#	**Pariotis Efthimios** Mechanical Engineer, PhD	
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Presentation title:	**Two – Stroke Marine Natural Gas Engines: Concept, Challenges and Current Market Solutions**	

Maritime transport is the backbone of international trade and the global economy. Around 90 % of global trade by volume and over 70 % of global trade by value are carried by sea and are handled by ports worldwide. The main type of propulsion and auxiliary engine used in marine transportation is Diesel engines due to their superior efficiency and durability. International shipping accounts for approximately 2.7% of world CO2 emissions from fossil fuel combustion. The contribution of shipping industry on other harmful pollutants like NOx and SOx is also significant. In this context, International Maritime Organization and other emission regulatory agencies has set mandatory international strict and achievable emissions mitigating standards / legislation, which affects directly the conventional engine operation, design and fuel used.

One of the most promising concepts proposed to simultaneously reduce all the regulated pollutant emissions and in some cases even fulfill the most strict emission standards without implementing any after treatment measure, is the substitution of the conventional HFO with Natural gas. The current presentation aims to provide in a simple but scientifically well documented way, the underlying physics and technical requirements related to Natural gas combustion, focusing especially on 2-Stroke engines, which are dominant as prime movers in shipping industry. The major challenges of this new concept will be identified and the dominating techniques that are readily available in the market are presented explaining their main advantages and drawbacks.

CV:	
Dr. Efthimios Pariotis was born in 1972 in Greece. He received his MSc Diploma in Mechanical Engineering in 1995 and his PhD degree in 2005 from the National Technical University of Athens (NTUA). From 1997 until 2009 he has been an adjunct faculty member at the Internal Combustion Engines Laboratory (ICEL) of the Scholl of Mechanical Engineers in NTUA, participating in the teaching of "Internal Combustion Engines I (Thermodynamics)" at a graduated course and "Thermal Engines" at a Post-graduated course. From 2005 to 2008 he has been an adjunct Lecturer at the Hellenic Army Academy, being responsible for teaching "Internal Combustion Engines". Since 2009 he is Assistant Professor at the Hellenic Naval Academy, being responsible for teaching the course of "Heat Transfer" and "Marine Auxiliary Systems and Pipe Networks" and co-teaches the courses "Thermodynamics", "Marine Diesel Engines" and "Fluid Mechanics". His research interests focus on Diesel Engines performance and emission modeling using phenomenological and CFD models, techniques for diesel engine emission reduction using internal measures, Diesel engine experimental techniques focusing on performance & emissions, Exhaust heat recovery, Heat transfer in Internal Combustion Engines and the application of Energy saving techniques in Ships. Dr. Pariotis has participated in 24 European and National projects as a member of the Internal Combustion Engines Laboratory (ICEL) of NTUA, focusing on diesel engine performance and emissions, in cooperation with major EU engine manufacturers / stakeholders. His research work has been published in 40 publications at peered reviewed International Journals and Conferences and he has over 350 external references on his work.	
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