Session 4 Examples of Public-Private Partnerships: In the Area of Nuclear Technology: Malaysian Experience

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International Conference on the IAEA Technical Cooperation Programme Sixty years and beyond Contributing to development

30 May–1 June 2017 Vienna, Austria #Atoms4Dev2017

NUCLEAR MALAYSIA (NM) CORE BUSINESS



CRP project on Application of radiation techniques in development of advanced packaging

PPP Approach Towards Commercialization of Nuclear Technology at Nuclear Malaysia

- Licensing of patent & royalty
- Incubator program (start-up company operated Nuklear Malaysia facility/plant/laboratory (e.g. tissue culture lab, GMP plant for radioisotope production, GMP hydrogel)
- Building/plant Rental
- Joint R&D & Pre-commercilization Project (Flagship/Technofund funded)
- Services Agreement (e.g. irradiation services, testing)
- Technical support and
- Consultation

Some PPP Project Undertaken by Nuclear Malaysia with Industry

Radiation Modified Starch Hydrogel Nuclear Malaysia & Rumbia Biotech





Ebeam crosslinking & Sterilization Process

- Licensing of starch hydrogel patent
- Incubator program
- Technical support and consultation



Scalding from hot water: complete healing after one month used of sago hydrogel



Products •8

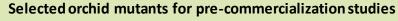
PPP Activities: technology transfer on plant tissue culture

Nuklear Malaysia - Hexagon Green: Commercial Production of Orchid Tissue Culture Seedlings Scopes;

- . Consultancy service on plant tissue culture and bioreactor technology for mass production of plant seedlings
- ii. Staff attachment/hands-on course on orchid propagation and maintenance in a commercial nursery
- iii. Mass propagation and pre-commercialization of orchid mutants for cut flower industry (MOSTI TF 0110C033)



Dendrobium Sonia Mutants





Keena Oval



Keena Radiant

Keena Ahmad Sobri





Keena Hieng



Keena Pearl





Keena Pastel

Lace



DS 35 1J



Ding

DS 35N

Nuklear Malaysia - Duta Nusa Jaya: Pre-commercialisation of LED lighting technology for Stevia plant tissue culture production (MOSTI TF0614D122)

Scope of collaboration:

- 1. Consultancy service on setting up a pre-commercial plant tissue culture production facility
- 2. Use of LED lighting & plant tissue culture technology for rapid plant production
- 3. Consultancy service on the micro propagation of selected stevia variant developed by Nuclear Malaysia
- 4. Mass propagation of stevia seedlings for large scale commercial plantation



Nuklear Malaysia – KOSAS : Large scale production of MD2 pineapple using bioreactor technology Scope of collaboration:

- 1. Consultancy service on the large scale production of MD2 pineapple using bioreactor technology
- 2. Hands-on training on the micro-propagation and transplanting of the MD2 pineapples in nursery and farm



OTHER PROJECTS



PrOlig<u>omer[®]</u>



OLIGOMER SACCHARIDES : PrOligomer^{*} is a natural water soluble product, non-toxic and an environmental friendly chitosan base foliar plant



growth promoter and elicitor

Research/product collaborator: NUKLEAR

PLANT PROMOTER & ELICITOR

Oligomer sachharide	>3%
Molecular weight	<15KDalton
Degree Acetylation pH	>70% >4 - 6
Form	Liquid

PRICE : RM40/LITER

Commercialization of Chitosan Oligomer as Plant Promoter/Elicitor

TLD Dosimeters for Radiation Workers in Malaysia Nuclear Malaysia & APM (1995 until now)



HIGH IMPACT PPP DEVELOPMENT PROGRAM FOR ENHANCING SAFETY OF AUTOMOTIVE AND BUILDING WIRE & CABLES USING ADVANCED MATERIAL AND GREEN TECHNOLOGY

PROGRAM AIMS:

Development of Radiation Crosslinked Cable and Radiation Crosslinked Flame Retardant (FR) for Automotive (including Hybrid and EV Cars) and Building Cable In Collaboration with PROTON Holding Berhad and Wonderful Ebeam Cable Sdn Bhd



WONDERFUL EBEAM CABLE SDN BHD

PLO 234, Jalan Tembaga Satu, Pasir Gudang Industrial Estate, 81700, Pasir Gudang, Johor.





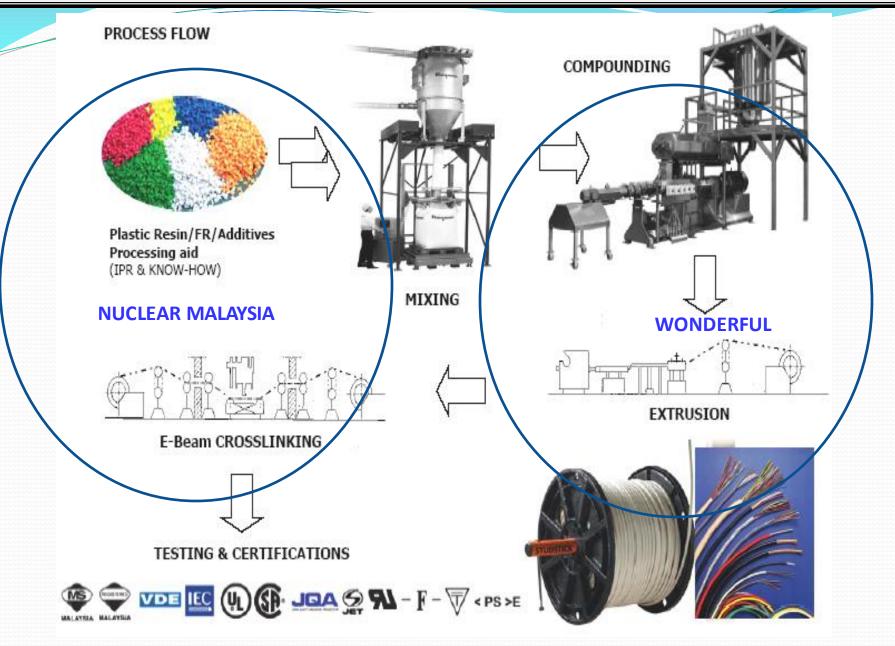
XLPE/SWA/PVC ARMOURED CABLES LENGTH COPPER CONSUMPTION XLPE/PVC SHEATHED CABLES 350 metric tons PVC/SWA/PVC ARMOURED CABLES PVC/INS & PVC/PVC CABLES PVC FLEXIBLE CABLES AND CORDS 350 metric tons PVC FLAT TWIN CABLES PVC AUTOMOBILE CABLES AV, AVS, AVSS, CAVS, AVX & AEX 150 metric tons 50,000 KM EB & HEB Type 15 metric tons **IGNITION CABLES** UL WIRES 15 metric tons 30~50 KM PVC APPLIANCE WIRES 11. COAXIAL CABLES SPEAKER CABLES 12. 30 metric tons 13. INTERNAL TELEPHONE CABLES 14. SCREENED/SHIELDED CABLES

Monthly Product Capacity

FR/Flame Testing

Worldwide We Connect...

SCOPE OF PPP: PRODUCTION PROCESSES FOR EB CROSSLINKED CABLE



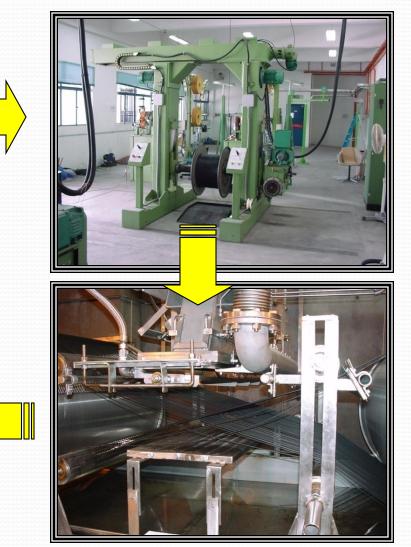
WONDERFUL EBEAM CABLE SDN. BHD.

ELECTRON BEAM (EB) PROCESS at NUCLEAR MALAYSIA— For Type AEX (PE Cross Link) & AVX (PVC Cross Link) Wires.





Worldwide We Connect...

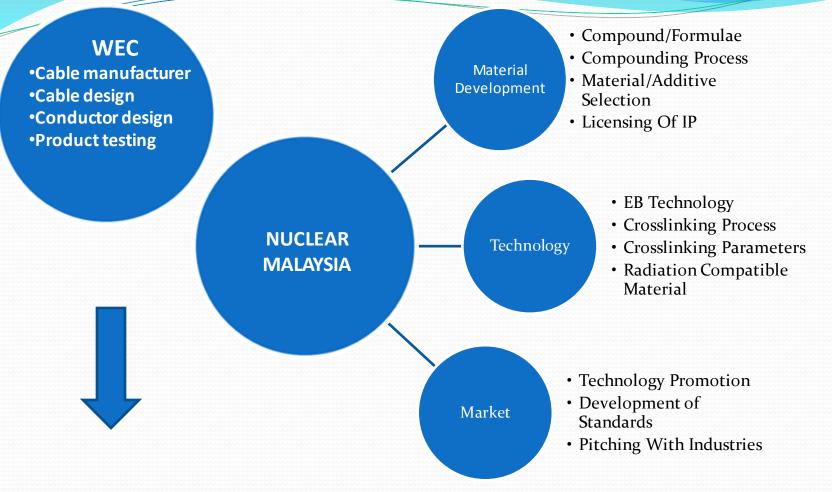


PARTNERSHIP SCOPE AND ARRANGEMENTS

- Technical support on material/compound
- Irradiation service contract
- PFI on ELV-4 accelerator
- Technical Agreement on High Impact (HIP) project in collaboration with PROTON (auto maker) & Wonderful Ebeam Cable
- Technical support and consultation in funding request
- Technical support on market reach and customer feedback
- Licensing of patent
- Development of standards and test methods



PPP WEC & NM TOWARDS K-ECONOMY



K-ECONOMY FOR SUSTAINABLE ECONOMIC DEVELOPMENT VIA STI

Country Needs :

✓ New technology

✓ New process

✓ New product



Why important?

Country Wealth :

- ✓ Crosslink cable
- ✓ Localization
- ✓ FOREX saving

CHALLENGES AND LESSONS LEARNED

- Convincing local technology is as good as imported products
- Market Dominance & Monopoly (Foreign players)
- Acceptance of Nuclear Technology
- Financing in-house EB accelerator to reduce operation cost
- Maintenance to ensure continuous facility uptime (e.g. Ebeam)
- Higher irradiation cost (not dedicated facility)
- Government procedures/Bureaucracy

Thank You for Your Attention







