PARALLEL SESSIONS CLUSTER 22@ BARCELONA

ENERGY CLUSTER

SPEAKERS:

Mark Romof, president and CEO, Ontario Centres of Excellence Inc.

Antoni Martínez, director of the Energy Park, b_TEC Foundation.

Francisco Torres, strategic project manager, ICAEN.

Moderator: **Josep Escolano**, director, the b_TEC Foundation.

Everyone is now aware that a new era of energy is drastically needed. The petroleum supply crisis, combined with concerns over climate change, is forcing the industry to seek alternatives. The search for greener and more stable energy sources should lead to more efficient energy. Over 100 people attended this afternoon session dedicated to the Energy Cluster, in hopes of learning more from the Canadian model at Ontario Centres of Excellence and from Barcelona's experience with the b_TEC Foundation Energy Park.

The Canadian perspective: How technological innovation can make energy companies more competitive

The Energy Cluster Session was fortunate enough to include the experiences of Ontario Centres of Excellence (OCE), whose president, Mark Romof, explained that its objective is to increase regional economic growth by creating new market opportunities and by commercialising leading discoveries or technologies. Hence, one of its priorities is to stimulate technology transfer among the different players involved in innovation, with the hope of providing talented individuals with professional opportunities.

Romof explained that in Canada, innovation is considered a critical component of economic prosperity that directly translates to higher productivity but which also provides better quality of life for individuals. "Our basic pillars comprise innovation, the creation of intellectual property, and the development and subsequent commercialisation of new technologies," he said.

For the dynamics of prosperity highlighted by Romof, the first challenge is to establish a culture of innovation. "There are many people who do not understand what innovation is; they do not understand the impact that it has on their daily lives, nor do they even grasp the relationship between innovation and economic prosperity in general," he said. Therefore, Canada has made massive efforts to create a culture based on this value. As underscored by Romof, this change of mentality had to start from the top, through strong political leadership that could develop and execute an effective strategy.

The experience of Ontario is very meaningful. Romof explained that the political leader of the Province established innovation as a cornerstone of its economic policy early on. Upon being

elected four years ago, he established the new Ministry for Research & Innovation, which helped innovation progress at all levels. He combined all of the resources dedicated to research & innovation in a single department and named himself minister of the new body. “This sent a strong message to other members of the cabinet, who saw that their own leader believed in this value, and it had a strong effect on them. He then travelled around the world searching for the individuals who were most qualified in terms of strategy and innovation, and brought them to Ontario so that they could direct the new ministry and carry out its programmes.”

Romof said that the innovation process requires “a contact sport and a team sport”, among the various players involved. According to him, “You can not go it alone in this project. If you really want to develop and implement innovative strategies, then you have to collaborate with others.” One of the most delicate tasks is to getting the business world and academia to work together—“a link which is not formed naturally"—and then add to that "a good doses of administration" and investors working together.

“All of these different players have to sit down at the same table and shift from competition to collaboration. But this is much more difficult than it sounds, and in Canada we had to learn that personal interests and egos have no place in a collaborative environment,” he affirmed.

Despite being the second largest country in the world (after Russia), Canada has only 32 million inhabitants. Whilst energy demand in Canada has remained constant over the past few years, domestic energy production has surged due to exports to the United States. Indeed, Canada has become the main energy supplier of the United States. As Romof explained that, although clean coal technology is an interesting part of the energy scheme, Ontario has decided to forego this source all together and is planning to close all of its coal plants within a decade. “This is an extremely important decision, especially considering that Canada is one of the principal producers of coal." Therefore, Ontario must confront its energy needs through dependable innovations.

“We are leaving the coal market, and that is final. At the same time, our nuclear capacity has been on the decline, but it is now being reorganised thanks to a new programme aimed at strengthening nuclear energy as our main provider," said Romof. Likewise, we are continuing to expand the use of natural gas and hydroelectric energy, and should double our renewable energy sources over the next few years.” Energy efficiency will also play a key role in the future of Ontario.

The OCE

OCE was founded in 1987 to push the results of research high quality research from the laboratory into the market. Romof explained that it is a non-profit corporation financed in great part by the government, but which retains “totally independent”.

“Getting someone to fund you, who at the same time will leave you alone, is a marvellous agreement.”

The OCE works in two specific areas. The first is facilitating the transfer of technology from laboratories and research centres to the market. Romof explained his company’s philosophy: “We go to companies to determine their demands, and then go to universities to identify who is best suited in that area of research, and we put them in contact with one another.”

Hence, the OCE has a team dedicated exclusively to studying what type of research is being done and where. “We finance the most interesting projects, and then identify a company that could be interested in the technology, which we transfer through an agreement.” He

emphasised that "OCE is not interested in intellectual property, nor in earning royalties from the intellectual property derived from the research that we finance".

The second working area of OCE is training a new generation of innovators, entrepreneurs, researchers and business leaders, and providing these individuals with professional opportunities. "We aim to preserve the products and new technologies that we develop, but also the new innovation professionals that we train; at the same time, we try to steal the best talent possible from the rest of the world."

"One of the most effective ways of transferring technology is to transfer the people who had worked on the technology. To do this, we try to include a position for a student in every research project that we fund. This is good for students, but also for the company that acquires and commercialises the technology, because they end up hiring young students who had worked on the project." The OCE is reinforcing these efforts with a new programme focused on increasing hiring of students. It allows companies to share the cost of a student's salary during his/her first year of employment.

For more information, see: http//:www.oce-ontario.org/

The Barcelona perspective: the b_TEC Foundation Energy Park

The b_TEC Foundation, a science and technology centre based on the principles of sustainability, internationalisation, and interaction with its surroundings, works in divulgation and entrepreneurship. Its president, Antonio Martínez, explained that the Foundation, located at the end of Diagonal Avenue and integrated harmoniously into 22@, brings together companies, universities and the public administration to work on three knowledge areas: energy, water and mobility. "We seek interaction with our surroundings, to be linked; we do not want to be isolated. Our presence should enrich the neighbourhood and vice versa."

In terms of academic research, b_TEC is constructing a major campus with the collaboration of local universities. It is currently finalising the architectural designs for the first building and planning the second one. "It is going to be an inter-university space in which, apart from UPC, we will be collaborating with UB, specifically, with energy research groups," explained Martínez.

In terms of companies, b_TEC is fomenting the creation of business clusters aimed at increasing competitiveness through technological innovation. As such, it wants to assemble companies or business units of companies dedicated to innovative projects for the energy, water or mobility sectors. The Energy Park, b_TEC's project for the energy sector, will contain engineering schools, an energy research centre, a cluster of energy efficiency companies, the European agency Fusion for Energy, and will host the Tech Summer Session, among other research projects.

Martínez explained that the Park will have a new engineering campus in Barcelona which will grant market-oriented masters and doctoral degrees. "There is a desire for energy to be a major stimulating element here, and we are even considering offering a specialised degree in the field," he mentioned.

The Catalan Energy Research Institute (*Institut de Recerca d'Energia de Catalunya*) is one of the principal energy technology initiatives for the near future. The Institute is under construction, and should be completed by the end of the first quarter of 2008. "The Institute will have its headquarters here, but will encompass another centre, which will probably be located in Tarragona," said Martínez.

The Institute's research in technology development is focused on energy efficiency technologies, which are constantly becoming obsolete with time. Martínez indicated that they will pursue other areas of research, such as those associated with intelligent power grids; marine wind energy; biocombustibles; and CO_2 capture; as well as two major areas for the future: advanced materials for energy and high-power electronics.

Martínez also explained that b_TEC has signed an agreement with the Massachusetts Institute of Technology (MIT) to work on research projects and technology in thermoelectric solar energy and marine wind energy, both considered critical to Spain's development of renewable energy sources.

Furthermore, b_TEC will host the headquarters of the European Fusion Agency, an office for developing specifications and orders for approximately 50% of the new Iter reactor (slated for completion in 2012). "This is a golden opportunity for Spanish and Catalan industry to have access to those contracts," added Martínez.

He also mentioned that b_TEC will host a cluster for efficient energy businesses, a project stimulated by the Catalan Energy Institute (*Institut Català d'Energia; ICAEN*) and the Foundation itself to increase value in the sector.

Lastly, he announced that it will host the 3rd annual Tech Summer Sessions, an international symposium geared to anyone with an interest in energy. The event will include an international seminar from MIT, sessions dedicated to technical seminars, and a course on renewable energy sources.

For more information, see: http//: www.btec.org/

The Catalan Efficient Energy Business Cluster

Francisco Torres, strategic project manager at ICAEN, spoke on the strong growth and potential of the efficient energy sector, and spoke on the related cluster which will soon be built at b_TEC.

The world is currently facing the challenge of overcoming its massive dependence on fossil fuels by investing in specific knowledge and technology initiatives for energy efficiency. "This is leading to new demands and an incredibly important market and is encouraging Catalan companies to jump aboard," he stated.

Energy efficiency has become a hot topic, owing to the environmental impact of energy consumption as well as to predictions of a future in which resources are scarce. Torres underscored that the International Energy Agency (IEA) has announced that the petroleum supply crisis could become a reality as early as 2015. "We do not have much time to act on energy efficiency; we have to be urgent about this right now," he affirmed. One of the four pillars that the Catalan Energy Plan is based on is dedicated to energy efficiency, and also affects plans for renewable energy sources and R&D programmes.

Torres explained that one of the strategies in the Plan is to stimulate the market by encouraging demand for efficient-energy solutions. "For years, energy efficiency was not an important factor for consumers, leading to weak product development and market presence in this area of technology—an area which could be strengthened and stimulated by a group or cluster," he affirmed.

ICAEN and b_TEC are both promoting such a cluster for energy efficiency, which they hope will draw companies from diverse sectors. Torres explained that in contrast to clusters based on a mature and consolidated market, “in this case the driving force that we are proposing to bring companies together is not so much a product as it is a quality of a product—energy efficiency, which is relative. A product is more efficient than another if it has better specific consumption or more positive energy intensity than the other. This is a relative value with an evolving basis; hence, the competitive advantage of the product must be constantly developed.”

Whilst the product is only in its initial design and planning phases, which could take up to six months, they hope to assemble the Cluster informally by the end of this year, opening it up to all of the companies in the sector. The Cluster will encompass four working areas: collaborative innovation, group business capture, communication with public bodies, and boosting its own prestige.

Debate

The afternoon session dedicated to the Energy Cluster closed with a Q&A round. Representatives from Circutor, the Empte group, and Copcisca, three companies that are already participating in the Cluster, expressed their support for the initiative.

Mark Romof reiterated his defence of the decision to close coal plants in Ontario and said that he was in favour of continuing with the nuclear energy programme. “If we close one source, then clearly we have to find other resources. Ontario has major energy needs that will only continue to increase, and our long history of nuclear energy has functioned without problems. The public actually agrees with this energy source, and our decision to close coal plants is specifically for environmental reasons," he said.

Josep Escolano, director of the b_TEC Foundation and moderator of the Session, explained that the R&D projects undertaken at the new Cluster are being carried out on the campus itself, with support from university departments and the Catalan Energy Research Centre (*Centre de Recerca d’Energia de Catalunya*), which will focus on energy efficiency areas. “Growing the Institute and the Cluster at the same time is a way of exposing the people that do the research to the market and to business opportunities,” he affirmed.

KEY IDEAS

Mark Romof, president and CEO, Ontario Centres of Excellence Inc.

-The first step is to establish a culture of innovation
“A culture of innovation must be developed among the public. This change of mentality had to start from the top, through strong political leadership that could develop and execute an effective strategy.

-The innovation process requires “a contact sport and a team sport” among the various players involved
“If you really want to develop and implement innovative strategies, then you have to collaborate with others. One of the most delicate tasks is to getting the business world and academia to work together to move from competition to collaboration.”

-We work to train *and* retain talented individuals
"The OCE is training a new generation of innovators, entrepreneurs, researchers and business leaders, and providing these individuals with professional opportunities. We aim to preserve the products and new technologies that we develop, but also the new innovation professionals that we train; at the same time, we try to steal the best talent possible from the rest of the world."

Antoni Martínez, director of the Energy Park, b_TEC Foundation.

- "b_TEC: a new science and technology space that will combine the elements of the triple helix".
"b_TEC Foundation is a science and technology centre that works in divulgation and entrepreneurship. The Foundation, located at the end of Diagonal Avenue and integrated harmoniously into 22@, brings together companies, universities and the public administration to work on three knowledge areas: energy, water and mobility."

- The Energy Park will offer new, market-oriented degrees
"The Energy Park will have a new engineering campus in Barcelona which will grant market-oriented masters and doctoral degrees. There is a desire for energy to be a major stimulating element here, and we are even considering offering a specialised degree in the field."

-The new Catalan Energy Research Institute will be a cornerstone of the future
"The Catalan Energy Research Institute (*Institut de Recerca d'Energia de Catalunya*) is one of the principal energy technology initiatives for the near future. It is currently under construction and should be completed by the end of the first quarter of 2008. The Institute will have its headquarters here, but will encompass another centre, which will probably be located in Tarragona."

Francisco Torres, strategic project manager, ICAEN.

- Energy efficiency: a new focal point for development
"Energy efficiency will be a cornerstone of future development. The challenge is overcome our massive dependence on fossil fuels by investing in specific knowledge and technology initiatives for energy efficiency. This is leading to new demands and an incredibly important market."

- The Energy Plan incorporates an energy efficiency strategy
"For years, energy efficiency was not an important factor for consumers. This led to weak product development and market presence for this area. The Plan aims to stimulate the market by encouraging demand for efficient-energy solutions. One of the four pillars that the Catalan Energy Plan is based on is dedicated specifically to energy efficiency, and also affects plans for renewable energy sources and R&D programmes".

-The new Energy Efficiency Cluster: a world of possibilities
The future Energy Efficiency Cluster will attract companies who want to enter this market. Whilst the Cluster is only in its initial design and planning phases, which could take up to six months, they hope to assemble it informally by the end of this year.

KEY IDEAS FROM THE DEBATE

Albert Cot, Empte group (member company of the b_TEC Energy Efficiency Cluster).
- In the face of scarce resources and ever increasing prices, innovation is fundamental for the future. Hence, we must turn to renewable energy sources as a way of saving money."

Mark Romof, president and CEO, Ontario Centres of Excellence Inc.
- "Ontario's nuclear energy programme has a long history of functioning without problems. The public actually agrees with this energy source, and are not very concerned about the environmental aspect. In contrast, we are closing coal plants specifically for environmental reasons."

Josep Escolano, director, the b_TEC Foundation.
- "We intend for the R&D projects undertaken at the new Cluster to be carried out on the campus itself, with support from university departments and the Catalan Energy Research Centre (*Centre de Recerca d'Energia de Catalunya*), which will focus on energy efficiency areas. Growing the Institute and the Cluster at the same time is a way of exposing the people that do the research to the market and to business opportunities."