



## April/May 2022

As per previous announcements due to Covid-19 there will be bi-monthly news until further notice. Any news up-dates will be implemented as and when necessary, during June and July 2022.

### Important announcement

The PoliUniBus Climate Action Air Quality Conference 2022 will take place on 23<sup>th</sup> June 2022. The programme for the Conference is being finalised. More information will be available soon.

### PROMETHEAS Project

The PROMETHEAS project Spanish Multiplier event and partner meeting took place in Barcelona, Spain, 6-8<sup>th</sup> April 2022.



**PROMETHEAS Multiplier Event chaired by Professor Martin and Professor De Malo with representatives from Industry and IMO making presentations on issues relating to seafarers' mental health and how to eradicate bullying at sea**



**PROMETHEAS Project partners meeting in Barcelona, April 2022**



## News

The next and final event before the project ends in August will take place in Szczecin, Poland 16-17 June. This event will be the final conference and partner meeting.

PROMETHEAS multiplier UK event has been scheduled for 8<sup>th</sup> June 2022. Members of the UK SIG Mental Health and Wellbeing have agreed to support this event. More on this workshop in future issues of MariFuture.

### PROMETHEAS Success

Following the presentation of the PROMETHEAS project at IAMU in October 2021, a paper produced by the partners was presented at TransNav (<http://www.transnav.eu>), the International Journal on Marine Navigation and Safety of Sea Transportation and was published in their journal in March 2022, Volume 16, Number 1 (DOI: 10.12716/1001.16.01.13). The paper was titled: Mental Health Surveillance Tools for Sea Workers Mental Health Surveillance Tools for Sea Workers.

### GreenShip Project

The last partner meeting took place in Greece on 18-20 February 2022.

The next partner meeting is scheduled on 4-6<sup>th</sup> May 2022 in Ljubljana, Slovenia. It is expected to finalise the main Intellectual Output (IO 5) during this meeting and review the progress being made on IO 6 and IO 7. The final conference of GreenShip will take place in Barcelona, 30 June, 1 July 2022.



**Professor Reza next to the GreenShip Poster and the Electric Ship project stand taken during his visit to UPC, Barcelona, Spain, April 2022**

C4FF's University Centre (Garden City) supported the development of the GreenShip new courses. The courses were submitted to the Institution of Marine Engineering, Science and Technology (IMarEST). The courses have now received recognition as IMarEST CPD courses. C4FF is also in the process of finalizing the development of an e-course in mentoring. With support from IMarEST the





## News

course is now being evaluated and is expected to be submitted as a recognized CPD course in the near future. In parallel, a course in improving mental health at sea and eradicating bullying is being developed with several partner organizations in the EU.

### PoliUniBus Project

The next partner meeting took place in Helsinki, Finland on 28-29<sup>th</sup> April 2022 and the final conference and partner meeting is being scheduled for mid-June 2022.



PoliUniBus Workshop in Finland.

### LifeSkills VR

The next meeting of this project is expected in July 2022. The dates are being finalised.



## News

### Special Interest Group in Particulate Matter Filtration Flows

7<sup>th</sup> meeting of the Special Interest Group in Particulate Matter Filtration Flows took place **online on 25<sup>th</sup>, February, 2022**. The findings are expected to be discussed at the Air Quality Conference being arranged for mid June 2022.

We are looking forward to seeing all those interested online on 25<sup>th</sup> February 2022.

### Winners of Joint C4FF and IMechE Midland Climate Change

C4FF and IMechE thanks the participating schools which took part in their Air Quality / Climate Change School Competition.

We are pleased to report that the winners were acknowledged and informed that their entry has been chosen as one of the winners – congratulations.

They will be receiving a prize of £250 together with a framed certificate and your school will also be receiving the same amount for use in STEM related activities.

For details and related information please contact Sherida Walker at C4FF ([sherida.walker@c4ff.co.uk](mailto:sherida.walker@c4ff.co.uk)).

The winners would also be invited plus 1 guest (parent / guardian / teacher) to join us at the Institution of Mechanical Engineers annual dinner where the presentation of the certificate will be made. As this is the 175<sup>th</sup> anniversary of the Institution, the dinner will be held in the Birmingham area where the IMechE was founded in 1847. The date for the dinner is 24<sup>th</sup> November 2022.

Air Quality / Climate Change School Competition to coincide with the 2021 United Nations Climate Change Conference (COP26) held in Glasgow in November last year and the launch of the 175<sup>th</sup> anniversary year for the Institution of Mechanical Engineers (IMechE), The Midland Region of the IMechE, together with the Centre for Factories of the Future (C4FF), organised an air quality / climate change competition for secondary schools. Pupils were asked to study a highly technical, abridged 16 page report on air pollution and to answer a series of questions. They were then required to compose a 500 word essay on “how you / your family can make changes to your lifestyle and/or other actions which will result in the reduction of greenhouse gas emissions. Two winning entries were chosen – Anisa Tasnim Begum (14) from King Edward VI Five Ways School in Birmingham and Miriam Clements (16) from Rugby High School. Both pupils win £250 plus a framed certificate and their schools also receive £250 to be spent on STEM activities. Professor Dr Reza Ziarati – Chair, Centre for Factories of the Future and author of the technical paper used in the competition said, “We were impressed by the quality of these two entries. It was clear that both girls fully understood the problems we are facing today with climate change and air quality and they had given very good essays on ideas for tackling the problems. Clearly they had researched into the problem.” The full report: Pollution in the Air – A Local and Global Concern can be found at: [https://www.marifuture.org/Reports/Development-Papers/ADP\\_09\\_2020\\_MARIFUTURE.pdf](https://www.marifuture.org/Reports/Development-Papers/ADP_09_2020_MARIFUTURE.pdf) [https://www.marifuture.org/Reports/Development-Papers/ADP\\_10\\_2020\\_MARIFUTURE.pdf](https://www.marifuture.org/Reports/Development-Papers/ADP_10_2020_MARIFUTURE.pdf) John Butler.



## News

Education Officer – Institution of Mechanical Engineers, Midland Region. 3rd March 2022 Anisa Tasnim Begum Miriam Clements

An article on this competition will be submitted for possible publication in the Institution magazine plus, possibly, other technical journals.



On the left Anisa Tasnim Begum and on the right Miriam Clements

### New Papers

#### PROMETHEAS

Following the presentation of the PROMETHEAS project at IAMU in October 2021, a paper produced by the partners was presented at TransNav (<http://www.transnav.eu>), the International Journal on Marine Navigation and Safety of Sea Transportation and was published in their journal in March 2022, Volume 16, Number 1 (DOI: 10.12716/1001.16.01.13). The paper was titled: Mental Health Surveillance Tools for Sea Workers Mental Health Surveillance Tools for Sea Workers.

#### COP26

The Chair of C4FF, Professor Ziarati, was involved in a preparation a policy paper on clean transport peer reviewed by IMechE and presented at their COP26 conference on 28-29<sup>th</sup> October 2021. Professor Ziarati also chaired a discussion panel on 29<sup>th</sup>. The paper can be found at <https://www.imeche.org/policy-and-press/reports/detail/the-transport-hierarchy-a-cross-modal-strategy-to-deliver-a-sustainable-transport-system>



## News

### Great Success

The Mentor project was recently evaluated by the EU assessors and was given a grade of 95% one of the highest ever given. It was rated excellent and an award of 'best practice'. This is wonderful news giving an indication of hard work and dedication of the project partners. Well done all partners.

### International Association of Maritime University's (IAMU) Annual Conference 2021

C4FF's supported paper on 'Towards Zero Emissions II – Greenship Project' was accepted and presented by IAMU on 26<sup>th</sup> October 2021 in Alexandria, Egypt. The Paper will be published in the prestigious IAMU's 2021 proceedings and can be found in the IAMU proceedings or at [https://www.marifuture.org/Publications/Papers/Towards\\_Zero\\_Ship\\_Emissions\\_II-%20GreenShip-IAMU\\_2021.pdf](https://www.marifuture.org/Publications/Papers/Towards_Zero_Ship_Emissions_II-%20GreenShip-IAMU_2021.pdf).

A second paper prepared by PROMETHEAS project partners was accepted by IAMU and presented in the poster session and published in the IAMU 2021 proceedings. PROMETHEAS concerns the mental wellbeing of seafarers. The paper can be viewed at [https://www.marifuture.org/Publications/Papers/PROMETHEAS\\_Project\\_Mental\\_Health\\_Data\\_Research\\_Hub\\_for\\_Seafarers.pdf](https://www.marifuture.org/Publications/Papers/PROMETHEAS_Project_Mental_Health_Data_Research_Hub_for_Seafarers.pdf). The poster can be viewed at [https://www.marifuture.org/Publications/Newsletters/IAMUC\\_prometheas\\_newsletter.pdf](https://www.marifuture.org/Publications/Newsletters/IAMUC_prometheas_newsletter.pdf).

### PoliUniBus Climate Change Action for Air Quality Multiplier Event 2022

The Conference will follow the same programme as the previous event which was organized in support of COP26 and scheduled on 14<sup>th</sup> October 2021 at Coventry University. The 2022 event is organized by C4FF in support of its EU funded PoliUniBus Project with the backing of Midland Engineering Institutions viz., IMechE, IET and IMarEST and on behalf of the Midland Air Quality Group.

### Main Conference Objectives

To mitigate poor air quality due to climate change and bring all the key stakeholders in the region, and from wider afield together to discuss how to manage the impact of poor air quality on local residents

### Target Audience

Representatives of citizen communities, academia, industry, councils, policy makers, environmental groups, air quality specialists and subject experts worldwide.

### Purpose

- To gain a wider understanding of the effects of poor air quality



## News

- To understand what we currently measure and consider its adequacy
- To communicate the above understanding to the widest possible audience
- To share the evidence based on the health and social impacts of poor air quality
- To share good practice
- To understand the likely impacts of poor air quality on Cities with a view to be aware that air quality does not differentiate administrative boundaries
- To consider possible ways to mitigate against poor air quality
- To agree next steps towards cleaner local air

**Programme 15<sup>th</sup> June 2022 – Coventry University**



### **Session 1 Local and National and International Efforts**

- 09:45 - 09:55 **Introduction and the Expected Outcome**  
09:55 - 10:30 **The National and Local perspectives - Government Message**  
10:30 - 10:50 **Young People and Their Views on Environmental Issues**  
10:50 – 11:00 **Work by Engineering Institutions and Business**  
11:00 - 11:10 **Schools and Climate Change**  
11:10 - 11:20 **PoliUniBus Project - A platform for initiating and implementing Air Quality Projects**

### **Session 2 Importance of Trees and Vegetation**

- 11:20 - 12:20 **National and Local Efforts in Improving Air Quality and Health Impact**  
11:20 - 11:35 **Environmental Issues – Impact of Vegetation and Plants on Air Quality**  
11:35 – 11:50 **Tea/Coffee Break**  
11:50 - 12:20 **Importance of Saving Trees – Birmingham and Black Country Tree Study**

### **Session 3 Technical Section**

- 12:20 - 13:00 **Emissions and Air Quality Measurement**  
12:20 - 12:40 **IET Lecture Air Quality During Commuting**  
13:00 - 14:00 **COVID Deep Cleaning/Working Lunch**  
**Poster Session – Climate Change Projects and Policy Paper on Clean Transport and COP26**  
14:00 - 14:20 **IMechE Lecture Innovation in Vehicle Component Design and Manufacture**  
14:20 - 14:55 **Report from the Councils**  
14:55 - 15:00 **Local and National Efforts in Combating Global Warming/Conclusions**  
  
15:00 - 15:15 **Tea/Coffee Break**





## News

**Session 4      PoliUnibus Project Group – All invited**

**15:15 - 17:15    PoliUniBus Workshop (Led by Liverpool University)**

**17:15            End of conference**

### **IMechE COP26 Policy Papers and Conference**

This conference is organised by IMechE in support of COP26 will take place on 28-29<sup>th</sup> October 2021 just before the main COP26 event in Glasgow, 1-4 November 2021. The conference targets Critical Technologies, Cities and Built Environment as well as Clean Transport.

Details of the Conference can be obtained from <https://www.imeche.org/news/news-article/cop26-an-'excellent-opportunity'-for-imeche-to-inform-future-policy>. To register please use the link. Professor Ziarati the Chair of C4FF as the chair of the Midland IMechE will speak at the conference and will chair the discussion panel on 29<sup>th</sup> October 2021.





## News

### **Cyber Space Projects**

The new Cyber Space project will deliver an encrypted traffic analysis service platform for cyber security. The platform will support a number of basic building blocks necessary for any Machine Learning (ML) and Deep Learning (DL) based traffic analysis. C4FF is pleased to be involved in this interesting and innovative project and disseminate and exploit the project outcomes in its network in UK and across Europe.

C4FF has been involved in several EUREKA projects and currently support two ITEA3 projects.

The new research project now is called ENTA which will commence shortly. C4FF will use the findings of this project to support its local Cyber Space project to ensure small companies in its locality would also benefit from this outcome of ENTA research work. ENTA has already been approved and Cyber Space is also expected to be approved by the UK Government soon.

In support of its efforts in countering cyber espionage and attacks, the Centre for Factories of the Future (C4FF) has developed a full degree programme and various modules have already been tested at associated universities including C4FF's own university, namely, University Centre Garden City (UCGC). Furthermore, C4FF has started a new project named Cyber Space to help mainly very small businesses to cope with complexity of computer systems and networks and become cyber security safe.

C4FF is an RTD capacity based in Coventry and Kenilworth (UK). C4FF is the instigator of the Factories of the Future projects in the UK and supported similar developments in the EU. Since the company was founded in 1996, C4FF has gained extensive experience in participating and co-ordinating EU and UK funded R&TD projects in areas such as: Artificial Intelligence Systems, Cyber Security, Sales Forecasting, Market Intelligence Knowledge Extraction, Innovation Management, Factory Automation and Enterprise Resource Planning. C4FF has several ICT, manufacturing facilities and laboratories worldwide. These laboratories are equipped with most up-to-date facilities. We also have access to several laboratories in several partner institutions. C4FF has an established reputation for developing novel manufacturing systems and software for factory management, including for lean practices. We also have many years of experience in ICT and Manufacturing research and development, as well as cyber security. Cyber Security is of particular interest to C4FF Maritime Division supporting the shipping industry against cyber attacks.

### **Life Skills VR – a new EU/UK Funded Project**

#### **VR Innovation Project - Life Skills for Employment in COVID-19 Era Through VR Innovation Project - Another revolutionary idea from C4FF**

Although this project proposal is about Life skills development helping young and old find worthwhile jobs, VR offers a range of solutions in several other areas.

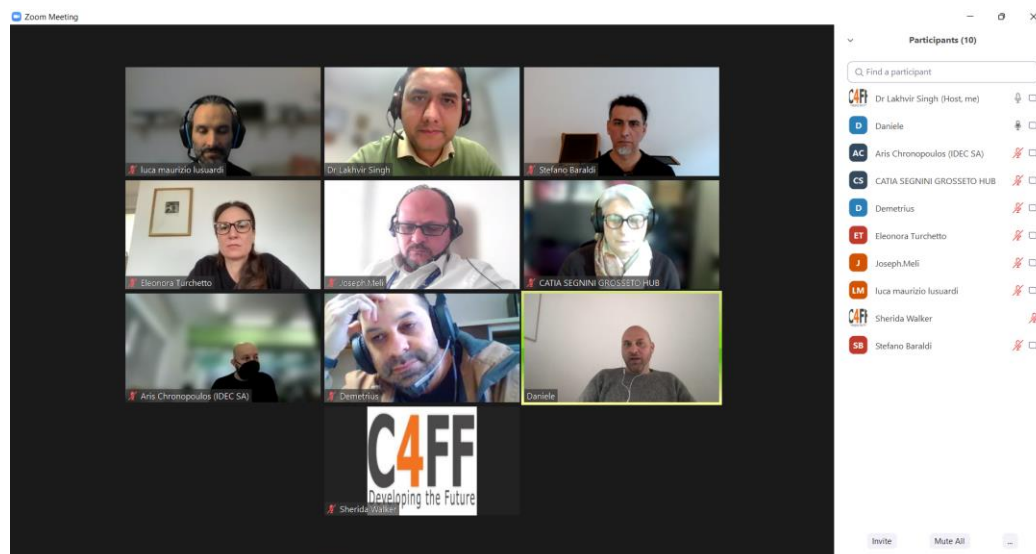


## News

Our proposed project aims to solve the problem of giving youth the necessary skills and knowledge of what their skills and abilities are and in which occupation they can excel in and have a bright future. By approaching the issue at the earliest stage, the aim is to prepare the young and to reduce stress and future dissatisfaction and provide a glance of future opportunities. The users will be able to recognise missing skills and thus focus on the important aspects by themselves and therefore will be able to eliminate skills mismatching and develop key skills. Also, by knowing their strong points, the Generation C will be able to develop themselves to higher levels in seeking and retaining good and well-paid jobs.

The VR proposed solution will have many more applications providing 3D visualisation of technical or non-technical information for learning new situations, acquiring new skills or simply helping us to navigate a new location or perform our jobs better. It can be used as a ship or boat simulator or navigation system. The proposed system can also capture information for analysis later and so forth. The combination of smart phones and VR technology can revolutionise the way we live and learn. What about using the VR devices for detecting dangers on our path for those with visual impairment or having access to information at meetings?

The project could support some of the work initiated by C4FF to help design new AI software to develop new VR applications. With C4FF's track record of developing novel AI solutions there is an expectation that a number of disruptive products and services will be introduced in the application of computer technology in our daily jobs and lives.



### Life Skills VR Project Partner Meeting

The next face-to-face partner meeting will be held in Italy on 24-25 March 2022. For more information, please visit the project website: <https://lifeskillsvr.com/>

### Corona Virus

The problems associated with Corona Virus continue to have an impact on C4FF's work including its charitable networks and business units. Some of the EU and Eureka projects are progressing in general but some EU funded projects are being either re-scheduled or extended. This situation if



## News

continued may impact other projects and activities. We hope these surreal times will come to an end and that we can continue to work on all projects as planned soon. The manning for the existing and new projects has been agreed.

### Key Announcements

As reported in the previously, C4FF's University Centre (Garden City) supported the development of two new courses in Technological Innovations and Research Methods. The courses were submitted to the Institution of Marine Engineering, Science and Technology (IMarEST). Both courses have now received recognition as IMarEST CPD courses. C4FF is also in the process of finalizing the development of an e-course in mentoring. With support from IMarEST the course is now being evaluated and is expected to be submitted as a recognized CPD course in the near future. In parallel, a course in improving mental health at sea and eradicating bullying is being developed with several partner organisations in the EU.



### New CPD Courses for C4FF

### 2021 Year of Seafarers Mental Health and Wellbeing

MariFuture continues with the publication of a Development Paper on its key projects which this year is efficient ship and Seafarers mental well-being. The papers will focus on the toxic pollutants from shipping and coping with mental stress at sea particularly due to Covid.

In support of this initiative C4FF with support from PROMETHEAS project partners prepared a presentation at the IMarEST's Global Conference for Seafarer Mental Health and Wellbeing. The title of C4FF presentation was PROMETHEAS Project - Mental Health Data Research Hub for Seafarers. The presentation was the first paper presented on the first day of the conference which was held on Tuesday, 25<sup>th</sup> May. More information about this even and for registration please see [1st Global Conference for Seafarer Mental Health and Wellbeing](#).



### PROMETHEAS Workshop 25<sup>th</sup> May 2021

The Prometheas Partners also prepared and presented a paper at TranNav 2021, a major event in Poland. More information about this conference can be found at the conference website - <https://transnav2021.umg.edu.pl/>. The title of the paper is 'Tools for supporting mental health surveillance of sea workers'. C4FF is a co-author of this paper. Another paper is being prepared for presentation at International Association of Maritime Universities (IAMU); more on this at the next News.

The partners of Greenship are preparing a paper for presentation at IAMU. Details of this paper will be publicised in the next news.

### Funded Projects

#### PROMETHEUS

The last partner meeting took place in Barcelona, Spain on 7-8 April 2022.

The next event is the Polish Multiplier event which is being organised by MUS on May 12-13 in Świnoujście.

PROMETHEAS multiplier UK event has been scheduled for 8<sup>th</sup> June 2022. Members of the UK SIG Mental Health and Wellbeing have agreed to support this event. More on this workshop in future issues of MariFuture.

The final conference is scheduled for 16-17<sup>th</sup> June and the project is expected to end on 31<sup>st</sup> August 2022.

This proposal was accepted in mid- August 2019 and concerns the mental well-being of ship crew. The project started in November 2019. The first meeting of the partners was on the 18-19 November 2019 in Athens. The partners have met on regularly and next meeting is planned for 17<sup>th</sup> September 2021 at 11:00 CET. Partners have also prepared the first Interim Report and this together with all the necessary documents including the timesheets were sent to Polish NA. The feedback from the Polish NA has been positive.





### **PROMETHEAS Project team from Poland, UK, Greece, Finland, Spain and Slovenia**

C4FF produced the first draft of the two proposed chapters of the Prometheus course and prepared a Learning and Assessment strategy for the Course. Several quizzes were prepared for the partners' considerations. The partners as agreed produced more content and quizzes. Partner for Greece has produced the first draft of the Chapter on Bullying to complement the existing worked carried out by C4FF supported by all partners.

Regarding other dissemination activities C4FF attended the **Nautical Institute's Seafarers' Mental Health – Turning Talk into Action webinar**, on 8th June 2021. An interesting workshop seeking practical solution to the mental health issues often faced by seafarers and particularly heightened by Covid pandemic. Professor Ziarati asserted that recent studies show that Fatigue to be by far the greatest factor affecting seafarers mental wellbeing and that the only organisation than can help and an immediate response is IMO. Unfortunately IMO has been very slow as it is composed of national administrations who in turn often take the interest of their shipping industry into consideration. As ship companies have been facing economic uncertainties, they are not in a position to agree to changes that could cost them more particularly at these surreal times of Covid era. Shipping companies are all without exception under severe commercial pressure and some have been facing insolvency problems.

It was also stated that national administrations in the West are often progressive and try to address their seafarers' problems head on while the story could be very different in other parts of the world. This is an area where IMO can help by imposing some rules to protect seafarers' basic rights.

### **Formation of Special Interest Group (SIG) for Seafarers Mental Health**

As reported in the previous News, C4FF have been involved in helping to set up a mental health group with LR, IMarEST, HSE, MCA, MaritimeUK, ISWAN and several others to find ways to share knowledge and experiences in mental health topic areas. The group is keen to organise workshops/conferences and seek support in setting up a formal SIG in this connection. The first workshop was organised by MaritimeUK on Mental Health on 2<sup>nd</sup> March 2021. C4FF attended this workshop and made contributions to it reporting on Prometheus findings so far.



## News

Prior to the MaritimeUK C4FF together with IMarEST become involved in a discussion to set up first a UK Special Interest Group (SIG) to promote a series of action to help improve mental health and wellbeing at sea. The SIG was formed in February 2021 and since then had several meetings the last meeting took place on 13<sup>th</sup> April 2021. The discussions at these meetings have led IMarEST on behalf of SIG to organise a major conference titled: 1<sup>st</sup> Global Conference for Seafarers Mental Health and Wellbeing on 25-26 May 2021. The outcome of this conference is expected to lead to plan for future collaborations and preparation of several proposals.

The last meeting of partners was held on 21 May 2021 and the next is scheduled for 18<sup>th</sup> June 2021.



**Bi-weekly meeting of Maritime SIG 8 June 2021**

### **Current SIG members:**

Professor Reza Ziarati – PROMETHEAS; Centre for Factories of the Future  
Stephanie McLay – LR  
Richard Graham – IMarEST  
Daniel Stoker – IMarEST  
Panos Stavrakakis - HSE  
Olivia Swift – LRF  
Steven Jones – Happiness Index founder  
Pav Hart- Premkumar – MCA  
Melanie White – UK Chamber of Shipping  
Chrissie Clarke – Maritime UK  
Ben Gibbons – Maritime Charities Group (MCG)  
Ben Bailey – Mission to Seafarers  
Caitlin Vaughan – LRF  
Luca Tommasi - ITF Seafarers' Trust  
Cerian Mellor - Shell  
Hazel Lewis – MCA  
Sandra Welch – Seafarers Hospital Society  
Chirag Bahri – ISWAN



## News

Kishore Rajvanshy – Fleet Management Ltd.

Joanne Stokes – LR

Volkan Arslan – LR

### PROMETHEAS UK Workshop

**25<sup>th</sup> July 2021 - 10:00-12:30**

This workshop was initiated by a newly formed special interest group on mental health and wellbeing in the UK and organised co-jointly by C4FF and IMarEST to encourage a practical approach to improving seafarer mental health and wellbeing and disseminate the work of PROMETHEAS project.

#### Attendee list:

There were a total of 75 attendees from the following organisations:

HA Group
Southampton University
Marine Accident Investigation Branch
HSE
Lloyd's Register
Maritime UK
Maritime and Coastguard Agency
Burgess Yachts
Fugro
Sea Wellbeing
Lloyd's Register Foundation
C4FF
World Maritime University
Stella Maris
Practical Psychology Consultancy
Keil Centre
Sailors Society
The Seafarers Charity
Shell
Human Rights at Sea
UK Chamber of Shipping
Maritime Executive
Kings College London
ISWAN
Nordic Medical
Scoutbase
Standard Club
Southampton Solent University
Seaways Psychology



## News

MNWB
Well at Sea
ISWAN
Rhine-Waal University of Applied Sciences
MTM Agency
Elvictor
Atlantictowing
Liverpool Museums

Due to data protection act the names could not be published.

The workshop was the first part of the 1st Global Conference for Seafarer Mental Health and Wellbeing which brought together global leaders and key stakeholders from the maritime sector who are actively involved and have a keen interest in discussing practical solutions to improving seafarer mental health and wellbeing. The focus was on interventions and exploring best practice of implementation, monitoring results and identifying what more can be done.

The workshop was sponsored by IMarEST, Lloyd's Register, MaritimeUK and several other maritime organisations in the UK. For all sponsors see Event website:

<https://www.imarest.org/mentalhealth>.

### Workshop/Conference Committee:

Co-Chair: Capt Panos Stavrakakis PhD CEng FIMarEST, Champion of IMarEST Mental Health & Wellbeing Initiative and Head of Centre of Organizational Health & Wellbeing, Health & Safety Executive

Co-Chair: Stephanie McLay MSc MBPsS, Senior Human Factors Consultant, Lloyd's Register

Chrissie Clarke, Programme Manager Diversity and Skills, Maritime UK

Hazel Lewis, Seafarer Safety and Human Element Policy Manager, Maritime and Coastguard Agency

Pav Hart-Premkumar, Human Element Policy Specialist, Maritime & Coastguard Agency

Richard Graham CEng CMarEng FIMarEST, Chair of IMarEST Professional Affairs & Education Committee

The C4FF/IMarEST were keen to hear about experiences from all perspectives: Senior leadership, ship owners/operators, flag states, port states, charterers, manning agents, unions, training providers, academia, associations, and regulators.

The PROMETHEAS Project was presented by Professor Dr Reza Ziarati, C4FF, PROMETHEAS Project coordinator in the UK, followed by presentations on several mental health and bullying key topics:

- Raising awareness, overcoming stigma, and understanding the effects of working at sea
- Safety culture and how this can be used to promote positive change
- Workers' rights and violations
- What lessons can we learn from other industries?
- What policies and practices have been/could be implemented and their effectiveness to support seafarers' mental health and wellbeing?





## News

- What challenges do smaller crews/companies face?
- What does a healthy working environment look like? How can we create a healthy working environment? What benefits a healthy working environment brings to the industry?

The conference took place online using the IMarEST's online conference platform, with speakers and delegates able to attend, and network with each other, from anywhere in the world.

### **Key features include:**

- Flexible 2-day conference programme of 90-minute live sessions.
- Dedicated networking sessions where you can explore your views on presentations.
- Exclusive on demand access to sessions via IMarEST TV for 6 months after the conference.
- Virtual exhibition area to connect with sponsors and supporting organisations.
- Easy access to the conference platform via your computer and/or mobile devices.
- IMarEST CPD-recognised Certificate of Attendance following the conference

For further information please contact Professor Reza Ziarati at [reza.ziarati@c4ff.co.uk](mailto:reza.ziarati@c4ff.co.uk)

C4FF has had provisional agreement from its SIG to run another workshop in March/April/May 2022. Initial preparation has already begun.

### **Outcome of PROMETHEASs Multiplier Event in Finland**

As reported the two-day multiplier event run in Finland by Prometheas project partners was successful. C4FF and partners have had several meetings to discuss outcome of Multiplier event and review the plan for the implementation of the project. The E-course being developed by support by all partners led by C4FF is progressing well. Several workshops were arranged or participated by C4FF in support of Prometheas project. The following are summary of some:

### **The Institution of Mechanical Engineering (IMechE) Wellbeing Initiative workshop**

The Institution of Mechanical Engineering wellbeing initiative workshop delivered by Dr Dougal Sutherland on 16<sup>th</sup> December 2020 describing a model for self care by focusing on Threat paused, Drive (helpful moves/actions) and Soothe (values, skills and strength that help). A short description of the model is presented below:



### Running the COVID marathon overview

In this overview workshop we use the metaphor of running a marathon to acknowledge the demands of the pandemic on all of us and the wider implications that COVID-19 has on organisations and their people. We want to recognise the prolonged nature of this situation and introduce evidence-based skills to sustain ourselves over this time.

#### MODEL FOR BALANCING EMOTIONS

Research suggests people switch between three systems – threat, drive and soothe – to manage their emotions. All of these systems take place in the brain and are associated with different hormones and emotions.

The threat system serves to protect us from danger and is critical for survival. However, when operating from our threat system, our attention and focus can narrow and we can get stuck there.

The drive system is important for motivation and pursuing goals. Our soothe system helps us settle ourselves and feel calm, safe, and connected.

A key message is that we are at our best when these three systems are in **balance**.

How big is each circle for you at the moment?

Figure 1: Paul Gilbert, Compassion-focused therapy

#### SKILLS FOR MANAGING THREAT

Firstly, we can calm the threat system by deliberately taking a pause, doing a **body scan** or a **breathing exercise**.

Secondly, we want people to **notice** when their threat system is being activated before it starts to have a negative impact. We want to be able to **name** it - for example, naming the feeling of being overwhelmed, a thought of "not another thing!" or recognising that you're pacing around the room. Then, having clocked what we are experiencing, we want to be able to intentionally **navigate** towards making helpful moves.

#### SKILLS FOR MANAGING DRIVE

We want to be able to activate our drive system towards making helpful moves. Identifying our **values**, and playing to our **skills** and **strengths**, can help us to move towards useful behaviour. What behaviour would you engage in if you were living in line with your values?

#### SKILLS FOR MANAGING SOOTHE

We need to activate our soothe system to recover. **Self-care**, especially during times of uncertainty, is essential and should be made a priority. We want to be present, kind and gentle towards ourselves and others. We can use grounding skills such as **dropping anchor** to soothe in the moment.

Thanks for joining us. Want to know more or find out how we might be able to support you further?  
Check out our website: <https://umbrella.org.nz/> - ka kite ano.

## IMechE Mental Health and Well-being

The Chair of C4FF is also the Chair of the IMechE for the Midlands Region and as a follow on from the above helped to arrange a workshop on Mental Health and Wellbeing on 5<sup>th</sup> January 2021. As well as the discussion on PROMETHEAS (not a spelling error of PROMETHEUS) project and its findings so far, a new concept was introduced by IMechE New Zealand on key drivers of stress and how we manage it from a neurological point of view. The concept derives from the Model of Balancing Emotions developed by Paul Gilbert (2020) as per workshop on 16<sup>th</sup> December 2020. His research has found that people switch between three systems – Threat, Drive and Soothe. The concept proposes Skills for Managing Threat, Skills for Managing Drive and Skills for Managing Soothe. More on this at the next meeting of PROMETHEAS, Friday 20<sup>th</sup> February 2021.

## GreenShip



## News

The last partner meeting and multiplier event took place in Athens, Greece in February 2022. And the next meeting is scheduled for 4-6<sup>th</sup> May 2022 in Ljubljana, Slovenia. The final conference and partner meeting is expected to take place in Barcelona on 30<sup>th</sup> June-1 July, 2022.

The multiplier event in Finland was very successful and a great deal positive comments were made about the GreenShip project. The content is considered a major strength of the project. The e-learning aspects of project is being developed by partners and will be ready soon for evaluation in the new year.

This an Erasmus+ project started in October 2019 when the details were published in MariFuture. The kick-off meeting took place in Barcelona on 9-11 December 2019.



**GreenShip Project Team from Spain, UK, Finland, Italy, Greece and Slovenia**

The second partner meeting for Greenship was in the UK on the 27<sup>th</sup> and 28<sup>th</sup> February 2020. This second Greenship Partner Meeting combined a Multiplier Event with IMechE lectures and visit to the Battery production at Warwick Manufacturing Group and a keynote lecture by Professor Ziarati followed up by short presentation by the Partners and guest speakers at Warwick University. The lectures and battery production visit went well.



Figure 1 and 2 (above) is at Warwick University Lecture Theatre with Professor Ziarati and Captain Heikki.



Figure 3 and 4 is of the Lecture Theatre at Warwick University showing Professor German presenting





**Figure 5 and 6 (above) is of the partner meetings based at C4FF, Berkeley House**

The Satakunta University of Applied Sciences (SAMK) has organised an online event on Towards Zero Emissions on Thursday 29 October 2020 at 10.00–13.00. For more information click [here](#)

The GreenShip project is progressing as planned but the third partner meeting in Barcelona had to be cancelled due to the Corona Virus. A meeting was arranged on 25<sup>th</sup> June 2020 to report on the initial work carried out regarding IO 5 followed by IO 6. The postponed second Multiplier meeting which was planned for April 2020 delayed several times to see if a face-to-face event is feasible but due to continued Covid restriction eventually was decided to have it virtually in October 2020.

Since the Multiplier event in the UK partners have met on regular basis virtually and the last meeting took place on 22<sup>nd</sup> of July 2021 at 10:00 CET.

### **Mentor Project**

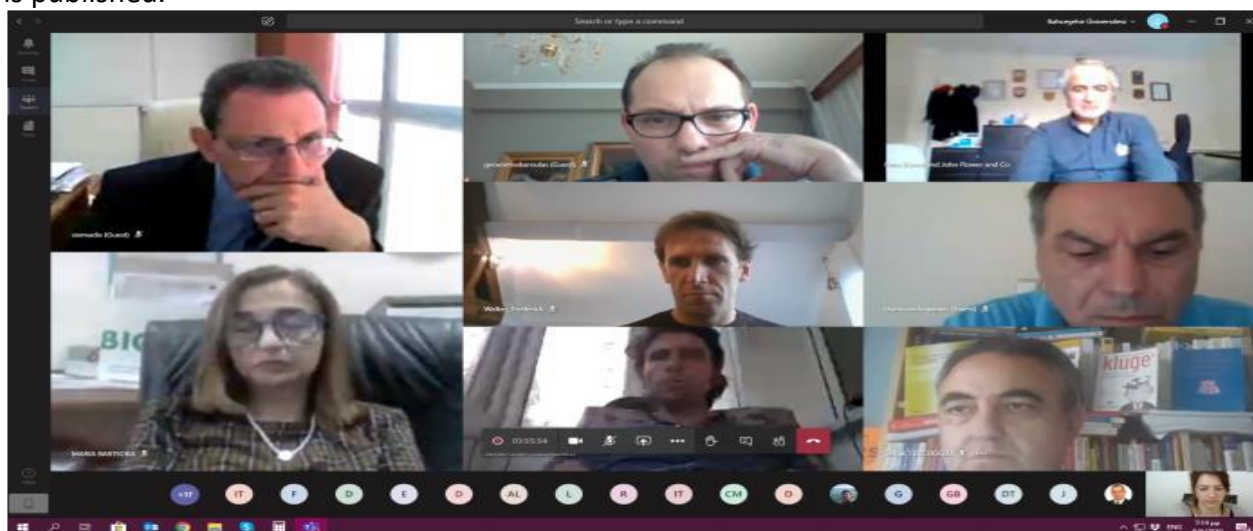
The Mentor project was recently evaluation by the EU assessors and was given a grade of 95% one of the highest ever given. It was rated excellent and an award of 'best practice'. This is wonderful news giving an indication of hard work and dedication of the project partners. Well done all partners.

The #Mentor4WBL@EU Project was designed after the European Council prompted the EU Member States to increase "substantially the number of apprenticeships and traineeships to



## News

ensure that they represent real opportunities for young people, in cooperation with social partners and where possible integrated into education programmes". In addition, according to the newly adopted "European Framework for Quality and Effective Apprenticeships" (October 2017), European Commission identifies 14 key criteria that Member States and stakeholders should use to develop quality and effective apprenticeships. Among the specific criteria, is made a concrete reference on the necessity to exist a specific procedure for teachers, trainers and in company mentors to "update their skills and competences in order to train apprentices according to the latest teaching and training methods and labour market needs". In-company WBL mentors are in the core of quality WBL. However, in most European countries, they lack standardized support and guidance which will set the expectations and boundaries clarifying and ensuring their successful contribution in the learning process. Based on the above and the identification of the WBL needs and gaps by NetWBL, there is a significant need for the development of standards and qualifications that would identify certain knowledge, skills and competences. They should also provide adequate assessment that will lead to valid certification and August 2019 marifuture.org News ensure quality in-company WBL mentorship in enterprises providing apprenticeships and internships. More information about the project will be available on the project website when it is published.



**A snapshot of the virtual Mentor Multiplier Event organised by the Project Lead on 18<sup>th</sup> January 2021**

Since the virtual multiplier event there have been several virtual partner meetings as well as several meetings with specific partners involved in IO 5. The IO 5 is now concluded and work on IO 6 is continuing.

There were regular meetings of partners working on various IOs and as reported earlier the final conference and partner meeting took place online on 18<sup>th</sup> January 2021. The last few weeks the focus of the project has been on preparing an IPR and business model. The final conference of Mentor Project took place on 18<sup>th</sup> January 2021. The conference programme was as follows:





## News

Mentor4WBL@EU

On-line Final Conference

Monday 18/02/2021, 16:00p.m -18:00 p.m.(Central Europe Time)

16:00-16:15 Welcome Speech & Presentation of #Mentor4WBL@EU project by Mr Vassilis Siomadis, Project Manager

16:15-16:30 Presentation of the Course & Syllabus design for apprenticeship and internship in-company WBL mentors (IO1 & IO2) by Ms Jennie kallergi, DIEK AIGALEO

16:30-16:40 Presentation of Certification scheme for workplace mentors (IO3) by Mr Didier Blanc, EFCoCert

16:40 – 16:50 Presentation of the Assessment Development for apprenticeship and internship in-company WBL mentors (IO4) by Professor Reza Ziarati, C4FF

16:50 – 17:00 Presentation of the E-Course Development for apprenticeship and internship in-company WBL mentors (IO5) by Professor Yaman Omer ERZURUMLU, BAHCESEHIR UNIVERSITY

17:00-17:15 Presentation of the IT competence certification platform and the results of the pilot test phase (IO6 & IO7) by Ms Florence Le Lann, Viasyst

17:15-17:30 Presentation of the Exploitation Report by Ms Maria Bartsoka, Head of Unit, IVET Directorate, OAED

17:30-17:50 Q&A

17:50-18:00 Conclusions & Closure

Moderator: Vassilis Siomadis

Official Language of the Event: English



The Partners also had a meeting to prepare for the Conference and also a meeting after to discuss post-funding issues.

As a result of the final conference partners helped in finalising the final report and submitted it the Greek NA on 13<sup>th</sup> April 2021. Once the final assessment is carried out C4FF intends to promote the e-course in Mentorship throughout its network in the UK and later through MariFuture.

Final report of Mentor Project was submitted to the Greek NA at the end of March 2021.



## News

### **PoliUniBus**

The project is progressing well. Partners are having Monthly online meetings to discuss project progress. The next face-to-face partner meeting will be held in Porto, Portugal on 3<sup>rd</sup> - 4<sup>th</sup> of March 2022.

U.PORTO is also organising 2<sup>nd</sup> multiplier event in Portugal on 3<sup>rd</sup> of March 2022. It will aim at presenting the PoliUniBus methodology, cloud platform and the Challenge-led Grading Framework by bringing together students, businesses and relevant government stakeholders. In this workshop, the students will be provided with real life challenges/problems from the partner companies and will be asked to work with partner companies to solve the assigned challenges/problems using the PoliUniBus methodology and platform. Later the PoliUniBus Grading framework will be used to grade students for their activities. The event outcomes will help in the validation of the PoliUniBus methodology & platform and Challenge-led Grading Framework.





3<sup>rd</sup>  
March  
Hybrid  
event

Workshop  
on business-academia-policymakers collaboration



# Healthcare innovation challenges

Porto, Portugal

## 9h15 Opening Session

Prof. Altamiro Costa Pereira  
Head of FMUP

Prof. João Almeida Fonseca  
Head of MEDCIDS

**Turning "Universities without Walls"  
into reality: the strategic role of academia-  
business partnerships**

Prof. Joana Resende  
UP Pro-rector for Planning, Entrepreneurship and  
Knowledge Transfer

## 10h30 PoliUniBus Solution

Cloud Based Platform for  
Policymakers, Businesses  
and Academia Collaboration

## 11h30 Let's try it!

PoliUniBus Live Demo

\* Lunch included  
for on-site  
participants

Hands-on session  
for industry and  
policymakers

## 14h30 Thematic round table Technology transfer challenges

## 16h30 Closing

**CINTESIS**  
Health Research



MEDCIDS  
DEPARTAMENTO DE MEDICINA  
DA COMUNIDADE, INFORMAÇÃO  
E DECISÃO EM SAÚDE

Faculdade de Medicina da Universidade do Porto, Rua Dr. Plácido da Costa, Porto - Portugal

UP  
PORTO

FM  
UP



Co-funded by the  
Erasmus+ Programme  
of the European Union

Project number:  
2019-1-UK01-KA203-062136

Register here



[bit.ly/3HkPc9k](https://bit.ly/3HkPc9k)

**C4FF**  
Developing the Future

**LUT**  
University

**MERINOV**  
TECHNOLOGY CENTRE

**UNIVERSITY OF  
LIVERPOOL**

**actuate**

For more information, visit project website at: <https://poliunibus.org/>

DayTiME Project



## News

The project is progressing well. The partners are having periodic online meetings.

During last semester, C4FF team worked on DayTiMe Standardisation activities i.e., reviewing existing standards in Digital Twin and predictive maintenance domain. C4FF team participated in number of online discussions during virtual meetings with partners as well as several internal meetings. C4FF played an active role in project dissemination through MariFuture platform by publishing monthly generic project progress reports.

For more information visit project website at: <http://daytimeproject.com/>

### INSPIRE Project



**IMechE and C4FF joint New Fan Boat STEM Activity**

### OPTIMUM

The project has had its final review meeting on Thursday 10<sup>th</sup> of June 2021. The meeting was a success. The project aims to support innovative concepts for engineering, commissioning, control and supervision of smart manufacturing and material handling. It will be in line with European, National and international initiatives towards digital manufacturing, closely related to on-going activities in working groups around the German initiative Industry 4.0. Taking the results from ongoing architectural, component and ontology discussions, OPTIMUM's major goals are: improvement of the aspects of distributed control, adaptation of (I)IoT technologies to real industrial needs, enhancement of control and applications by context and location awareness as well as application design and common-model based 3D engineering and supervision.

For more information visit project website at: <https://www.optimum-itea3.eu/>





## News

### School pupils 14 years old and over Climate Action Competition

#### CW-AQPC, C4FF and Inspire Group Joint Climate Change Competition

We have a challenge for you!

A simple assignment after which your students answer quizzes. Then submit their answers to Professor Reza Ziarati at [reza.ziarati@c4ff.co.uk](mailto:reza.ziarati@c4ff.co.uk). Areas covered are:

#### Emissions Overview

- Climate System and Global Warming
- Greenhouse Gas (GHG) emissions and Climate change
- Main GHG Emissions The main GHGs heat-trapping gases
- Climate Change Impacts on Oceans
- Combating Air Pollution: The Role of International Bodies
- Growth of Concern on Air Pollution
- Historical Developments
- The United Nations Environment Programme (UNEP)
- Intergovernmental Panel on Climate Change (IPCC)
- The United Nations Framework Convention on Climate Change (UNFCCC)
- The Kyoto Protocol

The winning school will get £250, and a Certificate along with the winning students getting £100 each together with a Certificate. The students plus their teachers (2 Max) will be invited to our Annual Dinner event as our guests.

Our aim is for Schools to encourage both girls and boys to take part and hence can submit two entries one each from a female and a male student.

The winners will be announced at our Air Quality group conference in September/October 2021

To join the competition along with information on prizes please contact me [reza.ziarati@c4ff.co.uk](mailto:reza.ziarati@c4ff.co.uk).

I look forward to hearing from you,

**Prof Reza Ziarati**

#### Latest Events

Air quality group Conference is scheduled for 14<sup>th</sup> October 2021. This conference will take place at Coventry University and will involve the key stakeholders throughout the greater Midland region; more on this in the intended next up-date of News expected in late August.

#### The Government's Response to C4FF on Matters Raised by the Centre about Pollution

In response to C4FF's efforts in helping to improve air quality, the Department for Environment Food and Rural Affairs, Secretary of State, Rt. Hon. George Eustice replied to Professor Ziarati with





## News

assurances that the Government is committed to tackling air pollution UK wide and huge progress has already been made in reducing emissions. Air quality has improved significantly; however, it remains one of the most persistent public health challenges of our time. Our understanding of the range and scale of health effects associated with air pollution is constantly improving and Defra continues to have extensive discussions with the Department of Health and Social Care and the research community on the relationship between air quality and health.

### **Government Recent Efforts – Climate Assembly UK: the Path to Net Zero**

In a letter to Professor Ziarati, the Prime Minister, with regards to the advisory and academic panels working towards zero emissions, states that it is testament to your hard work that so many talented individuals and organisations from across the UK are involved.

As the UK's first citizens' assembly on climate change prepares to meet for the first time at the end of January, the two panels of stakeholders and researchers helping to ensure the balance and accuracy of the assembly have been announced.

### **A short report from Chair of Air Quality People's chamber, Professor Reza Ziarati to COP26 Working Group**

Energy cannot be produced or destroyed but can be transformed from one form into another.

Higher temperatures have negative effects, and the higher CO2 emissions the higher is the atmosphere's temperature. We need to bring CO2 emissions to Zero if the global atmospheric temperature is to remain unchanged.

We have two choices, either stick to transport issues or go to the core of the problem namely, what it takes to containing the global warming within 1.5 degrees. The CO2 is still rising and global warming is getting worse.

As with Covid, climate change challenge should start with the Challenge the UN Paris Accord Climate Emergency to contain global warming within 1.5 degrees. So the Challenge is clear. Now that we know what the challenge is we must start from the science based facts from which we, as Engineers, will determine the appropriate solutions. It is suggested that Engineers may identify the appropriate solutions, but governments and businesses – hopefully with the concurrence of local councils, parliaments and peoples - will determine the adopted solutions].

Further more like the pandemic the solutions will only be successful if the whole society is helped to understand it and fully won to engage. A great example is the symbiotic relationship emerging in the USA on both these global challenges with progressive people power in tandem with progressive business and government.

It could be said the quickest and cheapest way to transition towards achieving the 50% carbon reduction by 2030 climate emergency on the road to net zero is leadership from government complemented locally with public, private and third sector local partnerships.

It should be noted that the progressive governments are convinced and the UK 2014 Road Map to a Brighter Future strategy is a good policy. What is now the game change is the election of a US President and Senate and Congress majority implementing this as opposed to the Trump sabotage.



## News

Our research (C4FF) shows that to achieve UK 2014 Road Map to a Brighter Future, it is imperative to replace all of the fossil fuels we use with clean, green energy for power, heat and transport which is now commercially competitive. Carbon reduction requires the combination of energy/resource efficiency together with generating 100% of clean green power, heating and transport fuel which this project can contribute to including reducing carbon in the local environment with adverse impact on the people's quality of life as well as reducing premature death and morbidity which have a costly impact on the health system (NHS in the UK).

Capacity of building of local communities to help them develop, implement and sustain their solutions should be an important consideration.

It is imperative to help popularise the science of the climate emergency along with the range of clean green solutions solution essential for citizen and community engagement. Regular forums knowledge exchange, collaboration and partnership across all civil society organisations are essential. Particular attention should be given to school students using the STEM curriculum including using the school building for them to undertake a not only a solar mapping but what else is required to make theirs a zero carbon school.

It has to be appreciated that reducing the use of fossil fuels in power stations will greatly reduce emissions and will ease the pressure on transport system.

Furthermore, currently we are driving around with a 5% Ethanol blend in our petrol, right now; the EU target is to get that up to 10% when they can make enough; and the diesel is 7% Bio-Diesel made chemically from rapeseed, sunflowers and so forth. Most of the UK's ethanol is imported, mainly from USA, because we are so 'overcrowded' here that we cannot grow enough food, never mind grain for ethanol on top; this is called the 'fuel vs. food problem'. In the USA, something like **10%** of the total 'grain' (maize) crop is now turned into ethanol fuel.

### Issues relating to transport

The average price of Electricity in US dropped from \$2.5 in 1900 to \$0.1 in 2020 (\$ per kWh at 1990 prices). In fact the average price of electricity has dropped rapidly in the Western world and in many countries worldwide albeit not at the same rate as in the West. Yet, global carbon emissions from energy transformation have gone up from Zero in 1850 to almost 35 Gigatonnes in 2020. There has been almost a exponential rise in CO2 level. This is alarming. 26 billion tons of CO2 per year; more tons/person in the West/developed world and a lot less tons/person elsewhere, on average 5 tons per person worldwide. This is unacceptable.

The CO2 emissions are directly proportional to world population (P), CO2 per unit energy (C), Services per person (S) and Energy per service (E), namely:  $CO_2 = P \times S \times E \times C$ . If P goes up S will go up too but although E may drop and this may lead to a lower C, the anticipated increases in population and current upward trend for greater need for Services would mean huge increases in CO2. So far CO2 levels have not been falling and we need a miracle to reduce CO2 level to maintain a safe global temperature.

There are no easy solutions. Wind, Solar and Hydrogen have huge problems of transmission and storage but the cost of transformation of free wind and solar energy to clean and usable energy is falling. One solution could be Nuclear and use of small, safer and highly efficient units spread





## News

over the globe rather a few numbers of huge power plants. In any case, Nuclear energy has its problems of cost, safety and long term storage. Another partial solution is carbon capture and its storage which poses serious engineering challenges of affordable cost, suitable locations and long term stability.

One method suggested by C4FF was conversion of wind energy to potential mechanical energy (Reza's Coil) and its storage. This one potential area which can have a huge potential as it removes the storage problem of wind energy.

On electrical energy all the batteries on earth can store about 30 minutes of the world's energy needs. There is a great deal about cars. Toyota which is the world's largest automakers, this week, reiterated an opinion it has offered before. That opinion is straightforward: The world is not yet ready to support a fully electric auto fleet. Just 2% of the world's cars are electric at this point. There are 289.5 million cars just on U.S. roads as of 2021. About 98 percent of them are gas-powered. Toyota selling 81% of its cars in the US warns that the grid and infrastructure simply are not there to support the electrification of the private car fleet. A 2017 U.S. government study found that we would need about 8,500 strategically-placed charge stations to support a fleet of just 7 million electric cars. That's about six times the current number of electric cars but no one is talking about supporting just 7 million cars. We should be talking about powering about 300 million within the next 20 years, if all manufacturers follow GM and stop making ICE cars. 300 million cars is still a drop in ocean and who is here in 20 years time.

There is no free lunch. Electrifying the auto fleet will require a massive overhaul of the power grid and an enormous increase in power generation; hence, the reason for success of Hybrid. Read award prize winning and given a national diploma award Ziarati (1995) paper to know why the time for hybrid vehicles is with us -

[http://www.c4ff.co.uk/history/papers/Emerging\\_transportation\\_system.pdf](http://www.c4ff.co.uk/history/papers/Emerging_transportation_system.pdf) .

I believe the Government is saying the right things and doing a great deal of good, however the problem is that of strategy. We need to set up a strategy for most sustainable means such as reducing energy demand by reducing consumption and energy use followed by energy efficiency and utilisation of renewable and sustainable resources. The logic also dictates that the focus should also be on the least sustainable means such as utilisation of other low GHG-emitting resources as well as utilisation of conventional resources. The methodology in treating raw data on air quality and presenting it also is a cause for concern. We should pay greater attention to producing evidence; currently, there are a number of factors being used to amend raw air quality data which defies logic. Using and reporting on raw data from the diffusion tube measuring NO<sub>2</sub>, for instance, are cases for serious consideration. DEFRA officials and Ministers including Secretary of State overseeing the work of DEFRA are aware of my views on this subject.

The Policy Paper on Clean Transport, the Environment Bill, the draft industrial strategy report and work on an innovation strategy as well as DEFRA's three identified research ideas are all a way forward but several key points are worth being considered. I have already given my views to senior ministers in the Government on these key issues.

We must all do whatever we can to save our planet for our next generations. The role of any advisor should be to explain the fundamental Engineering and Scientific truth with the hope to



## News

enact better policies. I have some doubt about current AQEG to have sufficient and over embracing expertise of the realities viz., CO<sub>2</sub> emissions are still rising and global warming is getting worse. Particularly considering that the Government is not meeting its own air quality targets and yet intends to adopt WHO levels for key pollutants. The future is stark and this is why I am showing interest

### **RZ Solutions:**

A major programme of reducing car journey and encouraging modal shifts from cars to bikes and from air to rail.

Electrification of the rail and re-use of existing tracks and development of massive rail tracks for the expansion of the rail.

Massive installation of solar panels on flat roof tops, car park and so forth.

Continuation with wind turbine instillation including R&D on more efficient units such as C4FF's twin bladed wind turbines

Massive investment in tidal and wave energy

Switch to hybrid propulsion system to counter air quality in cities and towns

Discourage the use of LNG until means have been found to reduce Methane emission some 100 times worse of CO<sub>2</sub> with regard to its impact on global warming.

Encourage local small highly efficient nuclear power station using U238.

Reconsideration of using Ammonia for larger propulsion systems and use of Ethanol and Methanol in Internal Combustion Engines.

Apply RZ's Coil (Inertia wheels) to wind turbines to store energy

Encourage local stakeholder collaborations

Involve schools in climate change projects see attached IMechE Midland examples.

Invest in invention and research in energy efficiency and technologies to reduce emissions of harmful pollutants.

**Dr Martin Ziarati**