



HIGHER EDUCATION AND RESEARCH COLLABORATION ON NANOMATERIALS FOR CLEAN ENERGY TECHNOLOGIES - 2.0 (HRNCET - 2.0)

BOOKLET ON HRNCET-NORPART PROJECT JOURNEY 2022 – 2026



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The overall objective of the HRNCET 2.0 project

The overall objective of HRNCET 2.0 is to enhance the quality of higher education in Norway and Sri Lanka in nanomaterials for Clean Energy Technologies (CET) by reinforcing and expanding the existing collaboration among partner institutions by (a) developing a new sandwich PhD programme, (b) expanding the collaboration on master level within CET and (c) incorporating partnership with the private sector in the education and research collaboration.

HRNCET 2.0 aims to strengthen the collaboration between the partner institutions, Western Norway University of Applied Sciences, University of Bergen, Norway, Coimbatore Institute of Technology, India, and the Universities of Peradeniya & Jaffna, National Institute of Fundamental Studies in educational and research activities, and implement student and staff mobility within the field CETs.



Messages

Message from the Vice Chancellor, University of Jaffna

People of Norway and the government of Norway have long standing fruitful relationship with people of Sri Lanka. People of Sri Lanka are ever grateful to people of Norway and government of Norway for their immense contribution in providing technical and financial support for many development projects in Sri Lanka especially in the marine and energy sectors for more than last four decades. University of Jaffna is a relatively young Higher Education Institution, inaugurated in 1974, growing fast and providing undergraduate and postgraduate education in many disciplines including Science, Technology, Engineering and Medicine (STEM). As a consequence of unsettled conditions prevailed in the region for more than last three decades, UoJ suffered and had limited infrastructure and laboratory development. With the end of the conflict in the last decade, UoJ has been seeking for collaborative research engagements with other universities both in Sri Lanka and abroad to catch-up the contemporary developments. In this respect, NORPART project collaboration between UoJ and HVL, worth of many million LKR, inaugurated in 2017 and running over the last five years, is a blessing to the UoJ to erect state-of-art laboratories and technically resourceful personals. NORPART-HRNCET project outcome has drawn the attention of energy industries and authorities due to its novel findings in solar cell design, floating panel generators, and related higher studies in clean energy production. UoJ is happy that based on the performance of HRNCET project in the last five years, Norwegian government has chosen the project proposal HRNCET-2.0 of UoJ and HVL as one of the sound proposals to receive substantial financial support among the highly competitive proposals submitted. In this regard, UoJ is grateful to Prof. Dhayalan Velauthapillai for masterminding the project development by engaging the Scientists of HVL and UoJ. Right knowledge is the ultimate solution for all the problems. Lord Krishna said "Little advancement of knowledge may save you from the greatest fear of life" in this regard the success of HRNCET project is a testimony for catering the future generation with clean and sustainable energy generation. On behalf of the Sri Lankan project partners at the UoJ, I wish to express my sincere gratitude to Norwegian ambassador Her Excellency Trine Jøranli Eskedal and Pro-Rector of HVL Prof. Gro Anita Fønnes Flaten and their team for gracing the inauguration of the HRNCET-2.0 project which would be running for another five years from 2022 to produce research personals through PhD programmes.

All glories to God.

Professor Sivakolundu Srisatkunarajah
Vice - Chancellor, University of Jaffna



Message from the Rector, Western University of Applied Sciences

The UN's 2030 Agenda for Sustainable Development identifies 17 global goals, including Goal 7: ensuring access to affordable, reliable, sustainable, and modern energy for all. Both Norway and Sri Lanka are committed to these ambitions, and as higher education institutions, we share a responsibility to support our countries' pathways toward carbon neutrality by 2050. Our long-standing collaboration, now spanning almost 9 years, between the University of Jaffna and Western Norway University of Applied Sciences (HVL) has made meaningful contributions to this mission, particularly through joint education and research in clean energy technologies. We have been fortunate to host many Sri Lankan students at HVL, whose contributions have strengthened both our research output and the international academic environment in Bergen. Amid today's global energy crisis, the need for a green transition is more urgent than ever, and advancing knowledge in new energy technologies is essential. We are especially proud to have successfully integrated private-sector partners into our collaboration, leading to Sri Lanka's first floating PV installation powered by Norwegian technology. Throughout the project period, we have facilitated visits by academic and industry partners from Norway to Sri Lanka, delivered clean energy seminars and workshops, and supported an international conference. Public awareness is critical for a smooth transition to green energy, and our students and staff have actively engaged in outreach activities in both countries. Through the NORPART project HRNCET 2.0, we have strengthened our educational and research partnerships, expanding our network with the University of Bergen, the University of Peradeniya, NIFS, and private-sector partners in Norway and Sri Lanka. On behalf of HVL, I extend my sincere gratitude to the University of Jaffna for our close cooperation over the years and look forward to continuing this important collaboration in the coming years. We also thank HK-Dir and the NORPART programme for supporting this second phase of HRNCET.

Professor Gunnar Yttri
Rector, Western Norway University of Applied Sciences



Message from the Coordinators NORPART-HRNCET 2.0 project

In 2017, the Western Norway University of Applied Sciences (HVL) and the University of Jaffna (UoJ) jointly secured multiple grants from the Directorate for Higher Education and Skills (HK-Dir), formerly DIKU, and the Royal Norwegian Embassy in Sri Lanka. These supported initiatives from 2017 to 2022 aimed at strengthening higher education and research collaboration in Nanomaterials for Clean Energy Technologies (HRNCET), alongside capacity building and the establishment of a research consortium (<http://project.jfn.ac.lk/hrncet/>). The first phase concluded in 2022, surpassing expectations despite challenges posed by the COVID-19 pandemic. Building on this strong foundation, HRNCET 2.0 was launched under the Norpart programme in 2022 to further enhance the quality of higher education in Norway and Sri Lanka in the field of nanomaterials for Clean Energy Technologies (CET). The project focuses on two main components: A) establishing a new sandwich PhD programme, and B) expanding master-level collaboration in CET, including stronger engagement with the private sector.

HRNCET 2.0 strengthens cooperation among partner institutions—HVL and the University of Bergen in Norway; the Coimbatore Institute of Technology in India; and the Universities of Peradeniya and Jaffna, together with the National Institute of Fundamental Studies. Student and staff mobility remains a priority, enabling enriched academic and research experiences across partner universities. The project has significantly advanced academic collaboration between Sri Lankan and Norwegian institutions. Through coordinated initiatives, HRNCET-NORPART 2.0 has improved academic quality, expanded research output, and enhanced institutional capacity in clean energy technologies. A key achievement has been strong support for advanced academic training. Several Sri Lankan students completed PhD and Master's degrees at HVL and UiB, producing impactful scientific contributions. Jointly supervised PhD candidates published 5 to 9 SCI-indexed papers each, reflecting high research standards and substantial growth in postgraduate research capability. International mobility represents another major success. The first cohort of full-degree Master's students graduated in 2024, laying a foundation for continued exchanges and access to cutting-edge facilities and global research environments.

The Third International Conference on Advanced Nanomaterials for Clean Energy and Health Applications (AMCEHA 2025), organised at the University of Jaffna in March 2025, marked a major milestone for the NORPART collaboration, bringing together over 400 participants, including 140 international experts. The conference strengthened global partnerships in nanomaterials, clean energy, and health technologies while showcasing the research capacity of HVL, UoJ, and partner institutions. It facilitated high-level knowledge exchange, joint project discussions, and new networks that will directly support ongoing education, research, and capacity-building efforts. AMCEHA 2025 also enhanced Sri Lanka's visibility as an emerging hub for advanced materials research.

Research capacity building formed a central pillar of HRNCET 2.0. Seminars, workshops, laboratory visits, and collaborative activities facilitated sustained knowledge exchange, improved research skills, and introduced international best practices to Sri Lankan institutions. The project also delivered meaningful outreach and community engagement. STEM-based competitions, school programmes, and educational initiatives benefited hundreds of students in the Northern Province, inspiring interest in clean energy technologies among young learners.

Overall, HRNCET-NORPART 2.0 has strengthened international partnerships, expanded national research capacity, produced high-quality academic outputs, and delivered long-lasting educational impact across Sri Lanka, demonstrating the transformative potential of sustained global collaboration.

Professor Punniamoorthy Ravirajan, University of Jaffna
Professor Dhayalan Velauthapillai, Western University of Applied Sciences



1.0 Launch of the second phase of the HRCNET project:

1.1 University of Bergen: A new collaborative partner

The launching ceremony of the new project on Higher Education and Research in Nanomaterials for Clean Energy Technologies (HRCNET 2.0), a collaborative initiative between the University of Jaffna (UoJ) and the Western Norway University of Applied Sciences (HVL), was held at the UoJ Auditorium on 6 April 2022. The HRCNET 2.0 project represents the second phase and extension of the original HRCNET project (<https://hrcnet.jfn.ac.lk/>), which was first awarded in 2017 under the Norwegian Partnership Programme for Global Academic Cooperation (NORPART). This new phase further expands the collaboration by including the University of Bergen (UoB). Furthermore, the project aimed to strengthen the existing collaboration between the partner institutions in the field of nanomaterials for energy technologies and to establish a clean energy consortium that includes private enterprises from Norway and Sri Lanka.



On the arrival of the delegation from Norway consisting of academics and researchers from HVL, the University of Bergen (UoB) and the Norwegian industrial partners to the university of Jaffna, the inauguration commenced with the lighting of traditional oil lamp and welcome dance performed by the students of the Department of Music, Ramanathan Academy of Fine Arts, University of Jaffna. The delegation appreciated the excellent dance performance.



Prof. Øyvind Frette, Vice- Dean from UiB and Prof. Lise Bjørkhaug Gundersen, Vice Dean from HVL also addressed the gathering and congratulated all those involved in the project for the successful implementation of the project

The Vice-Chancellor of the university of Jaffna, Prof. Srisatkunarajah addressing the gathering, thanked the engaged universities and the donors for a successful collaboration. He expressed his sincere gratitude to Norwegian ambassador Her Excellency Trine Jørnli Eskedal and the team from HVL, UiB and private sectors for gracing the inauguration of the HRCNET-2.0 project which would be running for another five years from 2022 to produce skilled research personals through PhD programmes.





The Vice-Rector for Research at HVL, Gro Anita Fønnes Flaten, addressed the gathering and emphasised the importance of strengthening collaboration among higher education institutions, noting their vital role in achieving the Sustainable Development Goals (SDGs).

Extension of MoU with HVL

Signing MoU with UIB



The main objective of HRCNET 2.0 is to strengthen existing research collaboration through a PhD programme and to enhance the engagement of private-sector industry partners in both countries in advancing clean energy technologies.

The event concluded with the signing of a tripartite agreement between the UiB, HVL and UoJ.



1.2 Expansion of the research collaborative partnership with Eastern University of Sri Lanka

The NORPART–HRNCET 2.0 project has further expanded its international research network through the signing of a Memorandum of Understanding (MoU) between Eastern University of Sri Lanka (EUSL) and the Western Norway University of Applied Sciences (HVL).

The MoU was ceremonially signed on 23 November 2022 at the Board Room of Eastern University. The event was held under the patronage of Prof. Vallipuram Kanagasingam, Vice Chancellor, EUSL, Prof. Dhayalan Velauthapillai, Head, ANCEHA Research Group and Coordinator, HRNCET 2.0 Project, HVL and Prof. P. Ravirajan, Dean, Faculty of Science and Coordinator, HRNCET 2.0 Project, University of Jaffna



This MoU reinforces the shared commitment to advancing the ambitious and mutually beneficial objectives of the HRNCET 2.0 Project—Research Collaboration on Nanomaterials for Clean Energy Technologies. Her Excellency Trine Joranli Eskedal, Ambassador of the Royal Norwegian Embassy in Colombo, joined the event virtually and delivered a keynote address highlighting the significance of this academic partnership. Speeches were also delivered by Prof. Kanagasingam, Prof. Velauthapillai, and Prof. Ravirajan. A virtual presentation was made by Mr. Keerthivarman Rasamanickam, CEO and Founder of NORAMIX, Norway. Event arrangements were coordinated by Mr. S. Loheeswaran, Dean of the Faculty of Applied Science and Senior Lecturer in Physical Science, Trincomalee Campus. The ceremony was attended by academic staff, faculty members, students, invited guests, and media representatives, marking a notable milestone in international academic cooperation.

Staff training through Doctoral Studies

Mr S. Loheeswaran from EUSL has been pursuing his PhD at the University of Jaffna since January 2025 under the supervision of Prof. P. Ravirajan, Dr P. A. Amalraj, and Prof. Dhayalan Velauthapillai. His doctoral studies contribute significantly to long-term academic capacity building and the institutional development of EUSL.

Mr Loheeswaran will continue his PhD research at the Western Norway University of Applied Sciences and the University of Bergen for a one-year period from January 2026. The MoU continues to foster meaningful collaborations, expand research opportunities, and strengthen educational outreach, benefiting students, staff, and the broader scientific community.



2 International Conference on Adv. Materials for Clean Energy and Health Applications

2.1 AMCEHA - 2023, Coimbatore Institute of Technology, India

The second international conference on Advanced Materials for Clean Energy & Health Applications (AMCEHA 2023) was jointly organized by Coimbatore Institute of Technology (CIT), India, Western Norway University of Applied Sciences (UWL), Norway and University of Jaffna (UoJ), Sri Lanka, and was held at the University of Jaffna on September 19 & 20, 2023. Alagappa University (AU), PSG College of Technology, Norwegian institutions Institute of Energy Technology, University of Bergen, University of Oslo, NORCE and Sri Lankan institutions University of Peradeniya, Eastern University of Sri Lanka and National Institute of Fundamental Studies (NIFS) were also partners in organising the conference.



AMCEHA 2023 had invited abstracts for the following symposia, namely

- Solar energy
- Hydrogen
- Energy storage
- Materials for health applications
- Advanced Functional Materials and Devices.

Over 280 research articles were submitted, and up to 265 research articles have been selected and presented after peer review processes. The experts praised the quality of the presentations and the **conference proceedings edited by Dr. P. Balraju and Dr. M. Thannihachelvan.**

Among the submitted and presented papers, a selected number of quality papers were published in a **'Science Citation Indexed'** journal. AMCEHA 2023 had experts, eminent scientists, industrial representatives, and research students of higher learning in clean energy technologies and Health applications as participants.



Over 400 delegates including four heads of the Higher Education Institutes, Mr. S. Rajiv Rangasami Correspondent of CIT, Dr. Gunnar Yttri, Rector of HVL, Professor S. Srisatkunarahaj, Vice Chancellor of UoJ and Professor Ravi Ganeshan, Vice-chancellor of AU attended the conference. 50 foreign delegates including prominent scientists from Norway, Sri Lanka, Japan, Sweden and Australia were invited to make presentations of their research, and twenty-five academics and research students from Sri Lanka presented their findings. Three MoUs, between CIT and UoJ, HVL and CIT and HVL and Alagappa University were signed by the heads of the HEIs:



AMCEHA 2023 laid a strong platform for the exchange of technical and scientific information between international researchers and will lead to further widen the research network that will result in innovative technical solutions to tackle the environmental and health challenges. (<https://conf.jfn.ac.lk/amceha/>).

2.0 International Conference on Adv. Materials for Clean Energy and Health Applications

2.2 AMCEHA – 2025, University of Jaffna, Sri Lanka



Third International Conference on Advanced Materials for Clean Energy and Health Applications (AMCEHA 2025), jointly organised by the University of Jaffna and the Western Norway University of Applied Sciences (HVL) under the NORPART HRNCET project, was successfully held on 27th and 28th March 2025 at the main premises of the University of Jaffna.

This remarkable event attracted a record number of over 350 participants, including **160** international participants representing more than **36 universities / Higher Education Institutes worldwide.**



The conference was honoured by the presence of distinguished guests, including the Vice-Chairman of the University Grants Commission, Sri Lanka, the Governor of the Northern Province, Sri Lanka, the Consulate General of India in Jaffna, and the Chairman, Ceylon Electricity Board. Additionally, the Vice-Chancellors of the Universities of Jaffna, Alagappa, and Vavuniya, along with Dean Jens Kristian Fosse of Western Norway University of Applied Sciences, graced the inaugural session of the conference. <https://conf.jfn.ac.lk/amceha/>



2.2.1 Organising committee and Symposia

<p>General Chairs Prof. S. Srisatkunarajah, <i>Vice Chancellor, UoJ</i> Prof. Gunnar Yttri, <i>Rector, HVL, Norway.</i></p> <p>Conference Chairs Prof. P. Ravirajan, UoJ Prof. Dhayalan Velauthapillai, HVL</p> <p>Conference Secretaries and Editors Prof. M. Thanishaichelvan, UoJ Prof. P. Balraju, CIT</p> <p>Advisory Committee Prof. Siva Sivananthan, Distinguished Professor, UIC and CEO, Sivananthan Laboratories, USA Prof. Saman Seneweera, Chairman/NSF Prof. Ganesan Ravi, Vice-Chancellor, AU Prof. A. Atputharajah, Vice-Chancellor, UoV Prof. V. Kanagasingam, Vice-Chancellor, EUSL</p>	<p>Financial Committee Dr. Ms. U. Sutharshini (Chair) Dr. P. A. Amalraj Ms. D. Rharsigan Mr. M. Nishanth</p> <p>Logistic Committee Dr. T. Pathmathas (Chair) Mr. S. Loheeswaran Mr. K. Balashanger Mr. A. Jerron Ms. S. Piranave</p> <p>Publicity Committee Dr. E. Y. A. Charles (Chair) Mr. T. Rajaramanan Mr. N. Thilleepan</p> <p>Coordinating Committee Prof. Ms. Meena Senthilnathan, UoJ Dr. Ms. Nanthini Nagarajah, HVL Prof. N. Muthukumarasmy, CIT Prof. S. Agilan, CIT Dr. R. Yuvakumar, AU Dr. M. Jeynthinathinath, MKU Prof. Prasanna, PSG Prof. Balasuntharam prapu, PSG</p>
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Abbreviation

- UoP – University of Peradeniya, Sri Lanka
- UoC – University of Colombo, Sri Lanka
- UoV – University of Vavuniya, Sri Lanka
- NIFS – National Institute of Fundamental Studies
- CIT – Coimbatore Institute of Technology, India
- AU – Alagappa University, India
- UoB – University of Bergen, Norway
- MKU – Madurai Kamaraj University, India
- GSU – Georgia State University, US

Symposium on Responsible Research and Innovation: Energy, Environment and Health

- Hybrid Power Systems and Microgrid Operations
- Energy Efficiency
- Energy Management
- Energy Poli

Symposium Chairs

- Prof. A. Atputharajah, UoV
- Prof. Svein Gunnar Sjøtun, HVL

Symposium Editors

- Prof. T. Thiruvaran, UoJ
- Dr. Nanthini Nagarajah, HVL

Symposium on Solar Energy

- Dye /Quantum dot-sensitized Solar Cells
- Organic Solar Cells
- Perovskite Solar Cells
- Novel Materials for Solar Cells
- Solar Thermal Application
- Thin film Solar Cells

Symposium Chairs

Prof. N. Muthukumarasamy, CIT

Symposium Editors

Prof. MAKL Dissanayake, NIFS
Dr. P. A. Amalraj, UoJ
Dr. R. Balasundaraprabhu, PSG

Symposium on Hydrogen Energy

- Fuel Cell
- Hydrogen Production
- Hydrogen Storage & Transport
- Hydrogen Safety
- Biomass

Symposium Editors

Dr. B. Ketheesan, UoJ
Dr. R. Yuvakkumar, AU

Symposium Chairs

Prof. Velaug Myrseth Olteidal, HVL
Prof. Meena Senthilnathanan, UoJ

Symposium on Advanced Functional Materials & Devices

- Batteries
- Carbon Capture
- Dye Degradation
- Energy from Waste
- FETs
- LEDs
- Photocatalysts
- Supercapacitors

Symposium Chairs

Prof. K. Vignarooban, UoJ
Prof. M. Jeyanthinath, MKU

Symposium Editors

Prof. S. Prasanna, PSG Tech
Dr. U. Sutharshini, UoJ

Symposium on Nanomaterials for Health Applications

- Biomaterials
- Biosensors/Detectors
- Environmental and Health impacts of Clean Energy Technologies
- Materials for Drug Delivery
- Nanomaterials for Health Care
- Regenerative Medicine
- Tissue Engineering

Symposium Editors

Dr. T. Pathmathas, UoJ
Dr. B. Gayathiri, CIT

Symposium Chairs

Prof. S. Agilan, CIT
Dr. R. Azarudeen, CIT

Symposium on Modelling, Simulation & AI for Clean Energy and Health Applications

- Smart materials for Clean Energy Applications
- Smart Materials for Health Applications
- AI for Clean Energy Management
- AI for Energy Storage Systems Control

Symposium Editors

Dr. A. Kaneswaran, UoJ
Dr. A. Thevakaran, UoJ

Symposium Chairs

Prof. Reza Arghandeh, HVL
Prof. Lilantha Samaranyake, UoP

2.2 .2 Keynote/Plenary Speakers - AMCEHA 2025

AMCEHA 2025 provided an exceptional platform for researchers to showcase their findings before a distinguished gathering of eminent scientists. The event also fostered the establishment of numerous collaborative links among researchers from over thirty higher education institutions.



Prof. Kirithi Tennakone
Georgia State University,
USA



Dr. Theva Thevuthasan
Pacific Northwest National
Laboratory (PNNL), USA



Dr. Shuththa Vaithiyalingam
Pacific Northwest National Lab,
USA



Prof. Lakshman Dissanayake, NIFS,
Sri Lanka



Prof. Gamini Rajapakse
University of Peradeniya,
Sri Lanka



Prof. G. R. A. Kumara
NIFS, Sri Lanka



Prof. S. Balakumar
University of Madras, India



A/Prof. Velaug Myrseth
Uitedal, HVL, Norway



A/Prof. Jonathan Økland
Torstensen, HVL, Norway



Prof. Jens Kristian Fosse
HVL, Norway



A/Prof. Nora Geirsdotter
Bækkelund, HVL
/Norway



A/Prof. Svein Gunnar Sjetun,
HVL/Norway



Prof. Martin Greve
Univ of Bergen, Norway

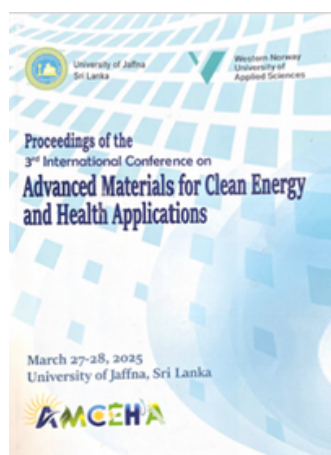


Dr. M. Jeyanthinath
Madurai Kamaraj
University, India

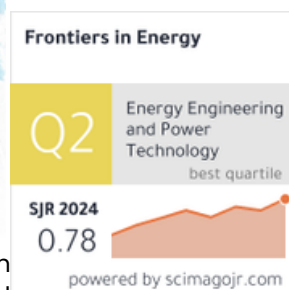


Dr. R. Vidya
Anna University, India

2.3 Proceedings of the Abstracts and full papers in SCI Journal



“International Conference on Advanced Materials for Clean Energy Applications” 2025 (AMCEHA-2025) appeared in Frontiers in Energy and Zeitschrift für Physikalische Chemie (International journal of research in physical chemistry and chemical physics)



A total of 310 research articles were submitted, of which 220 high-quality papers were selected and presented after rigorous peer review.

Conference Editors

Prof. M. Thanishaichelvan, UoJ
Prof. P. Balraju, CIT

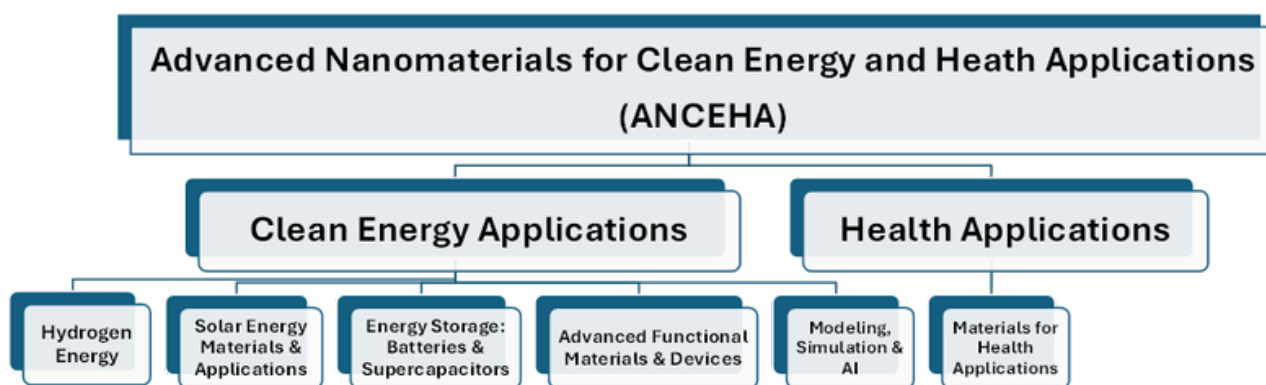
Impact Factor: **6.2**,
SJR: **0.78 (Q2)**

Impact Factor: **3.1**,
SJR: **0.39 (Q3)**

3.0 International Students' Mobility programme

3.1 Access to high-end equipment

The research group ANCEHA created by Western Norway University of Applied Sciences, University of Jaffna and Coimbatore Institute of Technology and led by Prof. Dhayalan Velauthapillai consists of activities related to a variety of fields related to nanomaterials for clean energy and health applications. Both experimental and theoretical research are carried out on nanomaterials for emerging solar cell technologies, green hydrogen (photo-catalytic, photo-electrochemical, electrochemical), energy storage and transistor technologies as depicted in the figure below. The research group is also involved in analyzing and optimizing the floating PV plant. In addition, a number of studies are carried out on energy transition, energy management and energy policies under these projects. A new research group on simulation of materials for clean energy applications has been established at UoJ



PhD students: Rajaramanan Tharmakularasa (UoJ, UiB &HVL: 2018 & 2021-2022 &2025-present), Chapa Pamodani Wanniarachchi (UoJ&HVL: 2021-2022 & 2024-present) & Sivagowri Shanmugaratnam (UoJ, UiB &HVL: 2019, 2020-2022 & 2023-2025)



Master and PhD students: Kobika Venugopalavanithasan (UiB &HVL: 2023-2025), Buddhika Karunarathne (HVL : 2023-present), Asiri Dhanushka Thimal Medagedara (UiB&HVL: 2024-present), Kajani Mayaheswaran (UiB&HVL: 2024-present).



Student mobility: Abiram Gnanasampanthan (UoJ: 2022), Thuraisamykurukkal Thivakarasarma (UoJ: 2022) and Velu Aeneas Jerron (UoJ: 2022) having their research stay at HVL

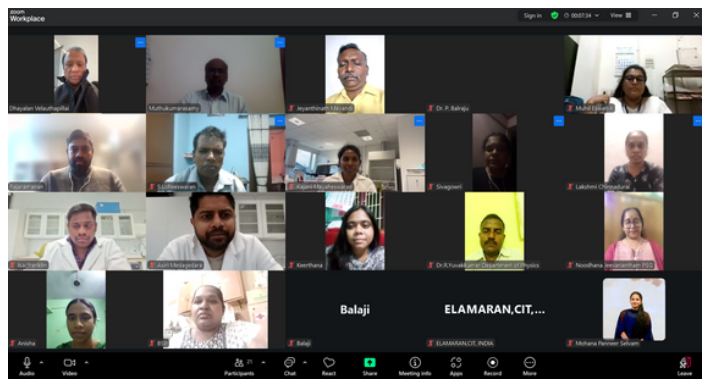


Master students: Lavanya Nagulanathan (UiB &HVL: 2022-2024), Vithursha Lingeretnam (UiB&HVL: 2024-present).

These exchange programmes facilitated exposure to different learning techniques, academic knowledge exchange and research facilities through seminars, workshops, short courses, research days, discussions and demonstrations with various research scholars, academics, and industrialists. This has especially helped the exchange students to continue their research activities with not only international exposure and experience on the variations in the practice of research methodology but also to have different cultural experiences. These students have been able to demonstrate their research to different external collaborators of the research group attached to the academic and industrial network in Norway during their visits to the research laboratories. These visits have helped to expand the network of the research group, and also provided opportunities for the students to get recognition for their research activities and experiments.

Weekly research group meeting

Up to fifty research students and their supervisors from the collaborating partners in Norway, Sri Lanka, and India have been conducting weekly presentations of their research work, followed by extensive discussions aimed at improving the quality of their work and exploring potential collaborations. They have also been actively involved in the periodic organisation of conferences, as well as in coordinating student and staff mobilities.



3.0 International Students' Mobility programme

3.2 Sri Lankan Research scholars: Defended their PhD Theses at HVL

Nanthini Nagarajah, from Jaffna, has successfully defended her doctoral thesis titled **“Sustainable Transition in a Developing Country Context: Drivers and Barriers for Renewable Energy Technologies in Sri Lanka”** at HVL, Norway. Her research explores the key factors influencing the adoption of renewable energy technologies in Sri Lanka under **CBERC project**.



MeeNilankco Theiventhran, from Colombo, has successfully defended his doctoral thesis titled **“Energy Transition in Post-War Sri Lanka: Policy Pathways, Geopolitical Dynamics and the Question of Equity”** at the University of Oslo. His research questions the notion that all “clean” and “green” technologies are inherently desirable under **CBERC project**.



3.3 Completion of a PhD degree under joint supervision







One of the three PhD candidates working in different fields, Ms S. Sivagowri, has successfully defended her PhD thesis titled **“Green Hydrogen Production through Photocatalytic Water Splitting”** before an eminent panel of scientists at the University of Bergen, under joint supervision by Professor Dhayalan Velauthapillai (Western Norway University of Applied Sciences, Norway), Professor Øyvind Frette (University of Bergen, Norway), Dr (Mrs) S. Yohi (University of Jaffna), and Professor P. Ravirajan (University of Jaffna). Her achievement is further distinguished by the publication of more than eight papers in high-impact journals (see: <https://scholar.google.com/citations?hl=en&user=RehqW9gAAAAJ>) during her MPhil and PhD programmes under the first and second phases of the HRCET project.

This accomplishment will undoubtedly inspire and accelerate the progress of three more PhD students from University of Jaffna, who are pursuing research in different fields under joint supervision involving academics from the University of Jaffna and the Western Norway University of Applied Sciences, towards the successful completion of their PhD programmes with a high standard of academic excellence. It's noteworthy that Miss Sivagowri Shanmugaratnam had obtained both her MPhil and PhD degrees under the Norpart project between Western Norway University of Applied Sciences and Univ of Jaffna funded by the Norwegian Directorate for Higher Education and Skills (HK-Dir).



Master's and PhD students from Sri Lanka and India, Professor Dhayalan, and PhD examiners at the University of Bergen

Summary of PhD Students under joint supervision

Name of the PhD student	Field of specialisation	Supervisors	No. of papers published in SCIs*	PhD Awarding university
T. Rajaramanan 	Dye Sensitised Solar cells	Prof. D.Velauthapillai, HVL Prof. Øyvind, UiB Prof. M.Senthilnathanan, UoJ Prof. P.Ravirajan, UoJ	9	UoB
S. Sivagowri 	Hydrogen Energy	Prof. D.Velauthapillai, HVL Prof. Øyvind, UiB Dr. (Mrs.) S.Yohi, UoJ Prof. P.Ravirajan, UoJ	8	UoB
C. Wanniarachchi 	Simulation	Prof. D.Velauthapillai, HVL Dr. A. Thevakaran, UoJ Prof. P. Ravirajan, UoJ	5	UoB
B. Karunaratne 	Hydrogen Energy	Prof. D.Velauthapillai, HVL Prof. Øyvind, UiB Prof. G. K. R. Kumara	8	UoB
S. Loheeswaran 	Perovskite Solar cells	Prof. P.Ravirajan, UoJ Dr. Amalraj Peter Amalathas, UoJ Prof. D. Velauthapillai, HVL	4	UoJ
S. Kriushanthy 	CNT FETs	Prof. M. Thanishaichelvan, UoJ Prof. U. Sutharshini, UoJ	Commenced in November 2025	UoJ

*No. of papers published in SCIs during the MPhil period as well.

PhD/MPhil students, who completed their studies under first phase of HRNCET



Mr. S. Uthayaraj
No. of SCI papers : 2



Mr. Asitha Udayanga
No. of SCI papers : 3



Mr. T. Rajaramanan
No. of SCI papers : 3



Mr. A. Pirashanthan
No. of SCI papers : 8



Ms. T. Kajana
No. of SCI papers : 4



Ms. S. Sivagowri
No. of SCI papers : 5



Ms. W. C. P. Wanniarachchi
No. of SCI papers : 3



Mr. G. Abiram
No. of SCI papers : 2

3.3 Sri Lankan students pursuing Full-Degree Master program (two years) in Norway

The following Sri Lankan students got opportunities to pursue two year master degree programme at HVL and University of Bergen under the HRNCET 2.0 project. Two students, Ms. N. Lavanya and Ms. L. Virthusa have successfully completed two year master degree by receiving full scholar under the project.



Ms. N. Lavanya



Ms. L. Vithursha



Ms. V. Kobika



Mr. B. Karunarathne



Mr. A.D.T. Medagedara



Ms. M. Kajani



Ms. S. Savithiri



Mr. G. Abiram



Mr. P. M. B. Hendeniya

PG students	Master / PhD	Commenced in	Research Area
Asiri Dhanushka Thimal Medagedara	Master	Aug 2024	Energy storage and perovskite solar cells
Buddhika Karunarathne	Master	Aug 2024	Perovskite solar cells
Kajani Mayaheswaran	Master	Aug 2024	Photocatalytic hydrogen production
Kobika Venugopalavanithasan	Master	Aug 2023	Rare – Earth Tungstates as efficient electrocatalysts for hydrogen evolution reaction in alkaline water electrolysis
Pasindu Madubashana Bandara Hendeniya	Master	Aug 2024	Machine Learning–Based Optimization of Hybrid Solar–Energy Storage Systems
Savithiri Sivathanan	Master	Aug 2024	Photocatalytic Hydrogen Production from water splitting – Toward sustainable fuel generation
Abiram Gnanasampanthan	Master	Aug 2024	Fabrication and Electrochemical evaluation of Metal Oxide Electrode Materials for High-Performance Supercapacitors
Lavanya Nagulanathan	Master	Aug 2022	Electrode materials for hydrogen evolution reaction
Vithursha Lingeretnam	Master	Aug 2022	Perovskite solar cells: Materials, Fabrication and Characterization

Ongoing MPhil Studies under the project

The following male M.Phil. students have completed more than one year of research attachment at the Western Norway University of Applied Sciences and the University of Bergen, where they accessed advanced, state-of-the-art equipment not available in Sri Lanka for complementary data collection. They are now nearing completion of their M.Phil. degrees. In contrast, the female students have only recently begun their research work under the HRNCET 2.0 project, and they will also undertake approximately one year of research training at the aforementioned universities in 2026 as part of the project.



Mr. T. Thivakarasarma



Mr. V. Aeneas Jerron



Ms. S. Piranave



Ms. Harini

Master of Science in Clean Energy Technologies

Of the nine students who qualified for the taught Master of Clean Energy Technologies, four opted to upgrade their registration to the two-year Master of Science in Clean Energy Technologies. These students have now completed the required coursework and submitted their dissertations for consideration for the award of the M.Sc. degree.

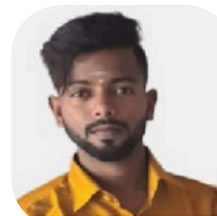
The curricula for both the taught Master’s and the M.Sc. programmes were originally developed under the HRNCET 1.0 project and are scheduled to be comprehensively revised and strengthened under the HRNCET 2.0 project. This ongoing enhancement aims to align the programmes with emerging trends, industry needs, and global standards in clean energy education.



Ms. Sivarathika



Ms. Thievanithy



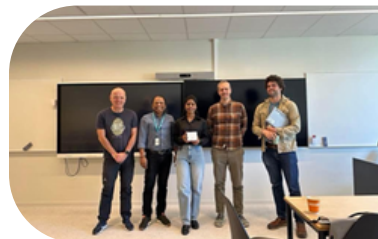
Mr. Sumanthiran



Ms. Layanthini

Sri Lankan Research students: Completed Master degree Theses at HVL & UiB

Vithursha Lingaretnam and Lavanya Nagulanantham, the first cohort of NORPART-funded full-degree Master’s students, successfully completed their degrees at HVL/UiB in July 2024, marking a significant milestone in the partnership between the institutions.



Kobika Venugopalavanithasan began her research on hydrogen production through alkaline water electrolysis. Her work focuses on developing and studying nanomaterials that can act as efficient catalysts for this process at the University of Bergen (UiB) and the Western Norway University of Applied Sciences (HVL). She completed her master’s degree in physics from UiB by successfully defending her thesis in October 2025.

4.0 New initiative on Hydrogen Energy Research in line with National Energy Policy

Collaborators from Norway, India, and Sri Lanka have engaged in extensive virtual and in-person discussions to further strengthen ongoing research activities, particularly in the area of hydrogen research, with the aim of preparing joint proposals for European funding. Teams from Norway and India visited the University of Vavuniya and the National Science Foundation, where they held meetings with representatives from the Universities of Jaffna, Vavuniya, Ruhuna, and Peradeniya. This initiative aligns closely with the national hydrogen policy and supports Sri Lanka’s emerging research priorities in this strategic field.



Seminar at Faculty of Engineering with industry on Hydrogen and solar cell technologies April 2022.



Clean Energy seminar in Colombo under the project- April 2022



Meeting with the Norwegian Ambassador - April 2022



Agreement signing at Univ of Peradheniya, April 2022



Seminar at UoJ and NSF march 2024 Erasmus+



Meeting at NSF, Colombo with representatives from Universities of Moratuwa, Ruhuna and Peradeniya Universities



Partnership with industry - VolfPack energy Limited, Sri Lanka



Collaborators at University of Vavuniya October 2025



Meeting at the University of Vavuniya October 2024



Norwegian delegation visit to Wind energy farm in Mannar April 2022

5.0 Outreach Activities

5.1 Competition – Clean energy technologies based on innovative prototype model development



The Center for Science Education, Faculty of Science, University of Jaffna, organized a competition on clean energy technologies based innovative prototype model development funded by the Royal Norwegian Embassy in Colombo. The first phase of evaluation was held continuously for three days through Zoom, and the final competition and awarding ceremony were conducted today at the Mini Auditorium, Department of Physics, University of Jaffna.



Vice-Chancellor, UoJ; Prof. Dhayalan Velauthapillai (Coordinator, CBERC Project; HVL); Prof. P. Ravirajan (Dean/Science and Coordinator/CBERC Project); Prof. S. N. Surenthiran (Director/CSE), and Mr. S. Anurakavan from UBL participated as special guests.

5.0 Outreach Activities

5.2 Promoting STEM education in Northern Province - Conducted by students' societies

To commemorate **50 years of excellence in science education and research by the Faculty of Science**, all student societies within the faculty were invited to submit brief proposals aimed at promoting STEM education in the underprivileged areas of the Northern Province in Northern Province. These initiatives benefited more than **800 students** under **the HRCNET 2.0 project**. The student societies remain highly motivated and continue to play an active role in organising and delivering these impactful programmes.



Societies	Name of the activities	Target group	No. of beneficiaries
Biological Society	Biology Education Programme	Grade 7 students from type II schools in Thenmarachchi Zone	140
Computer Society	National-level Coding Competition	Undergraduates in computing	75
Fisheries Science Society	Awareness of Marine Plastic Pollution	Grades 9 to 11 who are studying in difficult areas	40
Zoological Students'	Scientific innovation competition	Grade 10 and 11 students of Northern Province	75
Chemical Society	Chemistry Practical Sessions	Grade 11 students in selected two remote area schools in the Island	100
Physics Society	School Backyard Physics Lab	Grades 10 & 11 students from Mullaitivu and Mannar (under privilege area)	300
Mathematical Society	Teaching Geometry	Grade 10 school students from the privileged area of Valikamam	100

Teaching and hands-on practical sessions on Biology Education

Grade 7 students from underprivileged areas in the Thenmarachchi Zone. The **Biology Society** of the Department of Botany, with the active involvement of honours degree students, successfully organised a Biology Education Programme for students from 17 Type II schools in the Thenmaradchi Zone. Many of these schools are underprivileged, and the programme was conducted under the guidance of the academic and technical staff. The programme featured teaching sessions, hands-on practical activities—including microscopes—and a quiz competition. Remarkably, a school without science teachers won first place in the quiz competition, highlighting the enthusiasm and dedication of the participating students. It is particularly encouraging to note that the programme inspired the students and motivated the teachers who accompanied them.



5.0 Outreach Activities

5.2 Promoting STEM education in Northern Province – Conducted by students’ societies

Science Practical Sessions for GCE(O/L) Students – in the Islands Zone

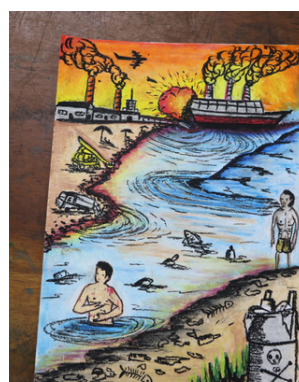
Organised by the **Chemical Society** on 08.02.2025 at Velanai Central College under the HRNCET Project, this programme aimed to enhance students’ laboratory skills, reinforce scientific concepts and develop problem-solving abilities through interactive sessions. It fostered curiosity and critical thinking, inspiring students to pursue further education and careers in science. Through hands-on practical sessions and comprehensive explanations, students gained a deeper understanding of the scientific principles underlying the experiments in their syllabus. Engaging in these activities allowed them to bridge theoretical knowledge with real-world applications, making the learning experience more effective and meaningful.



Quiz, Art and Poster Competition on Management of Marine Resources

To celebrate 50 years of excellence in science education by the Faculty of Science, the **Fisheries Science Society** (FSS) of the Department of Fisheries organised a series of engaging competitions to highlight the significance of ocean and fisheries science under the HRNCET project

The programme brought together students from coastal schools in the Jaffna educational zone who study Aquatic Resource Management, providing them a platform to showcase their knowledge and creativity. The programme, guided by dedicated academic staff and supported by the non-academic team, included art, quiz, and poster competitions. The event concluded successfully, showcasing the remarkable talent and enthusiasm of the participants. In recognition of their efforts, winners and participants were honoured with prizes and certificates, celebrating their achievements and inspiring a deeper passion for marine and fisheries sciences.



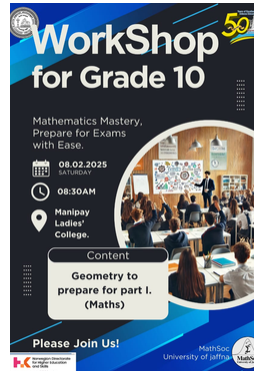
5.0 Outreach Activities

5.2 Promoting STEM education in Northern Province – Conducted by students’ societies

Workshop on Learning Geometry

To commemorate 50 years of dedicated service by the Faculty of Science in advancing science education, the **Mathematical Society (MathSoc)** organised a Learning Geometry workshop for Grade 10 students at Manipay Ladies’ College under the HRCNET project.

Furthermore, the workshop strengthened students’ problem-solving abilities by fostering logical reasoning and strategic thinking, enabling them to approach geometry problems with greater efficiency and accuracy. By bridging theory and practice, students were encouraged to connect geometric concepts with real-world applications through hands-on activities and practical examples. Ultimately, the initiative aimed to enhance their exam performance by equipping them with effective problem-solving strategies, particularly in topics related to triangles and circles.



School Backyard Physics Lab

The Physics Society (PHYSOC) of the Department of **Physics and the IEEE Electron Devices Societies (EDS)** Student Chapter, University of Jaffna, jointly conducted an impactful outreach programme titled “School Backyard Physics Lab” under the HRCNET project. The event was held in the Madu Zonal Education Division in Mannar District, reaching 220 students from 7 underprivileged schools. This programme aimed to strengthen students’ understanding of Grade 10 and O/L physics concepts through interactive teaching sessions and hands-on practical activities using science kits. The theoretical sessions simplified complex topics using real-life analogies, making physics more relatable and enjoyable. Simultaneously, the practical component encouraged students to experiment, innovate, and apply what they learned, fostering enthusiasm toward science. This initiative not only improved conceptual clarity but also inspired students to pursue further studies in the Advanced Level physical science stream.



5.0 Outreach Activities

5.2 Promoting STEM education in Northern Province – Conducted by students’ societies

Innovation Competition for School Students in the Northern Province

This initiative, planned by the **Zoological Students Association** to nurture creativity and encourage scientific thinking among school students throughout the Northern Province. The event, titled “Kinetic Minds 2025”, was envisioned as a province-wide competition under the theme “Utilisation of Waste Materials for Sustainable Energy.” The competition invited innovative project proposals from school teams, with the original plan to select 15 teams for participation. A public announcement was prepared and disseminated widely through the support of the Provincial Director of Education. With assistance from the Department of Education, the call for applications reached all schools across the province. In response, a substantial number of proposals were received by the deadline. These submissions were meticulously reviewed and evaluated by academic staff from the Department of Zoology, Faculty of Science, University of Jaffna.

Based on the quality of the proposals and the constraints of the available budget, 13 teams were selected to take part in the competition. The competition provided a dynamic platform for students to showcase innovative ideas, demonstrating how waste materials could be creatively repurposed or converted into sustainable energy solutions.



UoJ Coders v3.0: A National 12-Hour Inter-University Coding Competition

The Computer Society (CompSoc) of the University of Jaffna organized the coding competition for the third time ('UoJ Coders v3.0') in collaboration with the Department of Computer Science. 'UoJ Coders v3.0' is a 12-hour inter-university competition aimed at enhancing the problem-solving and programming skills of undergraduate computing students. A total of 129 teams registered for 'UoJ Coders v3.0,' with participants from 14 state universities and six other institutions.

The Vice-Chancellor of the University of Jaffna and the Dean of the Faculty of Science attended the inaugural session and delivered their speeches. For the first time in Sri Lanka, 'UoJ Coders v3.0' was conducted using the VPL Jail server, with technical support from the Lanka Education and Research Network (LEARN) team. Based on the final scores, 'Team Glory' from SLIIT secured first place. The success of UoJ Coders v3.0 would not have been possible without the generous support of sponsors Oyslans, Thambaiyah Fashion, SenzMate AIoT Intelligence, Unicom SD, and the Norwegian Directorate for Higher Education and Skills. The competition was coordinated by Dr. T. Kokul, Senior Treasurer, and Dr. (Mrs.) B. Mayurathan, Patron of the society, with the support of all academic staff members



5.2 Exhibition on Green Energy Technologies & Practical Seminar for G.C.E. (A/L) Students

The Department of Physical Science, Faculty of Applied Science, Trincomalee Campus, successfully organised the “Green Energy Technologies Exhibition 2024” on 21 and 22 March 2024. The programme also included a hands-on seminar in Physics and Electronics for G.C.E. (A/L) students.

Supported by the NORPART–HRNCET 2.0 project (HVL), the two-day event attracted over 700 G.C.E. (A/L) students and 130 students from the College of Education, highlighting a strong and growing interest in clean energy technologies.

The Department extends its sincere appreciation to all who contributed to the success of this impactful outreach initiative.



5.3 Community Outreach & Educational Support for G.C.E. (A/L) Science Students

A seminar and workshop titled “Preparation Sessions for GCE A/L Science Students – 2022” was held on 29 December 2022, benefiting 250 A/L Science students from the Batticaloa Zone. This programme was financially supported by the NORPART–HRNCET 2.0 Project and jointly organised by: Centre for Science Education (CSE), Faculty of Science, University of Jaffna, Jaffna Science Association and Eastern University, Sri Lanka

Sessions were conducted at BT/Mahajana College and BT/Vincent Girls' High School (Biology stream), offering valuable academic guidance and preparatory support to students sitting the G.C.E. (A/L) examinations. Resource persons from the Faculty of Science, University of Jaffna served as resource persons of the programme by visiting the premisses all the way from Jaffna.



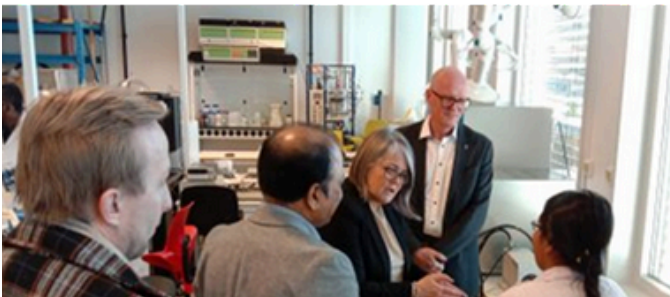
5.0 Outreach Activities

5.4 Showcasing Innovation in Renewable Energy Technologies

Sri Lankan and Indian postgraduate students presented prototype models highlighting advances in renewable energy technologies, including next-generation solar cells and hydrogen production materials. Their presentations were highly appreciated by faculty members and visiting dignitaries for their scientific depth and practical relevance.

Highlights:

- Live demonstrations of supercapacitors and CO₂ adsorption systems.
- Collaborative research conducted at HVL's Clean Energy Laboratory.



Ambassador of India to Norway, Dr. Bala Bhaskar, visited the Clean Energy Laboratory and engaged with students elaborating on their research outcomes.



Former Prime Minister of Norway and current Member of Parliament, Erna Solberg, at our Clean Energy Lab and research group (ANCEHA) at the Western Norway University of Applied Sciences (HVL), together with our Rector, Gunnar Yttri.

5.0 Outreach Activities

5.4 Showcasing Innovation in Renewable Energy Technologies



On September 5, 2025, Professor Øyvind Frette, Vice Dean for Research and Innovation at the University of Bergen, and Associate Professor Arne Skodvin Kristoffersen from the Department of Physics and Technology at the University of Bergen, visited to the ANCEHA research lab.

5.5 Academic Engagements and Conference presentations



Sivagowri Shanmugaratnam (PhD student) and Lavanya Nagulanantham (Master’s student) and Rajaramanan Tharmakularasa (PhD student) represented the programme at HyValue Days and several other international conferences (TNNN conference 2023 and 2024), showcasing their research achievements and fostering academic collaborations.

5.5 Academic Engagements and Conference presentations



International Climate conference in Bergen March 2023

5.6 Public Outreach and Research Days

Professor Dhayalan Velauthapillai from HVL took an active role on Research Days - Norway’s national festival celebrating research and innovation. At HVL’s Hydrogen Station in Bergen, visitors of all ages had the opportunity to explore hydrogen as a sustainable energy source through interactive exhibits and demonstrations.

During the Young Research Days event, Professor Dhayalan Velauthapillai delivered an inspiring talk titled “The Next Generation of Solar Cells”, highlighting breakthroughs in renewable energy research.

In addition, students from Kongshavn High School, Oslo, visited the ANCEHA Research Laboratory, where they gained first-hand experience of university-level research and engaged with scientists working on cutting-edge clean energy technologies.



The Zolw Conference 2025 on 4 November 2025 at Clarion Hotel Oslo Airport!

The opportunity to showcase our solar cell prototypes and learn about the latest solar cell technologies and how they are being adapted for Nordic climate conditions.



The event brought together leading companies in the Norwegian solar sector, including Solcellespesialisten, Otovo, Fusen World, and many others.

6.0 Project Outputs and Impacts

6.1 Publications

Research students working under the above projects have produced more than 100 publications, including **42 articles in high-impact-factor SCI journals** and over 60 abstracts presented at international conferences to date, <https://project.jfn.ac.lk/hrncet/index.php/publications/>.

6.1.1 Science Citation Index Journal articles published in the year 2022 – 2025

- NANO 2022: Thuraisamykurukkal Thivakarasarma, Adikari Arachchige Isuru Lakmal, Buddhika Senarath Dassanayake, Dhayalan Velauthapillai, Punniamoorthy Ravirajan. (2022) 'Thermally Evaporated Copper Iodide Hole-Transporter for Stable CdS/CdTe Thin-Film Solar Cells' *Nanomaterials MDPI*, 12 (July), pp: 2507, doi.org/10.3390/nano12142507. Scopus, SCI expanded, **Impact Factor: 4.3**.
- NANO 2022: Gnanasampanthan Abiram, Murugathas Thanihachelvan, Punniamoorthy Ravirajan, Dhayalan Velauthapillai. (2022) 'Review on perovskite semiconductor field-effect transistors and their applications' *Nanomaterials MDPI*, 12 (July), pp: 2396, doi.org/10.3390/nano12142396. Scopus, SCI expanded, **Impact Factor: 4.3**.
- ACO 2023: Sivagowri Shanmugaratnam, Punniamoorthy Ravirajan, Shivatharsiny Yohi, Dhayalan Velauthapillai. (2023) 'Well-Separated Photoinduced Charge Carriers on Hydrogen Production Using NiS₂/TiO₂ Nanocomposites'. *ACS omega*, 9(December), pp: 1627-1633, doi: 10.1021/acsomega.3c08194. Scopus, SCI expanded, **Impact Factor: 4.3**.
- ACO 2023: WA Chapa Pamodani Wanniarachchi, Thevakaran Arunasalam, Punniamoorthy Ravirajan, Dhayalan Velauthapillai, Ponniah Vajeeston. (2023) 'Hybrid Functional Study on Electronic and Optical Properties of the Dopants in Anatase TiO₂'. *ACS omega*, 8(October), pp: 42275-42289, doi: 10.1021/acsomega.3c04329. Scopus, SCI expanded, **Impact Factor: 4.3**.
- SCR 2023: Tharmakularasa Rajaramanan, Fatemeh Heidari Gourji, Yogenthiran Elilan, Shivatharsiny Yohi, Meena Senthilnathanan, Punniamoorthy Ravirajan, Dhayalan Velauthapillai. (2023) 'Natural sensitizer extracted from *Mussaenda erythrophylla* for dye-sensitized solar cell'. *Scientific Reports*, 13 (August), pp: 13844, doi: 10.1038/s41598-023-40437-6. Scopus, SCI expanded, **Impact Factor: 3.9**.
- ACO 2023: Buddhika C Karunaratne, Shashiprabha P Dunuweera, Asiri T Medagedara, Dhayalan Velauthapillai, Ravirajan Punniamoorthy, AG Unil Perera, L Ajith DeSilva, Kirthi Tennakone, Rajapakse Mudiyansele Gamini Rajapakse, Gamaralalage Rajanya Asoka Kumara. (2023) Low-cost perovskite solar cell fabricated using the expanded graphite back contact and electronically conducting activated carbon as the hole transporting material'. *ACS omega*, 8 (June), pp: 23501-23509, doi: 10.1021/acsomega.3c00637. Scopus, SCI expanded, **Impact Factor: 4.3**.
- MIE 2023: Tharmakularasa Rajaramanan, Dhayalan Velauthapillai, Punniamoorthy Ravirajan, Meena Senthilnathanan. (2023), 'A facile impregnation synthesis of Ni-doped TiO₂ nanomaterials for dye-sensitized solar cells'. *Journal of Materials Science: Materials in Electronics*, 34 (April), pp: 916, doi: 10.1007/s10854-023-10347-4. Scopus, SCI expanded, **Impact Factor: 2.8**.
- MTA (2023): Tharmakularasa Rajaramanan, Mansoureh Keykhaei, Fatemeh Heidari Gourji, Punniamoorthy Ravirajan, Meena Senthilnathanan, Øyvind Frette, Dhayalan Velauthapillai. (2023), 'Eco-friendly Egyptian blue (CaCuSi₄O₁₀) dye for luminescent solar concentrator applications'. *Materials Advances*, 4 (April), pp: 4344-4348, doi: 10.1039/D2MA01106A. Scopus, SCI expanded, **Impact Factor: 4.7**.
- IJER 2023: Tharmakularasa Rajaramanan, Fatemeh Heidari Gourji, Dhayalan Velauthapillai, Punniamoorthy Ravirajan, Meena Senthilnathanan. (2023) 'Enhanced Photovoltaic Properties of Dye-Sensitized Solar Cells through Ammonium Hydroxide-Modified (Nitrogen-Doped) Titania Photoanodes'. *International Journal of Energy Research*, 2023 (February), pp: 1090174, doi: 10.1155/2023/1090174. Scopus, SCI expanded, **Impact Factor: 4.2**.
- IJOHE 2024: Sivagowri Shanmugaratnam, Punniamoorthy Ravirajan, Yohi Shivatharsiny, Dhayalan Velauthapillai. (2024) 'Green hydrogen production through photocatalytic seawater splitting on MS₂/TiO₂ (M= Ni/Co/Sn) nanocomposites over simulated solar irradiation'. *International Journal of Hydrogen Energy*, 91(November), pp: 673-682, doi: 10.1016/j.ijhydene.2024.10.091. Scopus, SCI expanded, **Impact Factor: 8.3**.
- MRE 2024: W A Chapa Pamodani Wanniarachchi, Håkon Eidsvåg, Thevakaran Arunasalam, Punniamoorthy Ravirajan, Dhayalan Velauthapillai, Ponniah Vajeeston. (2024), 'Deep insight into structural and optoelectronic properties of mixed anion perovskites'. *Materials Research Express*, 11(October), pp: 025901, doi: 10.1088/2053-1591/ad1f98. Scopus, SCI expanded, **Impact Factor: 2.2**.
- FUEL 2025: Sivagowri Shanmugaratnam, Swathi Srinivasan, Rathinam Yuvakkumar, Velaug Myrseth Oltedal, Punniamoorthi Ravirajan, Yohi Shivatharsiny, Dhayalan Velauthapillai. (2025), 'MS₂/TiO₂ (M= Co, Sn and Ni) electrodes for electrocatalytic and photocatalytic water splitting' *Fuel*, 385 (April), pp: 134101, doi.org/10.1016/j.fuel.2024.134101. Scopus, SCI expanded, **Impact Factor: 7.5**.
- CPI 2025: Piranave Sritharan, Meena Senthilnathanan, Punniamoorthy Ravirajan, Dhayalan Velauthapillai, Gamaralalage Rajanya Asoka Kumara, Balraju Palanisamy. (2025), 'Enhanced solar energy harvest in dye-sensitized solar cells using silver-doped TiO₂ Photoelectrodes via Spray Pyrolysis'. *Chemical Physics Impact*, 11(December), pp: 100910, doi.org/10.1016/j.chphi.2025.100910. Scopus, SCI expanded, **Impact Factor: 4.3**.
- ACO 2025: Tharmakularasa Rajaramanan, Muthugalage Ishara Umayangani Weerasinghe, Gamaralalage Rajanya Asoka Kumara, Meena Senthilnathanan, Punniamoorthy Ravirajan, Dhayalan Velauthapillai. (2025), 'Palmyrah Seed-Derived Activated Charcoal/TiO₂ Composites as a Counter Electrode for Dye-Sensitized Solar Cells'. *ACS Omega*, 10(August), pp: 39415-39425, doi/full/10.1021/acsomega.4c09967. Scopus, SCI expanded, **Impact Factor: 4.3**.

6.1.2 Detail of high impact journals where the research articles are published

Aberr.	Journal Name	Publisher	Country	SJR 2024, Q (Scimago)	Impact factor (2024)
ACO	ACS Omega	ACS Publications	USA	0.710, Q1	4.3
SCR	Scientific Reports	Nature publishing group	UK	0.874, Q1	3.9
MIE	Journal of Materials Science: Materials in Electronics	Springer Science	Netherlands	0.529, Q2	2.8
MTA	Materials Advances	The Royal Society of Chemistry	UK	1.115, Q1	4.7
IJER	International Journal of Energy Research	John Wiley & Sons Ltd.	UK	0.873, Q1	4.2
IJHE	Inter. Journal of Hydrogen Energy	Elsevier	UK	0.873, Q1	8.3
JPS	Journal of Power Sources	Elsevier	Netherlands	2.14, Q1	9.127
JPPA	Journal of Photochemistry and Photobiology A: Chemistry	Elsevier B.V.	Netherlands	0.62, Q1	3.419
CAT	Catalysts	MDPI	Switzerland	0.80, Q2	4.146
MRE	Materials Research Express	IOP Publishing Ltd	UK	0.434, Q2	2.2
JMS	Journal of Material Science: Material in Electron.	Springer Nature	USA	0.48, Q2	2.22
MSSP	Materials Science in Semiconductor Processing	Elsevier	UK	0.70, Q1	3.927
SOL	Solar energy	Elsevier	UK	1.34, Q1	5.742
FUEL	Fuel	Elsevier	UK	1.614, Q1	7.5

4th International Conference on
Advanced Materials for Clean Energy and Health Applications
June 3-5, 2026, Coimbatore Institute of Technology, India

Collaborating Partners

Submission of papers

The inaugural issue of the Clean Energy Newsletter, developed under the NORPAT-HRNCET Project, was released online on 27 October 2022. Intended as a platform to highlight both the potential and challenges of clean energy technologies regionally and nationally, the newsletter is published every trimester. The next issue is scheduled for release in February 2026. The editors are Prof. M. Thanichelvan and Dr P. Balraju (CIT, India).



6.0 Project Outputs and Impacts

6.2 Energy Generation and Research Insights from the First-ever Floating Solar Plant

≡ **pv magazine**

Novel floating PV system design from Norway

Norwegian scientists have tested a new floating PV system concept at a water reservoir in Sri Lanka. The system is made of composite beams to support the solar panels and high-density polyethylene (HDPE) pipes to provide buoyancy.

JUNE 24, 2022 **EMILIANO BELLINI**

Impact on National Energy Policy

Sri Lanka's first floating PV installation gained national and international attention, prompting policymakers of the country to recognise floating solar as a key technology for achieving national RE targets. It is now included in the **CEB's Long-Term Generation Expansion Plan** as a viable option for future capacity development. Building on this momentum, SLSEA has approved pilot projects, the CEB has issued EOIs for large-scale plants, and studies highlight significant potential across major reservoirs

Norwegian master students Research stay at the Floating Solar Plant, UoJ

Research work related to the floating solar plant is being undertaken jointly by research students and staff from the Western Norway University of Applied Sciences and the University of Jaffna. Testing and planning activities are in progress to assess the viability of power generation from the floating solar system during the current energy crisis. Further analyses are also being conducted to enhance floating solar technologies with a view to scaling up power generation for large-scale applications.

The installed floating solar plant, comprising 157 solar panels (295 Wp and 315 Wp), a 50 kW SMA inverter, data logger, sensors, and a ground-mounted PV system, has the following key features:

1. It generates approximately **4–5%** more power than the land-based system.
2. The average monthly energy generation is around **5,000 kWh (units)**.
3. Connected to the grid via a net-metering scheme under the CEB general-purpose tariff, the pilot floating system **saves** the university about **1 million rupees annually in electricity costs**.
4. It serves as a **model for nationwide replication** in water reservoirs across the country.



Edited & Designed by



Prof. P. Ravirajan



Dr. S. Sivagowri

Sponsor



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