EPIC Newsletter - July 2011

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Editorial

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Digital Village – ICT Large Scale Project

Broadband connectivity will become firmly established as the “fourth utility” by 2020. It will be crucial for our modern digital society and economy: new services and applications such as ultra high-definition video, tele-working, e-Mobility, e-Government, e-Health and e-Energy will depend and rely on such an infrastructure which will enable the challenge to significantly reduce CO_2 emissions through the implementation of the smart home, smart-grid and smart-city paradigms.

In the context of the Key Enabling Technologies initiative of the Commission, our vision is to establish European digital villages to validate advanced ultra-fast broadband architectures, new applications and services in multiple deployments (overall EU target is >150,000 people). In these ‘Digital Villages’, residents can enjoy and explore fiber-enabled broadband access at sustainable average rates in excess of 1Gb/s, using existing “best of breed” technologies.

Such Digital Villages will provide advanced regional test-beds across EC countries, serving as powerful tool to bridge the valley between applied research and commercial exploitation. The proposal is targeting the following goals:

1. To design, implement and evaluate advanced transport, access, and home network infrastructures together with components and systems for ultra high speed broadband.
2. To model and evaluate new broadband networks connectivity together with services & applications.
3. Provide tailored and coordinated development of new business models.
4. To work in synergy with similar EC-sponsored initiatives.

To address the target users stated above, a total of 55,000 to 135,000 homes should be connected. Within such “Digital Villages”, selected Smart City or Smart Home solutions can be deployed interconnected and tested (e.g. smart grids aimed at controlling and reducing power consumption and waste).

The benefits of the Digital Villages will thus be twofold: (1) they will allow deploying fiber-infrastructure more quickly in some small cities and non dense areas, and (2) will speed up the development of advanced broadband technologies and services by manufacturers, operators and service providers.
The positive effect on employment across Europe should create about 10 million additional jobs.

Forecasts suggest that the number of world-wide mobile and fixed connections could exceed 50 billion by 2020. However, Fiber to the User (FTTX) is practically absent in Europe and represents a substantial market opportunity which is further enlarged by the revenue from new services and applications only enabled by ultra-broadband optical access.

Europe is home to the world’s largest and most successful telecom industry, with 7 out of the 10 largest telecom operators (Telefonica, Deutsche Telekom, Vodafone, Orange, BT, Telecom Italia, Telenor Group) alongside major world telecom manufacturers (Alcatel-Lucent, Ericsson, Nokia, Nokia Siemens Networks, Adva Optical Networking).

Piergiorgio Sessarego, Ericsson

News

Dr. Drew NELSON, CEO of IQE is elected President of EPIC

EPIC, the European Photonics Industry Consortium is pleased to announce the election of Dr. Drew Nelson, CEO of IQE (Cardiff, UK) as President of EPIC. Drew Nelson succeeds Jean-François Coutris of Sagem Défense et Sécurité who completed 2 terms serving as 2nd President of the EPIC association. Dr. Nelson has begun his term on 5 April 2011, presiding the Annual General Assembly of EPIC in Paris, France.

Drew Nelson co-founded EPI in 1988, raising start up capital from Shell Ventures, and has held the role of CEO since 1996, when he led a management buy-out from Shell.

In 1999, he led the merger of EPI with US based QED, forming the IQE Group, which was subsequently listed, initially on EASDAQ in 1999, then fully listed on the LSE in 2000. IQE has grown to be the largest outsource manufacturer of advanced semiconductor wafers, supplying all 12 of the top wireless chip companies globally, and now consists of 8 group companies spanning Europe, US and Asia.

In July 2000, Dr. Nelson was awarded a silver medal by the Royal Academy of Engineering for his contribution to British Engineering and was awarded the OBE for services to the Electronics Industry in the Queen's Birthday Honours, 2001. In 2004 he was elected as a Fellow of the Royal Academy of Engineering, and was awarded an Honorary Dr. Eng degree from the University of Sheffield in 2005.

New EPIC Members

University of Barcelona:
Departments of Electronics, Applied Physics and Optics
The University of Barcelona specialises in photonics with R&D programmes in:

- Optical and electrical properties of materials and devices
- Nanostructured silicon and related materials
- Nanodevices with quantum properties
- Silicon Photonics and the making of bright LEDs and laser
- Application of nanomaterials to photovoltaics
- Thin film materials for optoelectronic applications
- Integrated optical sensors.

Professor Blas Garrido is the principal contact for EPIC. He has recently been promoted to Full Professor of Material and Devices for Optoelectronics.
blas@el.ub.es

IREC: the Institute for Research in Energy of Catalunya
IREC was created in 2008 with the objective to meet the energy requirements in the current social, political and economic environment. The IREC R+D+I programme is focused on :

- Functional nanomaterials
- Catalysis for energy conversion
- Solar materials and systems
- Nanoionics and fuel cells
- Energy storage and harvesting

The principal EPIC contact at IREC is Dr. Josep Carreras, Head of the Lighting Group.
jcarreras@irec.cat

CSEM – an innovation center
CSEM, Centre Suisse d' Electronique et de Microtechnique (Swiss Center for Electronics and Microtechnology), founded in 1984, is a private research and development center specializing in microtechnology, nanotechnology, microelectronics, photonics, system engineering and communications technologies. It offers its customers and industry partners custom-made innovative solutions based on its knowledge of the market and technological expertise derived from applied research. Having founded several start-ups, it contributes to developing Switzerland as an industrial location.

Approximately 400 highly qualified and specialized employees from various scientific and technical disciplines work for CSEM in Neuchâtel, Zurich, Basel, Alpnach and Landquart. EPIC contact is Christian Bosshard, Section Head Optics & Packaging
christian.bosshard@csem.ch

Oxxius
Oxxius is an early-stage company, established in 2002 to bring disruptive innovations to the market of lasers in the visible wavelengths domain. Oxxius develops advanced laser modules targeting applications in biophotonics, metrology, spectroscopy and other instrumentation applications, for both research and industrial customers.

Oxxius products an innovative, patented solid-state laser architecture offering major advances in compactness, reliability and cost of ownership. In addition, this technology enables exceptional spectral and spatial beam characteristics, as well as market-leading power levels.
Oxxius is headquartered in western France and has a sales and support office in California.

EPIC contact is Thierry Georges, founder and CEO
tgeorges@oxxius.com

OCLARO joins the EPIC Board of Governors

Contact: www.epic-assoc.com

The European Photonics Industry Consortium, EPIC, is pleased to announce that Oclaro has joined the Governing Board of the Consortium. EPIC promotes sustainable growth photonics industries and R&D organisations across Europe through initiatives to build revenues, improve access to R&D resources, and development of timely market and technology information. In 2010, the ROI to EPIC members exceeded 11 times investment. Since its inception in 2003, EPIC members working together have transformed the landscape for photonics in Europe.

The Governing Board defines the principal directions of EPIC, including focus areas, strategy, resources and membership. Oclaro joins Aixtron, Heinrich-Hertz-Institute, IQE, and Sagem. The EPIC Board is presided by Dr. Drew Nelson of IQE.

Oclaro has been a member of EPIC since 2004. The company will be represented by Dr. Andy Carter, Chief Technology Officer. He has global responsibility for Technology reporting into the CEO, Alain Couder. Prior to Oclaro, Andy held senior technology positions within Bookham, Marconi and Plessey, where he has been responsible for many aspects of optoelectronic device design, applications and engineering. Andy views membership of the EPIC organisation as an important element in driving innovation and leadership in photonics, and is particularly significant as Oclaro has major R&D and chip manufacturing sites in Europe.

Andy was educated at Oxford University and received the D. Phil degree for his studies of impurities in semiconductors. He is the recipient of the Patterson Medal from the Institute of Physics, and the GEC Nelson Gold Medal and Prize. Andy's home base is at Oclaro's Caswell facility in the UK, where GaAs (Gallium Arsenide) and InP (Indium Phosphide) based devices are designed and fabricated.

EPIC Board Representatives (from left to right): Drew Nelson, President, IQE, Jean-François Coutris, Sagem, Martine Keim-Paray, EPIC, Tom Pearsall, Secretary General EPIC, Michael Heuken, Aixtron, Hans-Joachim Grallert, Heinrich-Hertz-Institut, and Andy Carter, Oclaro.

EPIC and Munich Network form a Strategic Cooperation

Contact:
www.munichnetwork.com
www.epic-assoc.com

Munich Network is an association of technology companies as well as an ecosystem of scientific research institutions, equity investors, financial service providers, consultancies and entrepreneurial personalities.

The Network links technology entrepreneurs with each other as well as with industry leaders, users, research and development organizations, investors exceeding regional and national borders. The Network provides platforms equipped with the best resources of experience, knowledge, ideas, talents and capital.

The Munich Network is open regarding technologies and industrial sectors and puts its main focus on the following two innovation areas:

Within the cleantech_net the Munich Network address Clean Technologies, the innovations for a sound climate, eco-friendly use of natural resources and sustainable economic activity.

With the mobile@all®-initiative they address the new opportunities in mobile communication paradigm shift.
The Munich Network operates in four business areas:

1. The Networks – for contacts and exchange of experiences and ideas
2. The Technology & Innovation Network – offers access to innovations-, industry- and capital
3. The Collaboration Network – for know-how and insights from experts
4. The Munich Network Conferences – for perspectives, market and technology trends.

EPIC and Munich Network have a few members in common. Robert Bosch is one example. EPIC will be working to support the Munich Network's programmes for venture funding of SMEs in sensors and communications.

...munich network__

EPIC visits members in Barcelona

Contact: www.epic-assoc.com

EPIC spent the first week of May, 2011 in Barcelona. We visited the Institute of Microelectronics (IMB-CNM) on the Campus of the Autonomous University of Barcelona in Bellaterra, about 50 km north of the city, the Institute of Photonic Sciences (ICFO) in Casteldefells to the south, and the University of Barcelona which is located in the center of the city next to the Barca football stadium.

Three out of the four current Nexpresso projects involve EPIC members in Barcelona, and the visit was an occasion to help accelerate progress. Discussions with Valerio Pruneri at ICFO were focused on the organization of next year's European Conference on Integrated Optics, which he is chairing. We talked with Silvia Carrasco and Rebeca Santamaria about adoption of a photonics prototype exchange programme.

EPIC was pleased to invite its members in Barcelona to a networking diner at the Vinateria del Call in the Barri Gótic quarter of old Barcelona.

- Pablo Loza-Alvárez, ICFO
  pablo.loza@icfo.es
- David Artigas, Univ. Politecnico de Catalunya
  david.artigas@icfo.es
- Adolf Canillas, Univ. Barcelona
  acanillas@ub.edu
- Carlos Dominguez Horna, Institute of Microelectronics of Barcelona
  carlos.dominguez@imb-cnm.csic.es
- Blas Garrido, Univ. Barcelona
  blas@el.ub.es
- Rio Howard
  howard.r@free.fr
- Andreu Llobera, Institute of Microelectronics of Barcelona
  andreu.llobera@imb-cnm.csic.es
- Tom Pearsall, EPIC
  pearsall@epic-assoc.com
- Rafael Porcar, Cosingo
  rporcar@cosingo.com

We emphasized the opportunities for networking, and the dinner was an opportunity for the people coming from ICFO which is south of Barcelona to meet the community from the IMB-CNM, located to the north.

The dinner conversation led to new cooperation between the scientists from ICFO and the IMB-CNM. Following the meeting, Prof. Blas Garrido (2nd from left) applied for membership of the University of Barcelona in EPIC.

Around the table from the left: Carlos Dominguez, IMB, Blas Garrido, U. Barcelona, Rio Howard, Pablo Loza, ICFO, Tom Pearsall, EPIC, David Artigas, ICFO, Rafael Porcar, Cosingo, and Adolf Canillas, U. Barcelona Andreu Llobera, IMB took the picture.

EPIC and SOA partner with Pacte-PME to host successful B-to-B meeting on Photonic Sensors

Contact:
www.photonic-sensors.eu
www.epic-assoc.com
www.pactepme.org

The Scottish Optoelectronics Association hosted a business-to-business meeting on Photonic Sensors for Sensing in Harsh Environments in Edinburgh UK on 24 March 2011. This highly successful event was the first edition of the Business Roundtable initiative, launched by EPIC in 2010.

The Business Roundtable networks technology innovators in photonic sensor technologies, typically SMEs with integrators who are skilled in the implementation of sensing systems in key application areas like defense, security, oil and gas exploration. The event is a showcase for selected, innovative European SMEs to present their expertise in the range of photonic sensors in harsh environments. The objective is to accelerate the development of mutually-beneficial business relationships.

Large accounts from the defense and energy industries are an attentive audience.

Photonic sensing in harsh environments includes both civilian and defence applications. Traditionally produced for air, marine and ground forces, photonic sensors are now diversified to civilian applications to meet stringent security requirements. Going even further, photonic sensors are now key technologies in oil and gas exploration. The “dual-use” philosophy is driving unprecedented innovation and growth in the photonics sensors sector.

Participation was based on a selection of applications from companies seeking to exploit new photonic sensor products and technologies. Twelve companies were invited to present: AIM Infrarot-Module, Astro and Feinwerk, e2v, Fiberlogix, Fibertronix, IDIL, iXFiber, M-squared lasers, Perm Research and Production Instruments, Sensroad, Smartfibres, and Xylophone Optics. Each company made a short presentation about its technology, its products and exploitation plans.

Large companies circulated summaries of needs and interests to the participants in advance of the meeting.

Networking discussions between SMEs and large companies (here Sagem and iXFiber) are a key component of the Business Roundtable event.

Attending were BP International, FMC Technologies, GDF-Suez, MBDA, Sagem, Selex-Galileo, Thales and, Total. SMEs on the average received 4 follow-up contacts for further discussions. EPIC will follow the business relationships that develop.

Through on-site polling of the large business integrators and planned networking session, the Round Table helps to create business relationships between photonics SMEs who are leaders in sensor innovations and technology integrators who are seeking specific capabilities and performance for sensing in harsh environments.

Subsequent Business Roundtable meetings are being planned for Tallinn, Estonia, Düsseldorf, Germany and Barcelona, Spain.

For further information on how to participate please contact Tom Pearsall Secretary-General:
Pearsall@epic-assoc.com

Laser World of Photonics sets Attendance Record—BMBF unveils its new R&D priorities

Organized by Messe Munich, the Laser World of Photonics Exposition and associated conferences had its 20th edition from 23 to 26 May at the Munich Trade Fair. With over 27 000 participants and 1 100 exhibitors, this biannual event has surpassed Photonics West as the world's largest photonics meeting.

From Günther Braun, CEO & President of EPIC-member Rofin-Sinar Technologies, "The LASER World of Photonics has again bolstered its position as the leading international trade fair in the photonics sector. This year it very clearly mirrors the market's upbeat mood".

The Laser Fair has continued to develop the number of conferences and workshops that complement the equipment trade show with a focus on "Lasers and Laser Systems for Production Engineering", "Green photonics" and "Biophotonics and Life Sciences". 3250 international participants attended the total of six conferences taking place during the World of Photonics Congress. In addition to scientific conferences organized by the EOS and the SPIE, other highlights were workshops on laser processing of photovoltaic modules, a market review and forecasting for industrial lasers. Dr. Peter Loosen, Deputy Head of EPIC-member Fraunhofer Institute for Laser Technology ILT said: "The combination of trade fair and congress here in Munich is unique in the world".

Twenty-seven EPIC member companies participated in the exhibition, including AlphaNov, ALSI International, Amplitude Systems, Eolite, EPIC, Exalos, Ficontec, Fraunhofer Institutes (HHI, ILT, IOF, IWS), Gooch & Housego, iXFiber, Imagine Optic, Innolume, Multitel, Multiwave Photonics, Oclaro, OneFive, Perfos, Quantel, Quebec Photonic Network, Rofin Sinar Laser, SPI lasers, 3S Photonics, Time-Bandwidth Products, TNO, as well as new member Oxxius.

During the opening session, the BMBF (the German Minstry for Education and Research) presented its strategic agenda "Light and the Future" for the next R&D funding programme. The report emphasizes the Photonics advantage in six key growth markets:

1. **Photovoltaics In renewable energies**
   The global market share of German companies is about 20 percent across the whole value chain.
2. **Integrated photonic technology**
   Photonics today is at a level that is comparable to the transition from conventional electronics to microelectronics in the sixties of the last century.
3. **Photonics manufacturing tools**
   The capabilities of the German economy in the "production of productivity" are augmented by the application of photonic methods to achieve more flexible, efficient and integrated digital production.
4. **Medical research, prevention and treatment**
   Biophotonics opens a new frontier for analysis and treatment of disease.
5. **New laser sources, optics, materials**
   Germany to defend and develop its core technological competencies in photonics to strengthen the interplay between scientific and applied photonics research.
6. **Photonics communication networks**
   There will be an important component of the R&D program to support the potential of photonics to revolutionise the way we work, live and communicate

Details can be found in the summary document on the Optische Technologien site www.optischetechnologien.de, and the report "Licht mit Zukunft" can be downloaded at http://www.bmbf.de/pub/photonik_forschung_in_deutschland.pdf

The Laser World of Photonics Exhibition and Conferences took up 6 halls at the Messe Munich. This meeting was followed 2 weeks later by the 20th edition of InterSolar EU, which is more than 2x as large. This exhibition occupies 168 000 m^2 of floor space up 20% from last year. 2 200 exhibitors and 75 000 visitors are expected.

The nine-o'clock rush as the gates are opened

Secretary-General Tom Pearsall at the stand for the LIFT Project

Igor Krestnikov of Innolume

Martine Weinacht and Alexis Liagre of Edmund Optics

EPIC members meet in Paris for the Annual General Assembly

EPIC's Annual meeting took place in Paris on April 4-5. Video clip recordings were scheduled during the 4th of April for Amplitude Systèmes and Yenista Optics. The finished product can be viewed on the EPIC home page where they are running in rotation with previously recorded video clips and on the EPIC Photonics channel (http://www.youtube.com/user/EPICphotonics).

The gala dinner with over 40 members and guests took place at the Maison des Arts et Métiers on the evening of the 4th during which the membership had the opportunity to thank the out-going President, Jean-François Coutris for his leadership and service to EPIC during the last four years. Tom Pearsall presented Jean-François with a certificate of appreciation, and a bottle of Armagnac that was made in the year of his birth.

Jean-Francois Coutris, out-going President and Florence Coutris, guests of honor at the Gala dinner.

Tom Pearsall also introduced attending members to Drew Nelson, the newly-elected President of EPIC. Drew talked about his enthusiasm and aspirations for EPIC during his term. The unifying theme is to strengthen the relevance and impact of EPIC among the photonics business community in Europe and around the world. In 2011, Drew emphasized some important strategic actions:

- Help to build the Common Strategic Framework (http://ec.europa.eu/research/csfri/index_en.cfm)
- REACH is the European Community Regulation on chemicals and their safe use. EPIC supports this initiative (http://echa.europa.eu/reach_en.asp)
- EPIC has proven its ability to organise R&D projects. EPIC should be equally successful at building business for its members, by it contribution to better conditions for building business and by helping to build bilateral business deals. We will continue our offering of market and technology updates, and custom business services to EPIC members.
- The strength of EPIC as force for photonics depends on both its size and also on its strategic focus of its membership. EPIC will execute a value-chain analysis on the six principal sectors where we operate (Communications, Lasers, Lighting, Sensors, Components and Photovoltaics).
- During the next year, EPIC will recruit a new Secretary General to lead EPIC into its 10th year of operations and to chart new directions for EPIC as Europe's leading photonics industry association.

Drew Nelson, newly-elected President talked to the membership about his ambitions for EPIC

On the following day, EPIC organized networking sessions on Laser processing for Factories of the Future, Optical networking, and Photonic components with a particular view on the upcoming calls for proposals from the European Commission in December 2011 and January 2012.

Networking for Biophotonics cooperation.

Drew Nelson presided the General Assembly which convened in the afternoon. The accounts for 2010 were approved unanimously.

Out-going President Jean-François Coutris gave a review of accomplishments during 2010 and summarized the current situation and challenges for EPIC.

Major EPIC activities in 2010:

- The return on your investment in 2010: EPIC members were paid 2.2 million euros net for participation in European projects, representing a 11.4 times return on membership fees paid.
- Major market studies delivered to members: Photovoltaics, LEDs: Technology, Markets, Fab Database - an 11k euro package.
- Individualized services to members: a technology audit and strategic plan for photonics in Brittany.
- Organisation of a 750k euro Nexpresso project involving 8 EPIC members.
- Promoting EPIC members to the Photonics-21 Board of Stakeholders: Patrick Maine of Quantel was elected to the BoS. Twenty-seven out of 80 BoS members work for EPIC-member companies.
- Sensors and security: a new initiative that brings SME and big groups around the same table. First meeting on 24 March 2011 in Edinburgh.

23 EPIC member companies participated in 8 meetings organised by EPIC during the last year:

- EPIC OLED Summer School: Krutyn, Poland 22-28 June 2010
- Symposium on Optical Networking for Future Broadband Internet Services at ECOC 2010 Torino, 22 September 2010
- International Optoelectronics Association annual meeting in Taipei, Taiwan 5-8 June 2010
- 4 EPIC members on video: Paris, France 2 May 2010
- EPIC Symposium at FTTH Conference, Milan, Italy, 24-25 February 2011
- ForumLED Panel Discussion with Aixtron, Philips and Cree, Lyons, France 8 December 2010.

Breakthrough Events: The Business Roundtable takes off

- Create business relationships between photonics companies, leaders in sensor innovations and technology integrators who are seeking specific capabilities and performance for sensing in harsh environments.

EPIC: Where we are today	Challenges for tomorrow
Photonics-21 · EPIC Members created Photonics-21 · It has become an excellent resource · EPIC members represent 30% of the governing structure	**Challenges** · EPIC members work together to propose and support actions · Stronger participation in the governance · Balance P-21 with an industry/business organisation
EPIC membership · 80 corporate members and 400 individuals in the network · Increased participation of members working together in EU projects	**Challenges** · Increase corporate membership to 120 · Greater member visibility in Europe and abroad
Building Business · Invest in Photonics · Business Roundtable	**Challenges** · Organise and work together with photonics clusters · Presence all over Europe

EPIC 's Bellwether Company Performance for LED Solid-State Lighting

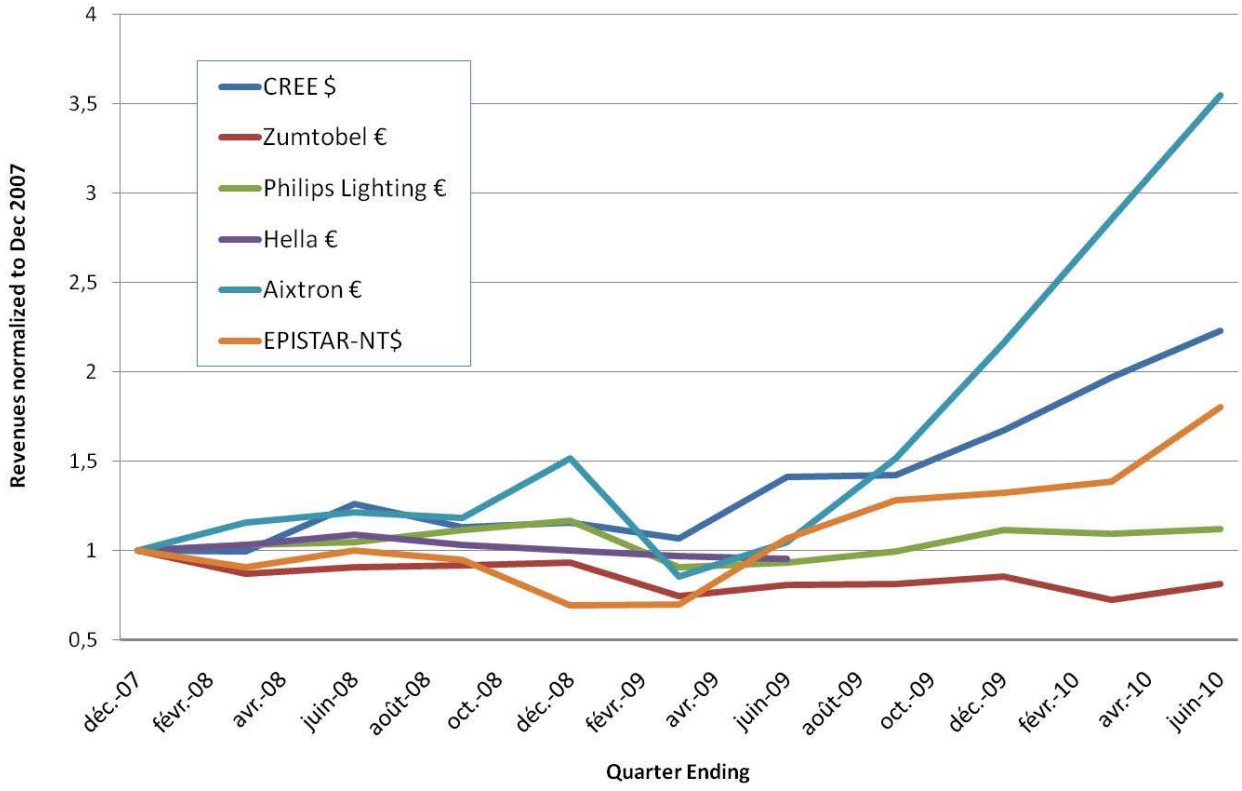
Contact: www.epic-assoc.com

EPIC has completed its Bellwether Study LED Solid State Lighting to include2010 annual results. The LED lighting industry has completed a strong year with significant growth in all parts of the value chain from materials growth through finished lighting systems. Overall, solid-state lighting grew by 28% over levels in 2009.

The major application in 2010 was LED-backlighting of LCD display screens. In this sector, the high-growth segment was backlighting of LCD television screens. Backlighting accounted for 35% of the $9million market volume in 2010. This represents an increase of about 300% over 2009 levels.

Manufacturers are ramping production to meet market demand through capital investment, through acquisitions, and through improvements in production quality that increase yield of in-spec components.
Among the 6 Bellwether companies, EPIC-member AIXTRON is successfully executing on a business plan to grow with the market. Revenues at the Aachen-based facility increased by 60% during the last year.

Philips' annual lighting revenues were $7.552 billion in 2010, of which 13% or about $1billion are contributed by sales of LED components, lamps and systems. LED -based sales increased by 37% on a year-by-year basis for the 4th quarter of 2010.This strong growth is not yet reflected in the Bellwether performance curves which cover the entire lighting portfolio of products.



The Bellwether 6 for solid-state lighting.
AIXTRON (materials growth), EPISTAR (LED chips), CREE (LED modules), Philips, Zumtobel and Hella (Lighting systems and luminaires)

Electrical Power Installations more than Double in Europe

Contact: www.epic-assoc.com

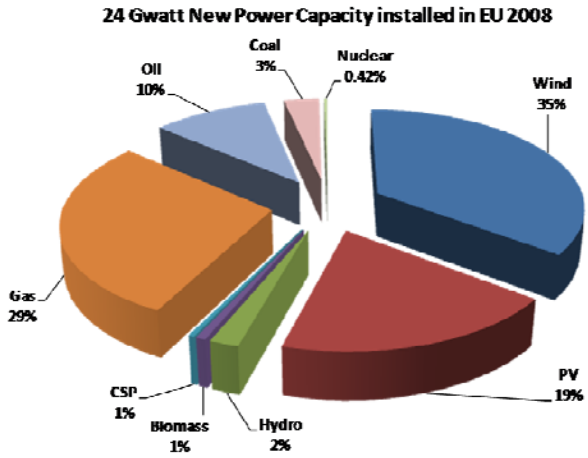
Installation of new electrical power generation capacity more than doubled between 2008 and 2010, according to the new 2010 Photovoltaic Annual Report, produced by EPIC.

In 2008, wind-power was the leading source of installed power account for 36% of the 24 Gwatts of power that was added to the EU electrical grid. Photovoltaics accounted for 4.7 Gwatts or 19% of the total. In 2008 about 60% of all installations were based on renewable energy generation.

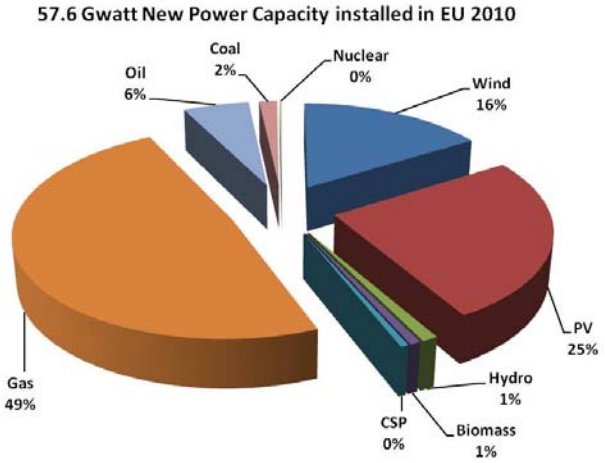
In 2010, Installations of new electrical power shot to a record 57.6 Gwatts, more than two times the total in 2008. Furthermore, practically one-half of these installations are classical thermal generation stations fuelled by natural gas. As a result, renewable energy sources accounted for only 45% of the total installations. Photovoltaic installations in Europe broke all records in 2010, with nearly 15 Gwatts installed. However, wind power has stalled with very modest growth during the past two years. As a result, installations of photovoltaic electrical power surpassed those wind installations for the very first time, by a margin of 60%.

Installations of other sources such as coal, oil, hydro and nuclear remain marginal with respect to the overall picture.

Tom Pearsall, Secretary General of EPIC commented "These are striking results, demonstrating that Europe is witnessing a dramatic revolution in the composition of its electrical power grid. The electrical power industry is responding to a need to both increase the volume of public power, and to retire aging plant and technologies from the grid at the same time. The changes are definitely not smooth evolutionary modifications, but reflect a rapidly changing vision of the power mix in the near future."



Renewable energy sources accounted for 60% of the total installations of new generation capacity on the EU electrical power grid in 2008.



Gas was King in 2010, but installation of photovoltaic power moved smartly into second position, well ahead of wind-power. Overall the place of renewable energy in the overall bouquet of installations dropped from 60% in 2008 to 45% in 2010.

Compound Semiconductor Week

The 38th International Symposium on Compound Semiconductors and the 23rd International Conference on Indium Phosphide and Related Materials were held in Berlin under the umbrella of "Compound Semiconductor Week 2011" on 22-26 May 2011. EPIC member Heinrich-Hertz Institute hosted the meeting and led the organisation.

The plenary session highlighted recent developments in compound semiconductor research. There were 33 invited talks and 180 contributed oral papers, plus 180 posters presented during the course of both conferences. A series of short courses offered a "deep dive" into the details of key applications technologies, such as VCSELs, HEMT design, high-speed photodetectors, etc.

Norbert Grote, Heinrich-Hertz Institute