



The Department of Engineering and the Marine & Carbon Lab invite you to the PhD defense:

## A Paradigm Shift for Selectively Decarbonizing China and Cyprus

### Abstract



China, is the top polluting country liberating 29.3% of world's CO<sub>2</sub> emissions. Most of its electricity, 33% originates from the electricity sector. Four different scenarios were formulated to investigate the future emissions and costs of China's electricity sector along with carbon sinks, from 2025 until **2050**. Results indicate that **renewable energy** alone **cannot** meet China's power needs unless supplemented by fossil fuels. China can attain a **net-zero emissions** electricity sector only by **phasing**

**out coal and utilising nuclear as a baseload technology**. Renewable energy scenario yields the most expensive electricity for China but realises net-zero emissions.

The European Commission has set a goal toward net-zero emissions by 2050 to contain temperature increase to 1.5°C compared to pre-industrial levels. Cyprus' electricity shares some similarities with China since their both highly related to fossil fuels. On the other hand Cyprus electricity sector is unique since it is the only European Nation country not connected to European grid national. The island's **transportation and electricity** sectors compromise **77%** of its total emissions. During the presentation, 4 different scenarios will be examined with a view of meeting the goals set by the European Commission, for 2050. Cyprus can become carbon neutral and even achieve a 100% electric passenger vehicle fleet. Carbon tax can possibly lead to path towards decarbonisation. Finally to investigate other pollutants such as NO<sub>x</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and CO in Cyprus a **traffic and heat emissions dispersion model** was used for the city of Nicosia for a 9-month period. The data used were obtained by DIAVLOS and DLI respectively. Simulated data lied within the **statistical performance indicators**. Moreover, utilising relative risk equations the mortality rate of different policies and scenarios were calculated. The most promising solution for **NO<sub>x</sub> emissions**, which would lead to a **70% decrease** would be to **ban all diesel** passenger and light-duty vehicles and non-Euro 6 vehicles. Lastly, curbing PM<sub>2.5</sub> calls for banning the use of fireplaces which is expected to realise at least a **20% reduction** compared to year 2017.

### Speaker's bio:

**Mr. Evangelos Demetriou** is currently a PhD candidate in Oil, Gas and Energy Engineering, at the University of Nicosia. He works as an Engineer at the Department of Urban Planning. His doctoral research focuses on the energy policy of the electricity and transportation sectors of China and Cyprus. As part of this investigation, he has analysed different scenarios associated with full decarbonization of the future energy mix, the role of renewables, electric power storage and carbon removal technologies. His research interests focus on climate change, electricity and transportation policy and carbon emissions. Evangelos holds a Civil Engineering degree from the National and Technical University of Athens (NTUA).

The talk to be delivered in English, will be open to the public and will be lived streamed via WebEx:

[www.webex.com](http://www.webex.com); link: <https://bit.ly/3scz4ku>; Meeting number: 27309920256; Meeting pass: kEEcMsEp824. For more info please visit the Marine & Carbon Lab: [www.carbonlab.eu](http://www.carbonlab.eu)

**Date: Wed., May 11<sup>th</sup>, 2022.**

**Venue/Time:** Conference room 102, [Research & Tech Bldg](#), **09:10-10:00am.**