Extracting Renewable Energy from the Oceans. What is the potential?

**ABSTRACT**

Renewable Energy has been a hot topic especially for the carbon emission reduction scheme to reduce Green House effect. There are various types of renewable energy namely Biofuel, Biomass, Geothermal, Hydro, Solar, Wind as well as Marine Energy (Tidal, Wave). In this presentation, it will be concentrated on extracting renewable energy from the oceans utilising tidal power.

Our oceans cover over 71% of the Earth surface and will become an important source of future energy needs. Extracting renewable energy from moving water has the advantage of predictability and will have its place in the world’s energy mix once holistic engineering solutions can be found to reduce the Levelised Cost of Electricity (LCOE) to competitive levels.

The new generation of hydrokinetic turbine represents breakthrough technology utilising a sophisticated design and employing advanced materials & manufacturing techniques to produce low-cost electricity by harnessing the energy contained in moving bodies of water. As the water flows horizontally, the turbine blades spin and drive a generator which produces electricity.

To achieve this, team of design and mechanical engineers, aeronautics engineers and those from precision equipment manufacturing have been recruited as well as borrowing knowledge and experience from other industries. Besides, manufacturers also utilise rapidly emerging engineering technology such as cloud computing for simulations, 3D printing for components and robotics for fabrication. Electrical engineers have also been recruited to evaluate the performance of the renewable energy generated from the tidal turbine with data collected being transmitted back to the control / management centre via GSM for analysis in order to achieve the optimum performance.

**BIOGRAPHY**

Bruce Poon received his B.Sc. degree in Computer Science & Pure Mathematics and B.E. degree in Electrical Engineering from the University of Sydney, Australia in 1983 and 1985 respectively. He obtained his MBA (High Honours) in International Finance & Business from Oklahoma City University, USA in 1991. In May 2017, he received his PhD in Electrical and Information Engineering from the University of Sydney, Australia.

Bruce had received his academic and industrial training in Hong Kong, Australia, USA & UK. He has over 30 years’ experience in sales & marketing, business development and project management working in Hong Kong, China and Australia in the fields of Telecommunication, IT & Electrical Engineering with special interest in power protection and renewable energy. While working in Hong Kong for Analogue Technical Agencies Limited (now Analogue Engineering Group), he was invited by the Department of Electrical & Electronic Engineering in the University of Hong Kong to develop training course on computer control for building services and to lecture it to undergraduate and postgraduate engineering students as well as to Professional Engineers in the Extra-Mural course. He was also invited by the Hong Kong Productivity Council to conduct training course for Professional Engineers. He is currently working as a consultant for Computer Network & Electrical Engineering especially on Power Engineering and Renewable Energy. In terms of Renewable Energy, he is currently a consultant for MAKO Tidal Turbines Pty Ltd – an Australian Technological company specialises in the design & implementation of mini tidal turbines to extract marine energy.

Since 1991, he has been serving in the IEEE New South Wales (NSW) Section committee to promote IT and Electrical & Electronic Engineering to academics as well as industries. He is an active member of the IEEE Computer Society, IEEE System, Man and Cybernetics (SMC) society and member of the organising committee in several IEEE conferences in Australia and China.

Bruce is a member of Hong Kong Computer Society (HKCS) & The Institution of Engineering and Technology (IET) and senior member of Australian Computer Society (ACS) & The Institute of Electrical and Electronics Engineers (IEEE). He is also a Justice of Peace, New South Wales.

All are welcome!