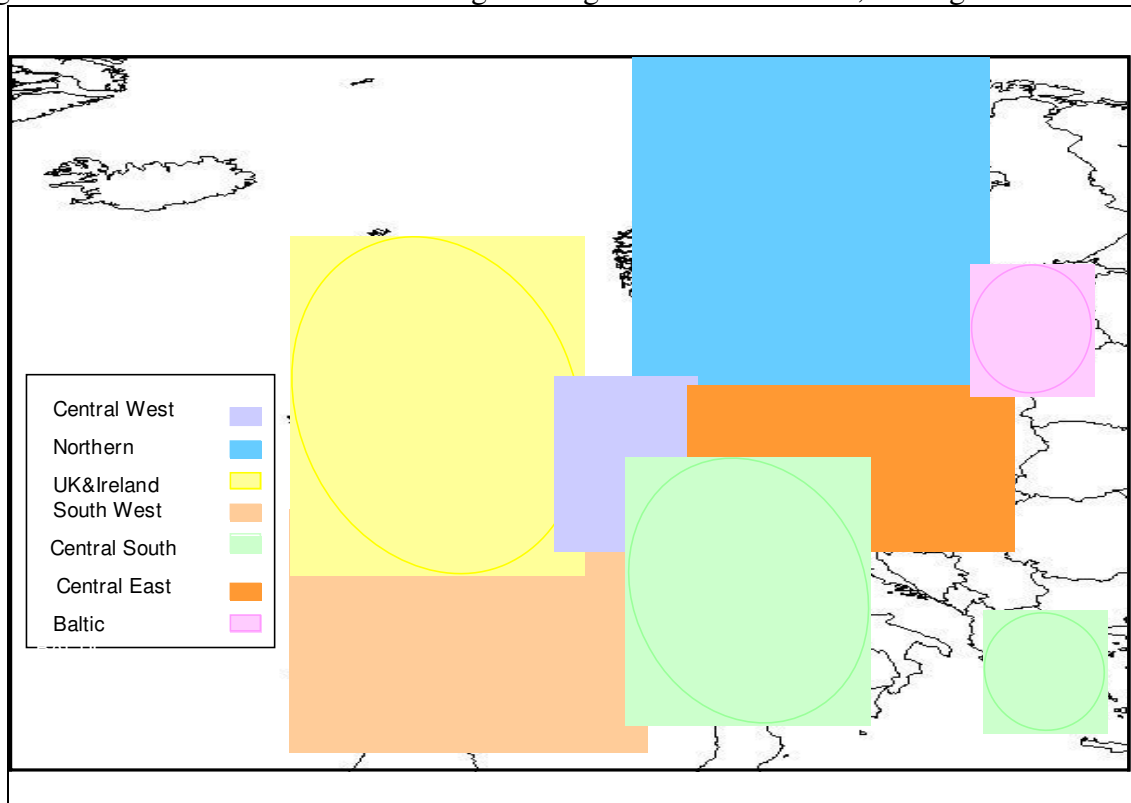


Figure 3. Electricity Regional Energy Market Projects

In the longer term it is necessary also to include activities in the following areas:

- Further investments in interconnectors
- Imbalance pricing harmonization
- The development of the regulatory framework
- Transmission pricing.

Finally it has to be underlined that to have further development of the electricity market in Europe it is important that the involved parties have confidence in each other.

3 TECHNICAL PAPER SESSIONS

Topics debated in the five parallel groups of technical paper sessions on the first day included:

Power Generation, Renewable Energy Systems, Distributed Generation, Transmission and Distribution, Future Power Networks, Power System Operation and Control, Power Electronics and Devices, Electrical Machines and Drives, System Integrity and Protection, Power Quality, and Expert Systems,

On the second day, there were further parallel groups of sessions on Renewable Energy Systems, Distributed Generation, Transmission and Distribution, System Integrity and Protection, and sessions on power System Operation and Control, Power Conversion, and Power Engineering Education.

Topics debated in parallel groups of technical paper sessions on the third day included topics debated on the first two days together with FACTS: Power Electronic Applications.

4. OTHER CONFERENCE HIGHLIGHTS

These included:

- Welcome Buffet Refreshments in Rutherford Hall at the Main University Campus on the Tuesday before the Conference.
- The Civic Reception on the Wednesday evening at the Banqueting Suite, the Civic Centre, Newcastle-upon-Tyne at which the Sheriff and Deputy Lord Mayor of Newcastle Councilor Peter Arnold hosted delegates and guests at the Conference.
- Six Cultural Excursions on the Thursday afternoon that included a walking tour of Newcastle, the Discovery Museum in Newcastle-upon-Tyne, The Big Lamp Brewery in Newburn, Clothier High Voltage Laboratory and Siemens VA-Tech Protection and Control in Hebborn, New and Renewable Energy Centre (NaREC) in Blyth, and Cragside Engineering Walk in Rothbury.
- Conference Banquet on the Thursday evening at the Assembly Rooms, Fenkle Street, Newcastle-upon-Tyne. This grand Georgian building dating back to 1776 has been lovingly restored to its former glory, and is now a premier conference and banqueting location in the North of England.
- Awards Luncheon at Claude Gibb Hall on the Friday at the conclusion of the Conference

5. CONFERENCE BANQUET

This took place on the Thursday evening at the Assembly Rooms, Fenkle Street, Newcastle-upon-Tyne.

Besides the English food, there was an after dinner speech by Dr. Guy Nicholson, Chief Executive, Econnect Group Ltd. He discussed Renewable Energy.

He reflected on the changes since he was an undergraduate in the 1970s when there was also flurry of activity into alternative energy due to price and availability of fossil fuels. He pointed out that in the UK nuclear energy was touted as the cheapest source of power under the government owned CEGB but that at privatization in the late 1980s the true costs were found to be twice that of conventional plant and nuclear was pulled from the privatization. Under the liberalized trading arrangements of the electricity Pool, a subsidy system was put in place for nuclear generation until 1998 when the eight major power stations were privatized at a price less than the cost of the latest reactor, Sizewell B. A few years later this new company, British Energy, had to be bailed out by the UK Government to the tune of £650m to avoid bankruptcy in the new electricity market "NETA". The UK nuclear clean up bill currently stands at £70bn. If this were invested in wind power generation it would produce more electricity in 10 years than that produced by all the UK nuclear stations to date. On a global level, very soon the amount of solar PV modules manufactured annually will be greater than the yearly new nuclear capacity. Guy Nicholson pointed out that there had been huge innovations and cost reductions in renewable energy with a much lower level of support than nuclear. Innovation was also badly needed in power systems and networks to accommodate environmentally friendly generation and that island power systems would probably provide the cutting edge for these developments. Power systems engineers were therefore at the cutting edge of starting to reverse the trend of increasing CO2 emissions.

Towards the end of the Banquet, Peter Howson (UPEC 2007 Conference Organizer, Brighton University, UK highlighted the main events and proposed program for the 2007 Conference that will be hosted by Brighton University, England, September 2007.

6. AWARDS

Prizes were awarded by *UPEC2006* for the Best Paper and for the Best Oral Presentation by a Young Engineer under the age of 30. *Wuhan Hi-Tech Electrical Engineering Company of China* awarded a prize for the best paper in Electrical Power Engineering, and *ERA Technology* awarded a prize for the best paper in Power Systems.

The *UPEC2006 Best Paper* prize was awarded to Miss Susana Almeida from Portugal for a paper entitled “Severe contingencies analysis in Portuguese transmission system”. Co-authors are Rui Pestana and F. Maciel Barbosa. This paper was presented in Session TAT6c on “Power System Operation and Control”.

The recipient of the *UPEC2006 Best Oral Presentation by a Young Engineer under the Age of 30* was Mr. F. Moro from Italy for a paper entitled “A simplified procedure for computing the environmental magnetic field generated by power lines with complex geometric configurations”. Co-authors were A. Doni and R. Turri. This paper was presented in Session TAT16 on Power Engineering Education.

The *ERA Technology* prize for the best paper in Power Systems was awarded to Mr. Athanasio Dimopoulos from the United Kingdom for a paper entitled “Parametric analysis of safety limit-curves in earthing systems and comparison of international standard recommendations”. Co-authors were H. Griffiths, A. Haddad, A. Ainsley, F. Ainslie and D. Frame. This paper was presented in Session WPT4b on Transmission and Distribution.

The *Wuhan Hi-Tech Electrical Engineering Company of China* prize was awarded to Mr. Stuart Haig from the United Kingdom for a paper entitled “Analysing the technology needs of future distribution networks”. Co-authors were R.M. Tumilty, G.M. Burt and J.R. McDonald. This paper was presented in Session TAT3b on Distributed Generation.

7. CONFERENCE PROCEEDINGS

All technical papers were incorporated in the UPEC 2006 Proceedings on CD-ROM (with 373-page book of conference abstracts). The CD ROM and book of abstracts were distributed to delegates at the conference. UPEC 2006 Proceedings may be purchased (CD-ROM and book of abstracts) for 35 British Pounds (£20 for the CD only) plus postage, until supplies are exhausted, from Dr Ghanim Putrus, UPEC 2006 Conference Organizer. His contact details are: School of Computing, Engineering and Information Sciences; Ellison Building; Northumbria University; Newcastle-upon-Tyne, NE1 8ST; UK; E-mail: ghanim.putrus@unn.ac.uk ; Tel: +44 191 227 3222, +44 191 227 3107; Fax: +44 191 227 3598.

8. UPEC 2007

In closing the conference, Dr Ghanim Putrus stated that the 42nd International Universities Power Engineering Conference (UPEC 2007) is to be hosted by the Faculty of Science and Engineering, University of Brighton, UK, September 4-6, 2007. It will be organized by Peter Howson (E-mail: P.A.Howson@bton.ac.uk) and will be located at the University’s Falmer campus that is located approximately 2½ miles northeast of central Brighton. He said its aim is to provide a professional forum for engineers and research scientists from the

universities, consultants, and in the manufacturing and supply industries to present their work and explore potential trends and recent developments, current practices in Power Engineering and related fields. The conference will be residential for three nights. There will be a technical exhibition by invited sponsors, and a number of keynote addresses will be scheduled. A number of technical and cultural visits are also planned.

For more information on UPEC 2007, contact: UPEC 2007 Secretariat, School of Engineering, University of Brighton, Cockcroft Building, Lewes Rd, Brighton, BN2 4GJ, UK, Tel: +44 1273 642 234, Fax: +44 1273 642 301; E-mail: P.A.Howson@bton.ac.uk

9 CONFERENCE WRAP-UP

Papers were well thought out and benefited from the 15 minutes allowed for presentation and discussion of each paper. The general level of the discussions was extraordinarily high and stimulating. Of particular note was the high standard of the presentations by the younger members of the profession. The pleasure the participants experienced in meeting colleagues with similar interests from so many countries should be particularly noted

Gratitude is expressed to Ghanim Putrus, UPEC 2006 Conference Organizer, Members of UPEC Steering Committee, and colleagues at University of Northumbria for the detailed organization of the meeting. Ghanim Putrus and colleagues at Northumbria University are congratulated for organizing one of the most successful events ever.

T. J. Hammons
November 1, 2006

**42ND INTERNATIONAL UNIVERSITIES POWER ENGINEERING CONFERENCE (UPEC
2007)**

UNIVERSITY OF BRIGHTON, UK

SEPTEMBER 4-6, 2007

Call for Papers

Abstract Deadline: February 7, 2007

The 42nd International Universities Power Engineering Conference (UPEC 2007) will be hosted by the Faculty of Science and Engineering, University of Brighton, UK, September 4-6, 2007. It will be located at the University's Falmer campus that is located approximately 2½ miles northeast of central Brighton. The city of Brighton is located on the South East coast of England and is easily accessible by road (M23 from the London orbital Motorway M25), by numerous airlines (London Gatwick airport is within 18 miles of Brighton), and by rail. The Falmer campus is served with a rail station. The conference is co-sponsored by IEEE, IEE, and CIGRE. Its aim is to provide a professional forum for engineers and research scientists from the universities, consultants, and in the manufacturing and supply industries to present their work and explore potential trends and recent developments, current practices in Power Engineering and related fields. Although the forum is open to all levels of participants, the Secretariat particularly encourages young academics and research students to attend. The conference will cover all aspects of power engineering. It will be residential for three nights. There will be a technical exhibition by invited sponsors, and a number of keynote addresses will be scheduled. A number of technical and cultural visits are also planned. The working language is English. Accepted papers will be presented in oral and in interactive sessions.

UPEC 2007 seeks papers in all aspects of power engineering, including the following topics:

- 1) Power Generation
- 2) Power Utilization
- 3) Future Power Networks
- 4) Machines and Drives
- 5) System Integrity and Protection
- 6) Power System Operation and Control
- 7) High Voltage Engineering and Dielectrics
- 8) Expert Systems
- 9) Power Quality
- 10) Power Electronics and Devices
- 11) Renewable Energy Systems
- 12) Electromagnetic/Electrostatic Effects
- 13) Distributed Generation
- 14) Power / HV Engineering Education
- 15) Power Conversion
- 16) Lightning Protection

Prospective Authors are invited to submit an abstract (max 2 A4 pages) in the relevant subject area to the UPEC 2007 Secretariat, either electronically by E-mail or by PO Mail, before February 9 2007. The PO address is: School of Engineering, The University of Brighton, Cockcroft Building, Lewes Rd, Brighton, BN2 4GJ, UK, Tel: +44 1273 642 234, Fax: +44 1273 642 301. The Conference organizer is Dr. Peter Howson (E-mail: P.A.Howson@bton.ac.uk). On the front page Prospective Authors should give the full name, address, affiliation, and E-mail address of the author to communicate with, the number of the area the paper is from taken from in the above list, the preference for presentation (oral or interactive), and title of the paper, Notification of acceptance will be by 23 March 2007. Final camera-ready papers are to be received by May 18, 2007 for final review. Style of submission is available on the conference web site www.upec2007.org At least one of the authors for each paper will be required to register and attend the conference. Registration will be available on the conference website.