

**House Committee Examines R&D
Plans for Nuclear Energy**<http://nuclear.gov/pdfFiles/>[NuclearEnergy_Roadmap_Final.pdf](http://nuclear.gov/pdfFiles/NuclearEnergy_Roadmap_Final.pdf)

The U.S. House Representatives Committee on Science and Technology held a hearing in May to examine research and development (R&D) options to advance clean and affordable nuclear energy technology. The Department of Energy (DOE) recently released its *Nuclear Energy Research and Development Roadmap* which provides an outline of the Administration's nuclear innovation strategy.

Committee Chair Bart Gordon (D-Tenn.) said, "I believe nuclear power is a part of the solution to the challenges of energy independence and climate change. Our 104 commercial reactors today produce 20% of our electricity and 70% of our emissions-free energy and have run with a strong record of safety and operating efficiency."

The hearing was held to consider issues such as the safety and economic viability of nuclear power, the management of nuclear waste, the advancement of reactor designs, and the plans to minimize risk of proliferation of nuclear materials.

The DOE report concludes that "[t]he capital cost of new large plants is high and can challenge the ability of electric utilities to deploy new nuclear power plants." Members and witnesses discussed the role that Small Modular Reactors (SMRs) can play in reducing capital costs and improving the safety of nuclear power. SMRs are smaller than conventional reactors and have the potential to achieve lower nuclear proliferation risks and more simplified construction.

"I appreciated hearing from Department of Energy Assistant Secretary Warren Miller on the Department's nuclear energy research, development, and demonstration projects. As America tries to reduce its dependence on foreign oil, we can't neglect looking at nuclear energy options. I support the DOE's efforts to study alternative energy and develop next-generation plants, especially the creation of a dedicated Small Modular Reactor program," said Energy and Environment Subcommittee Chair Brian Baird (D-Wash.).

One of the main drawbacks of nuclear energy is the creation of nuclear waste. The DOE Roadmap identifies various potential strategies for waste management. Mark Peters, Deputy Director for Programs at Argonne National Laboratory, testified about the Administration's strategy for waste management as well as the new waste management technologies currently under development at Argonne. These include, "using advanced modeling and

simulation coupled with experiments to optimize the design and operation of separations equipment; exploring an innovative one-step extraction process for americium and curium, radionuclides that are major contributors to nuclear waste toxicity, to reduce the cost of used-fuel treatment; further developing pyrochemical processes for used fuel treatment—these processes enable the use of compact equipment and facilities, treatment of used fuel shortly after discharge from a reactor, and reduction of secondary waste generation; and developing highly durable and leach-resistant waste forms of metal, glass, and ceramic composition for safe, long-term disposal."

Members and witnesses also discussed a list of research initiatives outlined in the Roadmap that will explore how to extend the life of the current fleet of reactors and how to increase their safety and efficiency. While nuclear power currently accounts for 20% of all electricity consumed in the United States, the plants supplying that energy are nearing retirement age.

Another topic discussed at the hearing was ensuring that the benefits of nuclear power can be obtained in a way that limits nuclear proliferation. DOE has recommended a strategy to better account for and understand proliferation risks. Members and witnesses examined ways to mitigate and manage the threat of nuclear power being used by foreign entities for weapons applications.

**Finnish Nanotechnology Takes
Giant Strides in Five Years**www.tekes.fi/en/finnano

Nanotechnology is already a part of the everyday operations of over 200 Finnish companies, and it is estimated that nanotechnology will generate turnover of €1.2 billion in 2013. Boosted by the FinNano program, an internationally significant nanotechnology cluster has been created in Finland in five years. FinNano is a program of the Academy of Finland and Tekes, the Finnish Funding Agency for Technology and Innovation.

Finland has invested in the development of nanotechnology since the 1990s, with the development significantly picking up pace in 2005 when the FinNano program, which is now being brought to a close, was launched. The program accelerated development and set industrial activities in the field on a trajectory of rapid growth.

"During the period of the FinNano program, the number of companies in the field has more than tripled and there are currently over 200 companies in Finland utilizing nanotechnology. After years of focused work, we have moved on from the

development of nanotechnology to its commercialization," said Pekka Koponen, CEO of Spinverse Ltd., which has studied the effects of nanotechnology in the Finnish business community.

The trailblazing innovations in Finnish nanotechnology include carbon nanomaterials, and nanobuds—a new composite material discovered by Esko Kauppinen and his research group in Aalto University, Finland. Applications for these materials cover the spectrum from sports equipment to batteries, solar cells, touchscreens, and construction materials. According to Tekes, an internationally successful and growing competence cluster of companies and research institutes has grown around atomic layer deposition, a thin-film technology developed by Beneq Oy, a nanotechnology company in Finland.

The strength of the Finnish nanotechnology industry is based on cooperation and goal-oriented research. In the FinNano program, over 100 key decision-makers in Finnish corporate and research communities defined the guidelines for the development of nanotechnology for the needs of information and communications technology, forest, metal, and chemical industries, as well as nanobiotechnology. The leading industrial enterprises have recognized the significance of nanotechnology for their competitiveness and strongly invested in its development.

"In the current conditions, Finnish industry has to find ways to reinvent itself, and nanotechnology is a key enabler in this renewal. A good example is nano pulp. When pulp is refined to nanofibers, it can be used in countless different applications and products," said Markku Lämsä, Manager of Tekes' FinNano program.

In terms of euros, Finland is not a large investor in nanotechnology, but the investments in the field have been made at the right time and allocated to the right targets, according to Tekes. In 2005–2010, the FinNano program has funded the development of Finnish nanotechnology with approximately €70 million, of which €47 million is Tekes funding. The growth of industrial operations in the field is demonstrated by the fact that in 2008 companies' own development investments in nanotechnology exceeded public investments in the field.

Finnish competence has also raised interest abroad. In 2007, the FinNano program launched research cooperation with the Chinese Ministry of Science and Technology (MOST). According to Tekes, Finland was the first European Union country to start bilateral cooperation with China in the field of nanotechnology. Development cooperation in the field of

nanotechnology was also commenced, at the initiative of FinNano, between the Ministry of Employment and the Economy and Rusnano, the Russian state-owned nanotechnology development company.

India Fosters a Culture of Innovation

www.ideas.economicstimes.com

India's Department of Science and Technology (DST) is offering guaranteed funds for the "Power of Ideas" initiative. The initiative, launched on June 22, is India's largest entrepreneurial platform that encourages, nurtures, and grooms business ideas by connecting them with relevant mentors, incubators, and investors. This unique public-private-academia partnership means there is real money and real expertise powering The Power of Ideas 2010.

The Power of Ideas was first launched by the publication *The Economic Times* in 2009, in the middle of a global economic slowdown, to encourage the corporate sector of India to approach the slowdown creatively. Over 12,500 business ideas were received and of these, 1000 shortlisted participants were taken through group mentoring sessions and sessions on giving elevator pitches. A final list of 254 thus arrived at were put through a phase of one-on-one mentoring prior to presenting their ideas to investors. To date, nearly 20 ideas have received funding and several more are in advanced stages of talks with investors. This year, the objective is to formalize the initiative, transforming it into an entrepreneurial ecosystem that will drive the economy forward.

Working together will be the Center for Innovation, Incubation and Entrepreneurship (CIIE), Indian Institute of Management (IIM), Ahmedabad. Started as an incubating laboratory of IIM Ahmedabad, CIIE is currently a domain expert, with experience in mentoring, hand-holding, and making entrepreneurs investor-ready. In the last few months, CIIE has been sewing together a system comprising of mentors and investors who will evaluate every business summary that comes to The Power of Ideas 2010. To ensure that more dreamers get to meet investors, CIIE has also worked out a unique 10-day incubation program at its campus for all candidates who make it to the final cut-off list of The Power of Ideas.

Details of the program structure include a Discussion Board for like-minded people to come together and exchange ideas (ideasXchange); a Learning Center featuring select literature on entrepreneurial

issues and a comprehensive directory featuring contact details of the who's who of the entrepreneurial system; and an Essential Toolkit—a single window to access everything one needs to know about the basics of starting up a company—including government policies, applying for patents, registering one's company, making an elevator pitch, and the ideal business plan.

Philippines Announces Technology Transfer Act

In the Philippines, a proposed bill that seeks to roll out mature and potentially important technologies generated by government-funded research to the market was finally enacted into law recently after almost three years in legislation.

President Gloria Macapagal-Arroyo signed Republic Act 10055, otherwise known as "An Act Providing the Framework and Support System for the Ownership, Management, Use, and Commercialization of Intellectual Property Generated from Research and Development Funded by Government and for Other Purposes" or the "Philippine Technology Transfer Act of 2009" into a full-fledged national statute on March 23 at the Malacañan Palace. The new law is expected to serve as the blueprint for a nationally coordinated technology transfer framework of government-funded research.

Department of Science and Technology (DOST) Secretary Estrella Alabastro said that the science community is overwhelmed with this development.

"We are optimistic that this new law, a landmark policy on technology transfer, will revolutionize the commercialization of technologies generated by researches funded by taxpayer's money," Alabastro said.

The enactment came after Congress approved in December 2009 the Senate version, Senate Bill 3416, authored by Sen. Edgardo J. Angara and co-authored by Senators Manuel Roxas II and Loren Legarda. Senators Pia Cayetano, Gregorio Honasan, Panfilo Lacson, Aquilino Pimentel, Jinggoy Estrada, and Juan Miguel Zubiri also served as co-sponsors.

At the House of Representatives, Cavite 1st District Rep. Joseph Emilio A. Abaya was at the forefront of the Bill's passage and served as its principal author. Angara and Abaya chair the Committees on Science and Technology at the Senate and House of Representatives, respectively.

Speaking at the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development

(PCARRD) recently, Alabastro expressed optimism of the law's merit in uptaking technologies to the market as well as preventing brain drain of science and technology professionals, and encouraging students to pursue research and development studies.

A key provision in the law provides for incentives to researchers by according them share in the royalties as well as allowing them to develop their own start-up companies.

The law was Alabastro's brainchild, having recognized the need for a national backbone and framework that would push technology generation and application to its maximum potential through efficient and coordinated transfer capability and intellectual property assertions around the country, similar to the Bayh-Dole Act in the United States.

Alabastro explained that taking advantage of the new law would hasten the process of technology commercialization and broadens the scope of protection of intellectual property rights in government research and development institutions.

"For the longest time, we rely mostly on breakthroughs from outside, while our local technologies generated through public funds remain untapped or archived in laboratories around the country. Hence, this is a significant break for us to roll this out to the market and be availed by the public," she said.

Once fully in place, the new law is expected to provide the mechanism to allow important technologies to be commercialized and be made available to the public.

Patricio S. Faylon, PCARRD Executive Director, meanwhile expressed elation with this development. He described this as a leap for the inter-agency policy advocacy collaboration and a feat in the Council's policy development and advocacy mandate relating to science and technology development.

PCARRD, the central planning council of DOST in the agriculture, forestry and natural resources has led the Department's efforts in the Bill's legislative advocacy and public awareness activities since 2006.

Meanwhile, the technical and financial support given by the Intellectual Property Office (IPO) of the Philippines, DOST Planning and Evaluation Service, and DOST councils and institutes were instrumental in the legislative advocacy of the law. Currently, DOST and IPO are preparing the basis for the Act's implementing rules and regulation.

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