



## **June/July 2021**

As reported in the previous news, 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 2021.

### **Cyber Space Projects**

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 the complexity of computer systems and networks and become cyber security safe.

In parallel, C4FF with support from several other organisations has become involved in a project which 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 the UK and across Europe.

C4FF is an SME with 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 the 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. 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 will also benefit from this outcome of ENTA research work.

ENTNA has already been approved and Cyber Space is also expected to be approved by the UK Government soon.

### **Life SkillsVR – 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**



## News

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.

Our proposed project aims to solve the problem of giving youths 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.

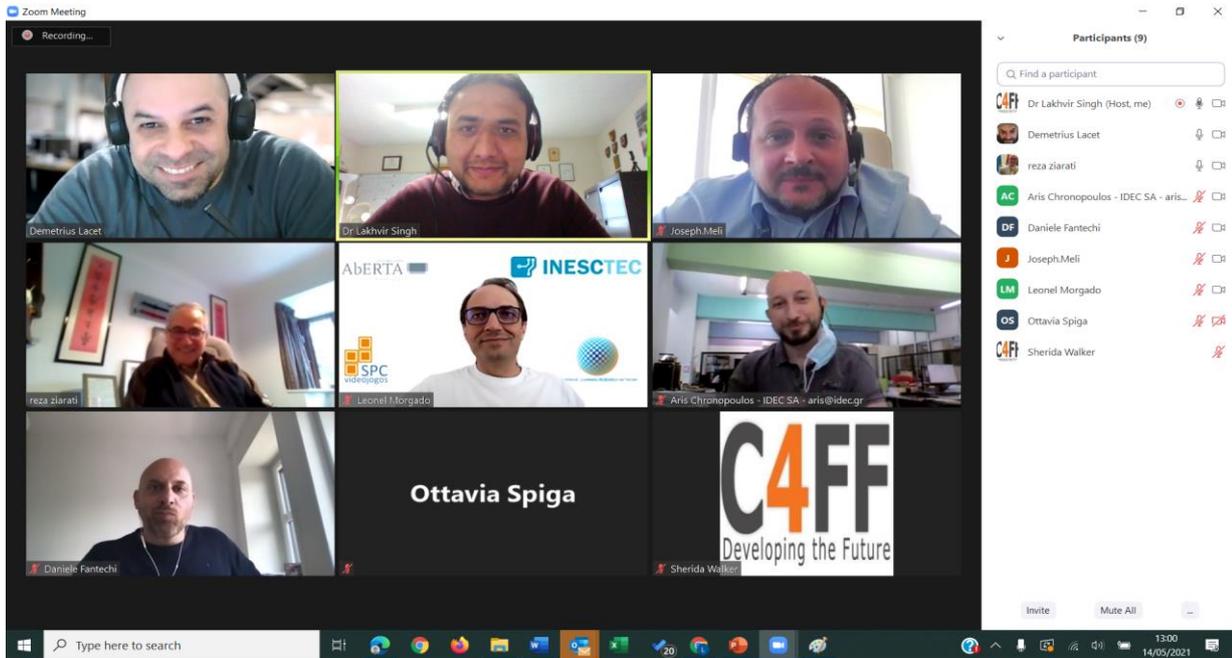
The VR proposed solution will have many more applications providing 3D visualisation of technical or non-technical information for learning new situations, acquiring new skills or simply helping us to navigate a new location or perform our jobs better. It can be used as a ship or boat simulator or navigation 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 helping us have 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.

There have been several developments since last News in April/May 2021. The new university building has been delayed due to Covid but it is expected that new laboratories will be commissioned at the new building once completed. The air quality centre, STEM Centre and Cyber Centre are expected to be housed in the new university building. C4FF has an unrivalled track record of success with all its past and present funded projects, many awarded as 'Best in Europe' and all with high score for the proposals and/or for project delivery.



## News



### Life Skills VR Project Soft Launch on 14<sup>th</sup> of May 2021

#### Corona virus

The problems associated with Corona Virus continue to have an impact on C4FF 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 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 new projects has also been agreed.

#### Key Announcements

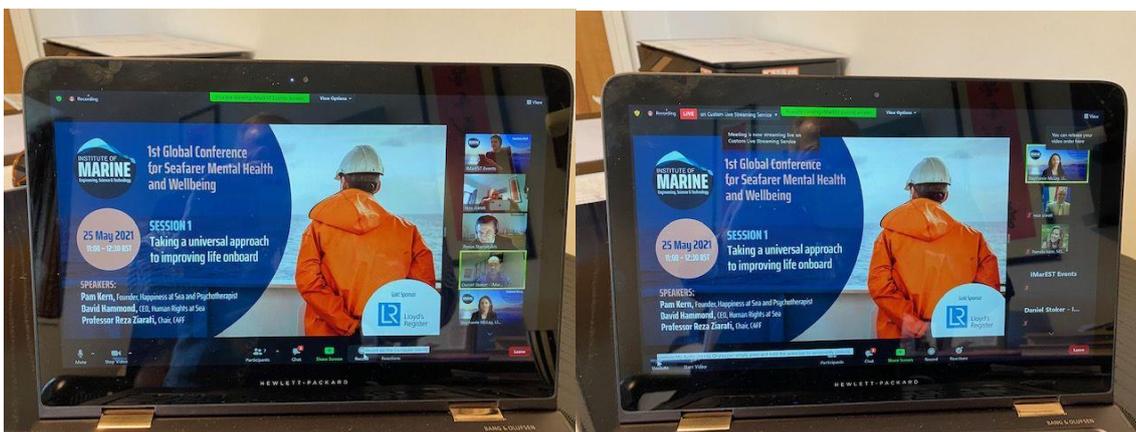
C4FF is in the process of continuing its work on the successful SeaTALK and renew the accreditation of its e-course with IMarEST as a CPD. As reported in last month's News, C4FF's University Centre (Garden City) supported the development of two new courses in Technological Innovations and Research Methods. 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.



### 2021 Year of Seafarers Mental Health and Wellbeing

MariFuture continued with the publication of a Development Paper on efficient ship each month throughout 2020 in support of the 'Year of Efficient Ship' due to the importance of the subject in order to make our members and partners aware of the impact of toxic pollutants from shipping; and the means available to us to reduce the level and amounts of the emissions from ships to a minimum level. 2021 is the Year of Seafarers mental health wellbeing and MariFuture will publish a series of Development Papers and Articles in support of this initiative.

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 is PROMETHEAS Project - Mental Health Data Research Hub for Seafarers. This was presented at 10:30AM BST on Tuesday 25<sup>th</sup> May. For further information about this event please see [1st Global Conference for Seafarer Mental Health and Wellbeing](#).





The Prometheas Partners have also prepared a paper for presentation at TranNav, a major event in Poland. More information about this conference can be found at [The conference: https://transnav2021.umg.edu.pl/](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 in the next News update.

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

### Funded Projects

**PROMETHEUS** - This proposal was accepted in mid- August 2019 and concerns the mental well-being of ship crew. The project was expected to start in October 2019. The first meeting of the partners was on the 18-19 November 2019 in Athens and was attended by Katie Parker (Research Officer) and Professor Ziarati. The partners have meet on regularly and next meeting is planned for 30<sup>th</sup> April 2021. Partners have also prepared the first Interim Report and this to gether 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 Prometheas course and prepared a Learning and Assessment strategy for the Course. Several quizzes were prepared for the partners' considerations. The partners have agreed to work on the draft and produce the more content and quizzes.

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 the Covid pandemic . Professor Ziarati asserted that recent studies show that Fatigue is by far the greatest factor affecting seafarers' mental wellbeing and that the only organisation that can help and provide an immediate response is IMO. Unfortunately IMO has been very slow as it is composed of national administration 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.

## **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.

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.



## News

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: CaptPanosStavarakakis 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 CMarEngFIMarEST, 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, 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?
- 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 will take 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.
- arEST 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)



### Outcome of Prometheus Multiplier Event in Finland

As reported the two-day multiplier event run in Finland by Prometheus 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 Prometheus 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?

**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.

Figure 1: Paul Gilbert, Compassion-focused therapy

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.

### Formation of Special Interest Group (SIG)

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 Prometheas findings so far.

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 a 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



### GreenShip

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.





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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



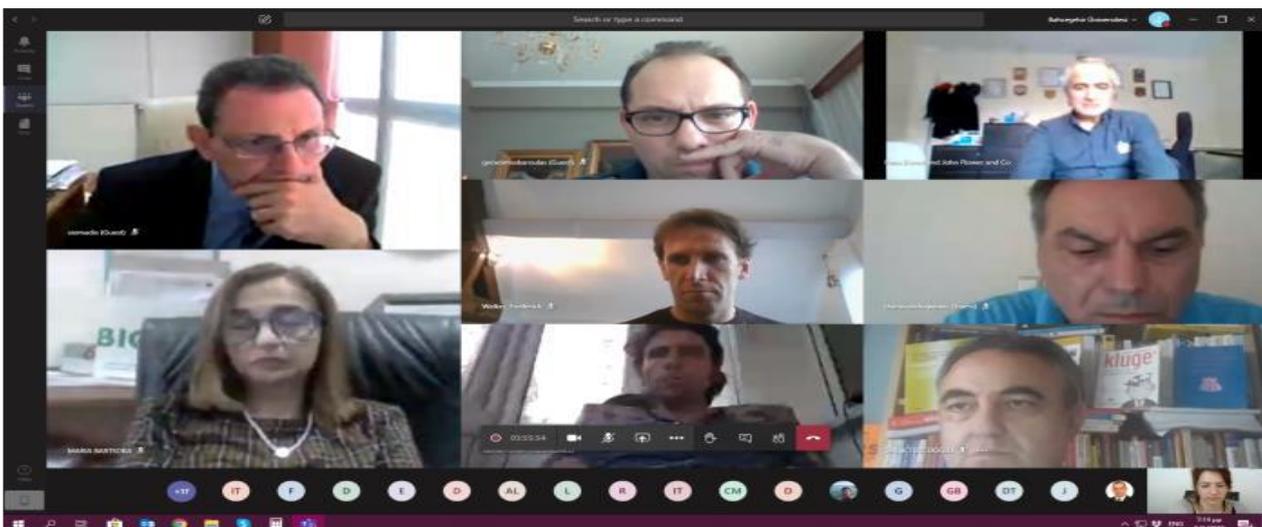
The Satakunta University of Applied Sciences (SAMK) has organised an online event on Towards Zero Emissions on Thursday 29 October 2020 at 10.00–13.00. For more information click [here](#)

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 recently have been working to prepare the first interim report

### Mentor Project

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 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



## News

Since the virtual multiplier event there have been several virtual partner meetings as well as several meetings with specific partners involved in IO5. IO5 is now concluded and work on IO6 is continuing.

There have been regular meeting 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. During the last few weeks the focus of the project has been on preparing an IPR and business model.

Mentor Project was concluded on 31<sup>st</sup> January 2021. The final conference of Mentor Project took place on 18<sup>th</sup> January 2021. The conference programme was as follows:



[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



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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 to 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.

### **PoliUniBus**

The project is progressing well. Partners are having Monthly online meetings to discuss project progress. Dr Lakhvir Singh from C4FF updated the partners about Richard who has left the University of Liverpool (UoL) and the project. C4FF team is in touch with the UoL. UoL has no objection in principle for C4FF to manage the project although a modus operandi has to be agreed and the UKNA blessing is sought.

However, C4FF will clarify with the UoL about contractual details about the project.

C4FF has appointed Professor Reza Ziarati as a Project Manager and Ms Sherida Walker as Assistant to Professor Reza to support the overall management of project until further notice. If all goes as intended a revised budget and how to share UoL work will be prepared by C4FF with support from UoL.

Partners discuss the progress of the Intellectual Outputs (IOs). IO1 Needs Analysis Report is progressing well and C4FF has sent its report to partners for review and the expectation is that the partners will review their report at the same time and let C4FF have it back by 15 February 2021.

There has been good progress with regard to IO2 namely, Development of Challenge-led Methodology. Some of the partners have drafted their report and it is expected that all reports will be forwarded to C4FF by 5th March 2021.

It was reported that good progress has been made on IO5. This has helped in making sure what is produced in IOs 1, 2, 3 and 4 are compatible with the developments intended within IO5 and later with regard to IO6.





**The Project Team from UK, two organisations from Finalnd, Turkey and Portugal**

**DayTiME Project**

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/>



**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 meetings are taking place every month. The last meeting took place on June 10th 2021.**

**Air Quality latest Joint Proposed Project with Coventry University**

1. Investigation into the Global State of Air Quality Monitoring and Measurement, Informing the Centre for Factories of the Future for the Design and Manufacture of a Mobile Air Quality



## News

Monitoring Unit. It would be good to form a new team to continue with this project. Samuel and his team did an excellent job last year. His participation in the Blue Sky Seminar was also commendable. We would like to nominate him for a C4FF prize to be presented at the next Midland Engineering Dinner event. Participants of the IMechE Design prize would all receive a complimentary dinner ticket, paid for by C4FF to the next Midland Engineering Dinner as was the case last year.

2. Investigation into the Low-Cost Air Quality Monitoring and Measurement Systems, Informing the Centre for Factories of the Future of Their Accuracy and Precision in Comparison with the Standard Systems Used by the UK Government.

There are two other projects:

3. The project is expected to tackle the climate change actions at the core. Cleaner air necessitates the use of ever increasing greener energy for all key related sectors and industries such energy transformation, transport, agriculture and food as well as manufacturing and built environment (Ziarati, 2010b)<sup>[1]</sup>. Education also plays a major part and hence involving local universities and schools in an important consideration in this proposal.

The project primarily concerns the measuring and monitoring pollutants indoors such as offices, schools and in homes as well as inside cars, trucks and buses but the intention is also to use dual air quality sensors for measuring pollutant levels in several pilot outdoor sites such as outside schools with a view to measure and monitor the air quality and find ways to mitigate the adverse impact of poor air quality on our health, both inside and outside. Through stem activities the project will be promoted in primary and secondary schools through the existing networks ([www.inspire-group.org](http://www.inspire-group.org)).

The sensors that will be used will be as accurate and precise as DEFRA ones but a lot cheaper. These sensors are developed by a group of highly competent organisations and individuals and tested in cities such as Oxford. One would be installed next to a DEFRA air quality monitoring station in Coventry for comparison and calibration purposes and two or more in indoor pilot sites. In parallel a set of sensors developed as part of a STEM activity by 16+ students will be installed alongside the more accurate sensor and DEFRA's for comparison purposes and for providing an R&D support to the STEM project for its further development.

While measurements are taking place, the system installed will be configured to a cloud environment and using Artificial Intelligence (AI) by applying predictive techniques, trends and patterns will be studied. C4FF has established that there is correlation among several key pollutants. The proposed system will be able to capture any data available to populate the air quality grid over a city or an area and predict pollution levels indoor and outdoor and provide feedback on actions that could reduce the level of one or more pollutants.

4. Design and Development of Novel Twin Wind Turbines

The Dual rotor wind turbine will have two rotors, one at the front and one at the rear of the wind turbine. It is expected to offer a higher efficiency and therefore a way forward in renewable energy transformation. A recent C4FF study states that dual rotor wind turbines are superior to single rotor wind turbines and these scientific researchers prove that dual rotor wind turbines can generate 50% more energy (in kWh) in a year. The difference is remarkable. Since dual rotor wind turbines are a fairly new subject there are not any commercial dual rotor wind turbine on the market. The subject is still at the academic level. Bringing the subject of dual rotor wind turbines from academic level to industry level is a challenge and it promises a great deal to offer. This

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<sup>[1]</sup>[http://www.marifuture.org/Publications/Articles/RZ\\_Air\\_Quality\\_2020\\_Article.pdf](http://www.marifuture.org/Publications/Articles/RZ_Air_Quality_2020_Article.pdf)



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project proposes design of a dual rotor wind turbine, made and tested at Coventry University with C4FF support. In the literature there are several different dual rotor wind turbine configurations. In this project we propose to design and make a mobile 30 kW counter rotating wind turbine. The application for such a device is substantial and can be installed to provide electricity in rural areas worldwide.

### **Coventry University Students Project**

Three groups of students have been working on the twin blade wind turbine initiated by C4FF. Professor Reza, C4FF Chair supervised the industrial advice on this project. Two wind turbine engineers from Siemens attended a workshop with students and engaged with the project. Members of Air Quality group with experience in climate actions projects attended another workshop with the students. The final meetings took place on 1<sup>st</sup> April 2021. The student groups are now expected to work on their final report. Siemens engineers also provided written answers to several questions raised by the students.

### **New Projects**

Several new project proposals were prepared and submitted on time. Due to the confidentiality of these projects no mention of some of these will be made until C4FF is informed of the results. Two of the proposals are EU related and several countries have agreed to participate in these projects. It is important to note that the UK can still participate in EU funded projects until the end of the year.

C4FF with support from Surrey University, Bytronics and Coventry University is preparing an R&D project proposal for the Government's consideration.

### **Coventry University students-CWAQPC-C4FF Air Quality Project**

The project concerns an investigation into Global state of air quality monitoring and measurement informing the design and manufacture of an Air Quality Measurement Station. There are two groups of students. C4FF and CW-AQPC are seen as the clients. The project is student project and is expected to come up with a specification for design of the measuring station. Both groups recently made a presentation to their academic Supervisor, Professor Paul green and Professor Ziarati. So far both groups have made good progress.

### **The UK Government Response to C4FF Concerns regarding EUREKA and EU Funded Education and Research Programmes**

A letter has been sent to the Prime Minister in response to the letter to C4FF by Mr James Duddridge, MP, Parliamentary Undersecretary of State, BIES, asking him to review the two recently awarded EURKA projects and help C4FF to receive the grants expected. In a previous letter to Professor Ziarati, the Minister had made assurances that the Government would be supporting EUREKA approved projects and more funds would be allocated to this novel programme. In an earlier letter he reassured Professor Reza Ziarati that the UK would continue to participate in EU annual budgets including 2020. This means that the Government will continue to make contributions and get receipts from EU budget programmes under the normal rules. All EU projects and programmes, including Erasmus+, will be financed as foreseen under the current Multiannual Financial Framework (2014-2020). This provides certainty to all beneficiaries of EU programmes, including UK beneficiaries. They will continue to benefit from EU programmes until their closure. C4FF is waiting to hear from Downing Street.

### **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 assurances that the Government is committed to tackling air pollution UK wide and huge progress has already been made



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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.

Dr Martin Ziarati