



Republic of the Philippines
CONGRESSIONAL COMMISSION ON SCIENCE & TECHNOLOGY & ENGINEERING
(COMSTE)



Recommendations of the Expert Panels

Congressional Commission on Science,
Technology and Engineering

As reported during the

COMSTE en-banc meeting

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More information is available at the COMSTE website at

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FOOD AND AGRICULTURE

Panel Chair: Dr. William Padolina.

The food and agriculture panel feels that food safety, competitiveness and security through R&D efforts should be our emphasis.

They have also taken into account trends such as the increased appreciation of developed countries for tropical fruits, and also the large untapped Filipino diaspora markets abroad.

Their main recommendations are as follows:

1) To concentrate on R&D that improves our productivity and competitiveness via public-private partnerships that will link R&D, financing, marketing, infrastructure, institutions and human resources, and share the investments in R&D. An “alert system” is proposed to be set up so that market requirements and standards (market intelligence) shall be immediately relayed to the public-private sector, and vice versa. It also ensures that R&D can quickly be commercialized, as there is alignment with the needs of the private sector even at the inception phase. Some examples of these are the China Consulting Association, the Malaysia Palm Oil Board, and the ATSE Crawford Fund. The panel is proposing an endowment of PHP5bn, to provide for MOOE, capital purchase, R&D, etc.

2) To concentrate on product niches, such as: new food products and boutique food products, marine products, tropical fruits, seasonal produce, traditional exports. For example, R&D can be targeted to breeding or selecting new varieties to respond to the global consumer trend of food/health interphase such as fruits and vegetables and marine products which have superior eating and nutritive qualities.

3) To target new export markets in Asia and the Middle East. It is the panel’s view that developing our niche in the export markets will actually improve our domestic product capability because the technologies we require to successfully compete in the export markets, such as superior elite varieties, postharvest and packaging technologies will spillover into our domestic food products.

4) And for its R&D recommendations, the following are the suggestions: a) to improve the agriculture and food database by using more reliable validation technologies such as remote sensing to accurately measure cropping regimes in real time b) improve our market intelligence capability, c) increase the number of product testing and analysis laboratories, d) establish regional packaging centers, e) improve food engineering and

post harvest processing capabilities , f) increase R&D budgets and allocate financing for bio-ventures, g) and finally, as agriculture is a high risk business activity, to improve the legal environment for investment and entrepreneurship.

ENERGY AND ENVIRONMENT

Panel Chair: Dr. Francisco Viray

The Energy and Environment panel believes that we are looking at a world where we can no longer rely on a predominantly fossil fuel driven energy mix. The recent oil price shock, and the recent passage of the RE bill, are signals that we should look at a different energy landscape over the next few years, that includes wind, solar, micro-hydro, geothermal and biomass but also natural gas, nuclear, and clean coal.

Their recommendations are as follows:

1) To establish an Institute for Energy Planning and Policy Studies to make sense of all these new developments in energy and how our current laws and regulations need to adapt. For example, new provisions in the RE bill such as the Green Option, the Feed-In-Tariff, and technology developments such as the Smart Grid need to be examined, particularly in terms of our existing laws.

2) Another recommendation is to develop Energy R&D hubs, which are centers of excellence for particular technologies. These can be done by designating and strengthening current universities and centers of excellence in solar, wind, biomass, nuclear, coal, conservation and other energy technologies. These universities and R&D centers will have to be identified and strengthened. In cases where there is no existing center of excellence, we will recommend the setup of new ones.

3) Related to the establishment of these R&D hubs, we need to strengthen research in the development of renewables, particularly since the Renewable Energy bill is nearing passage into law. There are cross disciplinary areas of collaboration here. For example, this panel can collaborate with the Electronics sector to look at opportunities for developing and localizing RE systems. R&D in renewable energy can result in the creation of a clean technology industry and create new companies and jobs for our people. The panel believes that we need to look at the impact of massive interconnection of RE systems to the grid, or also non-grid RE applications.

4) We also need to intensify development of alternative fuels. In collaboration with the food and agriculture panel, we would like to tap the promise of biofuels and the full realization of the Biofuels Act without sacrificing our food security. Therefore research into areas like cellulosic biofuel, which are not made from food crops, and simulation studies of biofuel demand as well as accurate mapping of our arable lands through satellite maps need to be strengthened.

5) The panel believes that we cannot talk about clean energy and renewables without energy efficiency and conservation. We tend to think of energy efficiency and conservation only in terms of citizen volunteerism in turning off their coffeemakers when the pots are empty or adjusting their thermostats, but actually R&D in areas like smart appliances – or appliances that can be controlled by the utility, or are smart enough to shift into power saving mode, need to be studied. With energy conservation and efficiency research, both into encouraging citizen volunteerism and encouraging the development of smart appliances, we may be able to cut energy demand without sacrificing growth and reduce the demand for spinning reserves and new power plants.

6) Finally, the panel would like to recommend that we re-explore seriously the nuclear option and also clean coal technology. We realize that the nuclear option will entail a lot of public consultations and debate, but there are new developments in the nuclear industry that merit a reexamination of this technology. Clean coal on the other hand, promises to significantly cut emissions, but a major focus of R&D for clean coal should be in the massive containment of the carbon dioxide that it will still generate.

HEALTH SERVICES

Panel Chair: Dr. Ramon Arcadio,

The vision of the health panel is that by 2010, that the Philippines will be a nation empowered by research based knowledge, technologies and innovations in health.

Recent developments like the Chinese melamine milk contamination, and possibly a resurgence of tropical and regional diseases like Bird Flu, are the potential threats that we need to take into account when looking at R&D projects.

The health panel also has recommendations for the DoH, and other government agencies. But for R&D, their main recommendations are:

- 1) Passage of the Philippine National Health Research System (PNHRS) bill, that will impact the activities of the National Institutes of Health, and
- 2) The setup of a National Genome Center. This will help us for example in studying how to tap stem cell research for new cures. It will also be useful not just for health researchers but also for food and agriculture industry researchers,
- 3) The strengthening of the BFAD and to use it to put science into our herbal medicine industry, and
- 4) For all universities to set their priority R&D agenda for the top ten killer diseases in the country.

SEMICONDUCTOR AND ELECTRONICS

Panel Chair: Dr. Greg Tangonan

The vision of the semiconductor and electronics panel is to grow this \$31bn/year export industry already employing 460,000 people directly and move it up the value chain.

In light of the recent US subprime credit crunch, and recent reports that a lot of US tech companies are expecting lower earnings, we need to look at alternative markets for electronics and semiconductors, perhaps China, India, the region and even domestically.

The main panel recommendations are:

1) To setup a semi-government, semi-private applied R&D institute, modeled after Taiwan's famous R&D institute, the ITRI. The ITRI in Taiwan was responsible for Taiwan's spectacular growth, as it was the source of spinoffs that became multi-billion dollar companies like TSMC, UMC and others. ITRI is semi-government, semi-private but the government gives it R&D contracts, the private sector gives it R&D contracts, and it also derives revenue from licensing and sales of IP. It is run like a private corporation, and the researchers are paid well and get bonuses if the revenue for that year is good. Recently, we had the President of ITRI here, Dr. Johnsee Lee, and we hope to leverage this relationship with ITRI to possibly help us setup our own version.

2) To setup pre-competitive consortia in hot areas like 1) chip design, 2) green technologies like clean energy, and 3) bio-electronics. These consortia can be headquartered in the proposed Applied R&D institute. These pre-competitive consortia are formal linkages between academe, industry, government, investors and entrepreneurs, so we can deliberately nurture the creation of new high technology industries and jobs from our R&D efforts.

Similar pre-competitive consortiums abroad include the SEMATECH, where the US government collaborated with US chip companies like Intel, Texas Instruments, Motorola, etc. to be able to compete against Japanese chipmakers. Recently, the US chip industry collaborated with the US government and universities like UC Berkeley to produce extended ultraviolet lithography equipment for the next generation of semiconductors. We can work with countries like Taiwan, through the MECO, to help us with this.

The panel recommends the formation of three pre-competitive consortia.

The first is on the development of smart solar systems. The panel proposes to focus on the development of smart solar systems particularly for agriculture and isolated

communities. To do this, we need to stimulate a local market for Solar Energy Systems, by unleashing 5,000 solar photovoltaic systems over three years across the archipelago that provide lighting, edutainment, village centers, and clean water. Related to this, the panel is also proposing that the country setup five 15MW solar power systems throughout the Philippines. The Cagayan de Oro based CEPALCO is already planning to upgrade their 1MW solar power system to 14MW, so this is doable. These efforts in building a local solar industry will unleash Filipino creativity in solving real problems by making these systems work, develop local components and give employment to thousands of citizens in this new industry. To support this, we need a variety of financing options, like aid programs, microloans, etc. Just in the Ateneo for example, they have developed systems that extract water from air moisture.

The second pre-competitive consortia being proposed include one on biomedical applications for baranggay level medicine, to bring capabilities such as ECG, blood tests, urinalysis to the barrios for example. Other related projects include family medical databases to support public health initiatives, and telemedicine.

Finally, another consortia aims to design high performance chips in the Philippines, and coordinate the training to produce at least 150 chip designers annually through efforts like ERDT and linkages with Taiwan, for example.

IT and IT-ENABLED INDUSTRIES

Panel Chair: Joaquin Quintos

The main vision of the ICT panel is to grow this industry into a \$12-billion-a-year industry employing 1 million workers and capturing at least a 10% global market share. This can be done by concentrating on higher-value projects, and moving from simply doing services to doing more ICT products, specifically in terms of software and animation.

The context of the recent US credit/subprime mortgage crisis and recession might have to be taken into account in finalizing these recommendations, particularly if there is a weakening of US demand for outsourcing to Asia.

In general, here are the panel's recommendations:

1) The unification of our Science High School system, as we need to develop the source of our S&T workers from the high school level. One of the weaknesses of our ICT sector is our inability to ramp up our knowledge process outsourcing capabilities unless we have a large pool of S&T knowledge workers.

2) The panel wants to give companies incentives for training workers. We are looking at the expiration of the tax breaks given to BoI and PEZA companies. Instead of extending these incentives, why don't we modify them? For example, instead of just continuing the 100% tax holiday which are about to expire, we can extend 50%, but convert the other 50% to tax credits that the companies can earn if they spend it on worker skills training.

3) The panel would like to improve the climate for ICT entrepreneurs so that they will create ICT assets and intellectual property. Recommendations in this area include improving access to capital for animation and software companies, particularly capital in the sub \$1M range. Capital is available, but often the tranches are either too small or too large. We should tap the Development Bank of the Philippines and the Landbank of the Philippines to include this in their priorities, and allow the use of intellectual property and billing invoices as collateral for loans, since many of these technology startups do not have physical collateral like land or capital equipment.

The panel would like to concretize these through legislative action by recommending the following bills:

A) A "Fair Access to Capital Bill" which will provide access to affordable capital to the smaller software and animation firms, in order for them to grow their businesses.

B) A “Human Capital Development Bill” for incentivizing companies to invest in worker training, education and accreditation, to change incentives given to companies from simple blanket tax breaks to become incentives for training their workers.

C) The “National Science High School System Bill”, co-recommended with the SME panel; and, finally

D) the passage into law of Senate Bills 880 and 1180 on intellectual property and data privacy, possibly integrating these into one bill that covers issues significant to the ICT sector like cross-border transfer of data, accountability of data processors, misuse of personal data, and to ensure that these bills reflect the APEC Privacy Principle, rather than the more restrictive standards of the EU.

SCIENCE, MATH AND ENGINEERING EDUCATION

Panel Chair: Dr. Reynaldo Vea.

The vision of the SME panel is for the science and engineering education sector to support the growth of the nation's S&T industries, firms for job generation.

We are looking at what our neighbors are doing. Vietnam for example is investing heavily in generating more MS/PhD graduates.

The recommendations of the SME panel are as follows:

- 1) To legislate or fund a massive science and engineering MS and PhD program that approximates that of other countries. The ERDT and the National Science Complex could be among the vehicles for this program. Just to give you an idea of the stark difference in terms of the number of our PhD holders here vis-à-vis that abroad, in Japan there is 1 per 11,621, in the US there is 1 per 6,533, and in Germany, there is 1 per 3,316. Here in our country, we have only 941 students taking up their masters, and 164 students taking up their PhDs, as of CHED's 2008 data. So to compare with these countries, our PhD ratio would be 1 per 54,060, given our current population of 88.57 million..
- 2) Another recommendation of the SME panel is to convert the laboratory schools of the Colleges of Education of State Colleges and Universities to become science laboratory schools This is to help attract students to take up S&T related courses when they enter college.

Another related option would be to reinstate support for the LEADER program of the Department of Education towards eventually mandating the creation of at least one science section in all public schools. If we are espousing for developing a critical mass of quality feeders to S&T HRD capacity building at the higher end, this will help create a bigger pool of potential BS students in S&T and catalyze serious efforts of public schools to improve their S&M programs at the tail end of basic education which connects directly with tertiary education.

- 3) Another recommendation is to support the initiative for the Philippines to gain membership in the Washington Accord. Becoming a member of this accord renders the academic preparation and professional capability of our engineers recognized internationally. Thus, Filipino engineers can work and make their mark in other countries. The biggest hindrance to us becoming a member is that other countries decry the fact that we lack a year in our education duration; engineering education

abroad take 16 years, while we only take 15. Also, our accreditation bodies in the Philippines aren't independent of schools, when it should be.

4) Also, the panel feels we need to provide funding for competitiveness, innovation and Productivity studies in academe. This is to support a scientific approach towards improving the country's competitiveness.

ABOUT COMSTE

The bicameral Congressional Commission on Science, Technology and Engineering (COMSTE), was launched with the passage of Joint Resolution No. 1 of the Thirteenth Philippine Congress. It is chaired by Senator Edgardo Angara and Representative Joseph Abaya (1st District, Cavite). Other members include: Senators Pia Cayetano, Juan Ponce Enrile, Ramon Revilla, Aquilino Pimentel, and from the House, Representatives Juan Angara, Mariano Piamonte, Florencio Noel, and Magtangol Gunigundo.

In February 2008, the COMSTE appointed several key experts in academe, industry, government to be part of the COMSTE panels of experts. These panels and their members were formed to look at the following areas namely:

Technical Advisory Council

DoST Sec. Estrella Alabastro - Co-chairperson

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ABOUT THE COMSTE PANELS OF EXPERTS

Food and Agriculture Panel

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Ponciano Batugal, PhD

Raul Hernandez, PhD

Bartolome Lopus, PhD

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Energy and Environment Panel

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Science, Math & Engineering and Education Panel

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IT & IT Enabled Panel

Joaquin Quintos IV - Chairman

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Semiconductor & Electronics Panel

Gregory Tangonan, PhD - Chairman

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