

RGC Ref. No.: <u>UGC/IDS(R)24/20</u> (please insert ref. above)

**RESEARCH GRANTS COUNCIL
COMPETITIVE RESEARCH FUNDING SCHEMES FOR
THE LOCAL SELF-FINANCING DEGREE SECTOR**

**INSTITUTIONAL DEVELOPMENT SCHEME (IDS)
RESEARCH INFRASTRUCTURE GRANT**

Completion Report

(for completed projects only)

<p><u>Submission Deadlines:</u></p> <ol style="list-style-type: none"> 1. Auditor's report with unspent balance, if any: within six months of the approved project completion date. 2. Completion report: within 12 months of the approved project completion date.
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Important Note:

In completing the report, please use the following format:

Page limit: Items 1 to 5 and Summary of Completion Report: no page limit
Items 6 to 9: maximum **20 A4 pages** (excluding any appendices and attachments)

Font: Times New Roman

Font Size: **Not smaller** than Point 12

Margin: Two centimeters margin all around

Spacing: Single-line spacing

1. Project Title

Establish the Research Centre for Green Energy, Transport and Building in PolyU SPEED

(在香港理工大學之專業進修學院創建“綠色能源、交通運輸及建築” 科研中心)

2. Investigator(s) and Academic Department(s) / Unit(s) Involved[#]

Project Team	Name / Post	Department / Unit	Average Number of Hours Per Week Spent on this Project
Project Holder ¹ (i.e. Head of Institution)	Prof LEUNG Chun-wah / Associate Dean(Research) and Professor ²	Director's Office / PolyU SPEED	8

Project Team	Name / Post	Department / Unit	Average Number of Hours Per Week Spent on this Project
Team Leader	Prof LEUNG Chun-wah / Associate Dean(Research) and Professor	Director's Office / PolyU SPEED	8
Team Member (1)	Dr LOH Anthony Wai-keung / Division Head	Division of Science, Engineering and Health Studies (SEHS) / PolyU SPEED	8
Team Member (2)	Dr NG Artie Wai-cheong / Dean (<i>Departed - Family immigration to Canada</i>)	International Business University, Canada	1
Team Member (3)	Dr ZHANG Flora Hao ³ / Former Lecturer (<i>Departed - Family immigration to Canada</i>)	(Former Affiliation) Division of Science, Engineering and Health Studies (SEHS) / PolyU SPEED	6
Team Member (4)	Dr LAM Antony King-cheong / Lecturer	Division of Science, Engineering and Health Studies (SEHS) / PolyU SPEED	6
Team Member (5)	Dr LAM Edmond Wai-ming / Senior Lecturer	Division of Science, Engineering and Health Studies (SEHS) / PolyU SPEED	6

Project Team	Name / Post	Department / Unit	Average Number of Hours Per Week Spent on this Project
Team Member (6)	Dr LIANG Junot Shanjun / Lecturer	Division of Science, Engineering and Health Studies (SEHS) / PolyU SPEED	6
Team Member (7)	Dr WU Andrew Yang / Lecturer	Division of Science, Engineering and Health Studies (SEHS) / PolyU SPEED	6
Team Member (8)	Dr ASIM Muhammad / Lecturer ³	Division of Science, Engineering and Health Studies (SEHS) / PolyU SPEED	6
Project Assistant	Miss LAU Kristy Wai-ki	General Office / PolyU SPEED <i>[Funded under this IDS Project]</i>	45

Please state the **key** staff and department/unit involved in the project. Please add row(s) as necessary. Please also highlight the approved changes in project team composition and quote the date of the RGC approval for such changes.

* Refer to "Applicant" for 2015/16 exercise and "Project holder" for 2017/18 exercise onwards.

¹ Refer to "Applicant" for 2015/16 exercise and "Project holder" for 2017/18 exercise onwards.

² Dr LO Jack has retired and Prof LEUNG Chun Wah was appointed as the Interim Director of PolyU SPEED in November 2022 – January 2024. PolyU had informed RGC about the appointment. Thus, Prof LEUNG served as the Project Holder and Team Leader of this IDS project until 31 December 2023.

³ Replacement of the two resigned Team Members: Dr ZHOU Ivy Quan (January 2021) and Dr CHEN Cindy Yi (April 2021). Approvals are obtaining from RGC in February and May 2021, respectively.

3. Project Duration

	Original	Revised	Date of RGC / Institution Approval (must be quoted)
Project Start Date	01/01/2021	N/A	N/A
Project Completion Date	31/12/2023	N/A	N/A
Duration (in month)	36 months	N/A	N/A
Deadline for Submission of Completion Report	31/12/2024	N/A	N/A

4. Project Objectives

Summary of objectives addressed / achieved:

Objectives*	Percentage Achieved	Remarks**
1. To procure funding from various sources to support research projects/activities in dealing with the community and environmental problems.	1. 100%	-
2. To provide consultancy services to the Government/ industry sectors in solving related community and environmental problems and providing relevant seminars/conferences.	2. 100%	-
3. To enhance our research network through performing joined research projects with leading scholars/ researchers of other universities.	3. 100%	-
4. To contribute new knowledge to academic sectors by presenting research findings via international conferences or refereed journals.	4. 100%	-
5. To underpin teaching with knowledge created from research and development works. Efforts will be made to: (i) provide final year projects; (ii) update and improve subject syllabuses and programme curricula.	5. 100%	-
6. To nurture research students and undergraduate students with research experience.	6. 100%	-

* Please refer to the originally approved objectives. If there are changes in objectives, please highlight the changes and quote the date of RGC approval for such changes.

** Please provide reasons for significant slower rate of progress when compared with the approved implementation timetable.

5.4 Please attach photo(s) of acknowledgement of RGC-funded activities / facilities / equipment.

Please refer to the **Appendix 1**.

6. Research Outputs

6.1 What are the accomplishments of the project?

- (i) *Please provide reports on conference, seminar, workshop, exchange programmes or other activities held (if applicable).*

(Please provide details of the activities organized, including the theme / objectives of the activities, targeted participants, attendance, analysis of participants, e.g. country of origin, research background, etc., evaluation forms of the activities and a summary of the participants' evaluation. Photos of the activities are preferred.)

Symposium and Conference Deliverables

The RCGETB has successfully organised **three Symposium and Conferences** over the period from 2021 to 2023, with one conference held each year. Each event was well structurally planned with strategic areas within the fields on smart transport, green technologies, sustainable development, etc, for research excellence and industry collaboration. For details, please refer to the **Appendix 2**.

Research Seminar Deliverables

The RCGETB has successfully organised **18 Research Seminars** over the period from 2021 to 2023. These 18 Research Seminars have collectively attracted attendance of 915 instances, reflecting high engaging from academic and research community. Feedback from participants have been positive, with nearly 90% of attendees expressing very satisfactory of the Research Seminars, in terms of the research works, presentation materials and the arrangement. Summary of the activities of Research Seminars are presented in **Appendix 3**.

Research Workshop Deliverables

The RCGETB has successfully organised 17 Research Workshops over the period from 2021 to 2023. These 17 Research Workshops have collectively attracted 400 instances of attendance, reflecting high engaging from research community and student alike. Participant feedback regarding these Research Workshops have been positive, with approximately 85% of attendees rating their technical learning experiences as highly satisfactory, reflecting the quality of technical teaching, presentation themes and overall workshop organisation. For detailed summary of the activities conducted during these 17 Research Workshops, please refer to the **Appendix 4**.

- (ii) *Please provide reports on asset purchase such as acquisition of research facilities, communal equipment, software licence, dataset and / or status of infrastructure / physical research structure building such as research centre, research supporting unit (if applicable).*

(Please provide supporting documents and / or photos, and provide the utilization rate.)

- (iii) *Please provide reports on research activities carried out (if applicable).*

Consultancy Projects and Services Deliverables

During the covered reporting period, the RCGETB has successfully completed nine consultancy projects and services. These initiatives have covered across various sectors, including government, industry, and commercial enterprises, highlighting RCGETB's versatile and impactful engagement. Each project was tailored to meet the specific needs of our stakeholders, ensuring that the up-to-date solutions

provided were both practical and innovative in RCGETB strategic area fields, and reinforcing RCGETB's commitment to applying research for tangible benefits. For a detailed summary of each project, including the objectives, outcomes, and impacts, please refer to **Appendix 5**.

- 6.2 Please describe where and how the IDS Research Infrastructure Grant project assisted in building up the research capacity of the institution in its strategic areas (e.g. has the IDS Research Infrastructure Grant project facilitated the academics in formulating their research proposals under the Faculty Development Scheme, etc.).

Strengthening the Research Foundations at RCGETB

The RCGETB has significantly strengthened its research foundation, leveraging this IDS Project to enhance PolyU SPEED's strategic research areas in green technologies and/or business, including desiccant-enhanced evaporative cooling systems, development of green fuels, green tourism and implementation, sustainable materials, learning-based aerial swarm fights hill fires, etc.

Research Output and Academic Enhancement

During 2021 to 2023, RCGETB Team Members and PolyU SPEED academic members have produced a diverse array of research outputs, including numerous journal articles, conference presentations, proceedings, and research proposals for externally competitive research grants. Such productivity not only demonstrates enhanced research capabilities among RCGETB and PolyU SPEED academic members but also enriches the academic discourse in our strategic areas in aforementioned green technologies and/or business.

Research Proposals and Funding Success

The RCGETB has been instrumental in supporting the formulation of research proposals. Throughout the project period, a total of 30 research proposals were developed, many of which were submitted under the Faculty Development Scheme (FDS) and the Interdisciplinary Research Scheme (IIDS). This surge in proposal generation has increased RCGETB's potential for securing additional funding and advancing our research goals.

Enrichment of Research Resources

PolyU SPEED's research infrastructure has seen substantial improvements, including the acquisition of advanced hardware and software tools. Also, the establishment of comprehensive laboratory settings has provided our academic members with essential resources and equipment, facilitating more robust and innovative research activities.

Development of Research Collaboration

The RCGETB has enabled significant expansion in PolyU SPEED's research networks, fostering collaborations with external and international organisations, universities, and professionals. These partnerships have not only strengthened PolyU SPEED's research network but have also enhanced our global engagement and outreach. The RCGETB has also formed a "Industry Liaison Group" in 2021 to enhance communication between the industry and our academic members in a proactive way for the whole institution, such that the RCGETB may exchange views with the industry on the latest research development and the available consultancy services provided by our academic members, including but not limited to the engineering. Such "Industry Liaison Group" is functional as a meaningful platform for our academic members to update the industry leaders and listen to their views on the hot topics related to the research development working toward shaping effective and productive research activities and consultancy services, which will be the key in positing us to be a strong industrial partnership-based institution.

Cultivating a Collaborative and Interdisciplinary Research Culture

The RCGETB values collaborative and interdisciplinary research, distinguishing PolyU SPEED from traditional discipline-based themes. The RCGETB along with PolyU

SPEED have established “Green Research Hub” that not only bring together local and international communities focused on cutting-edge research initiatives in green business and technologies to the areas of accounting, finance, supply chain, tourism, advanced materials, alternative fuels, electric vehicles, noise control and refrigeration, etc, but also promote research dissemination through conferences, workshops, seminars, and calls for papers, such interdisciplinary themes reflecting the challenges of globalization and its impact on PolyU SPEED’s strategic research areas. The RCGETB has played a model in fostering and expanding research collaborations with universities, industry partners, and commercial sectors. This collaborative framework not only amplifies the scope and impact of our research but also aids academics in formulating robust research proposals under the external research grants.

Support and Develop Critical Mass

The RCGETB has been instrumental in enhancing the research capabilities of PolyU SPEED, particularly within its strategic areas of Green Energy, Transport, and Building. Through the RCGETB, the project has actively supported the development of a critical mass of skilled researchers dedicated to addressing real-world challenges in these sectors. This initiative has significantly strengthened our institution’s ability to produce high-impact scholarly activities and facilitated the continuous transfer of knowledge and technology.

Building a Substantial Research Culture

The RCGETB proactively and significantly contributed to fostering a vibrant research culture at PolyU SPEED. By providing ample opportunities for academic exchange and enhancing the research capabilities of our academic members, RCGETB supports ongoing training and access to methodologies essential for cutting-edge research.

6.3 If the project has not met its original objectives, why?

N/A

6.4 (a) Please provide details e.g., title, authorship, publication dates, etc. and attach an abstract of each publication reported. Please place asterisks on publications involving inter-institutional collaborations.

Summary of All Publications for 2021 and 2022

All journal articles, conference papers, conference proceedings, and book chapters, etc, published in the year 2021 were detailed in the 1st Annual Progress Report. Similarly, publications from the year 2022 were thoroughly compiled and presented in the 2nd Annual Progress Report.

Recent Year Publications (2023)

The details of RCGETB’s 2023 publications, which include journal articles, conference papers, conference proceedings, and book chapters, have been compiled and are included in **Appendix 6**.

(b) RGC funding should have been acknowledged in all activity(ies) / publication(s) / conference(s) papers listed in (a) above. If no acknowledgement has been made in any of the event / publication / paper, please indicate and provide explanations.

N/A

6.5 Research staff trained

(Please provide names and capacities of research staff trained and elaborate on what training has been provided.)

Extensive Training Activities

Throughout the reporting period, the RCGETB have organized a robust series of Conferences, Symposium, Research Seminars and Research Workshops, etc. These research activities have been instrumental in providing our academic members, research

staff members and undergraduate students with exposure to the latest research trends, methodologies, and essential skills within their respective fields. Details are available in **Appendix 1 - 4.**

Engagement with Renowned Experts

The RCGETB had the privilege of hosting renowned scholars, industry leaders, and experts from various domains who shared their insights and knowledge. These interactions have not only enriched PolyU SPEED research staff understanding but also aligned our research practices with global standards. Details are available in **Appendix 1 - 4.**

Focus Areas of Training

The above-mentioned training activities has covered a wide range of topics, tailored to inter-disciplinary research on green energy and transport, electric vehicles and smart transportation, smart grid, etc. This included advanced research methodologies, data analysis techniques, and emerging research trends. Details are available in **Appendix 1 - 4.**

6.6 Specific products

(e.g. patents, software or netware, instruments or equipment, infrastructure developed)
N/A

6.7 Other education activities and / or training and development

In addition to the abovementioned research staff training, the RCGETB has been committed to enhancing the other education activities and training in order to offer research experience for undergraduate students. Throughout the report period, RCGETB has successfully supervised 51 final-year undergraduate students, who participated in various research projects under RCGETB. These experiences are not only providing practical, hands-on training, but also complementing the students' research knowledge and preparing them for future challenges in focus research area. A summary of all undergraduate student training activities conducted from 2021 to 2023 is provided in **Appendix 7.**

6.8 Please highlight any deliverables indicated in the project implementation timetable endorsed by RGC, which have not been covered or achieved as per sections 6.1 to 6.7 above, and explain / elaborate.

N/A

6.9 Please elaborate the role of the managing team in coordinating and managing the project.

The Research Centre for Green Energy, Transport and Building (RCGETB) is managed and operated under the guidance of the RCGETB Committee. The Committee chaired by the Team Leader **Prof LEUNG Chun-wah** and supported by staff from the CPCE Research Office (Secretary) and RCGETB Project Assistant (Assistant Secretary).

The core responsibilities of the RCGETB are organised into three primary areas:

- (a) Seminar/Conference Organization Sub-Committee; and
 - (b) Laboratory Development Sub-Committee; and
 - (c) Research Personnel/Student Sub-Committee.
-

Each of these key areas is overseen by the corresponding Sub-committee, who report directly to the RCGETB Committee during the scheduled monthly meetings. For Details, please refer to the **Appendix 8.**

7. Awards And Recognition

7.1 Have any research grants been awarded that are **directly** attributable to the results

obtained on this IDS Research Infrastructure Grant project? (*Please provide details*)

From 2021 to 2023, in conjunction with the preparatory groundwork prior to the commencement of this UGC/IDS(R)24/20 project, the RCGETB has notably succeeded in securing and stimulating a substantial number of research grants. RCGETB has successfully secured funding for 13 projects under the Faculty Development Scheme, along with one project under the Inter-Institutional Development Scheme. In total, these projects have been awarded an amount of HK\$11,241,249.00. This success is particularly dominated within the domains of Research Grants Council (RGC)'s Competitive Research Funding Schemes for the Local Self-financing Degree Sector, e.g. Faculty Development Scheme (FDS). With the support from the RGC to this UGC/IDS(R)24/20 project, PolyU SPEED has significantly enhanced and fortified its research capacity and activity within the self-financing (SF) sector of higher education that it has never imagined. This significant development are summarised and presented in **Appendix 9**. More details of achievement are also available in the submitted 1st Annual Progress Report and 2nd Annual progress Report.

7.2 Other awards and recognitions as a result of this IDS Research Infrastructure Grant project (*Please specify*)

In June 2023, the PolyU SPEED was honored to receive a substantial donation of HK\$5 million from the . This generous donation has facilitated the establishment of the “KML Prize – Technicality” aimed at promoting innovative research into sustainable alternatives to plastics. This donation not only underscores the pioneering role of PolyU SPEED in research within the self-financed tertiary education sector but also highlights RCGETB's commitment to addressing some pressing environmental challenges. The KML Prize – Technicality is a testament to RCGETB's ongoing efforts to push the boundaries of knowledge and make impactful contributions to society. Following this initial contribution, the KML Foundation has further extended its support by funding three Research Prizes in 2023/24 as presented in **Appendix 10**.

8. Other Impacts

8.1 What are the current and expected impacts of the project in terms of its contribution to the local and regional economic and societal well-being? (*e.g., technology transfer, collaboration with external organizations, etc.*)

The RCGETB has fostered a dynamic interchange between academia and industry by hosting Symposiums, Conferences, Research Seminars, and Research Workshops and made substantial contributions to both the local and regional economic and societal well-being throughout its extensive scholarly exchange activities, international research collaborations, and disclosure of research findings. A key initiative, the “Green Research Hub” has catalyzed advancements in several strategic areas such as desiccant-enhanced evaporative cooling systems, green fuels, green tourism, noise control, and sustainable business practices, etc. These technologies, outlined in the **Appendices**, have significantly propelled research excellence within the PolyU SPEED. This RCGETB's vigor has inspired PolyU SPEED to escalate its research efforts, now publishing 200+ journal articles annually and hitting 80 active projects with external funding for the whole institution in which spanning diverse collaborative efforts worldwide, significantly enhancing our research network. In response to these successful outcomes of RCGETB, PolyU SPEED has launched new Postgraduate

Degree Programmes previously unavailable, including the Master of Science in Green Business Management, Master of Science in Health Services Management, and Master of Science in Smart Engineering and Construction, offered in both full-time and part-time modalities. Some of these programs comprehensively cover major areas in green technologies benefiting communities across different regions. Guided by RCGETB's achievements, in future it is committed to several strategic objectives of PolyU SPEED by developing a critical mass of competent researchers within PolyU SPEED, addressing real-life problems in Green Energy, Transport, and Building, continuing the transfer of knowledge and technology through high-impact scholarly activities, and enhancing our research collaborations with universities, industries, and commercial sectors. RCGETB's dedication to these goals ensures that the RCGETB not only meets but exceeds our planned objectives, this commitment to excellence in research infrastructure profoundly influences the societal and economic well-being of our regions, positioning PolyU SPEED as a key supporting higher education institution in sustainable technological advancements.

8.2 Others (*Please specify*)

N/A

9. Statistics on Research Outputs

	Peer-reviewed Journal Publications	Conference Papers	Scholarly Books, Monographs and Chapters	Patents Awarded	Other Research Outputs (please specify)	
No. of outputs arising directly from this project	76	41	5	0	Type	No.
					0	0

10. Sustainability of The IDS Research Infrastructure Grant

10.1 Whether there are new ideas evolved **directly** from the project?

The RCGETB targets to support and develop critical mass of competent researchers within PolyU SPEED, addressing real-life problems in Green Energy, Transport, and Building, continuing the transfer of knowledge and technology through high-impact scholarly activities including:

- a. Desiccant-enhanced evaporative cooling systems;
- b. Development of green fuels;
- c. Development of green tourism and its implementation;
- d. Development of sustainable materials;
- e. Learning-based aerial swarm fights fill fires;
- f. Noise control with metamaterial technologies;
- g. Roadmap of popularization of electric vehicles;
- h. Sustainable business research.

10.2 Whether there are new projects evolved **directly** from the project?

As reported, the RCGETB has successfully secured funding for 13 projects under the Faculty Development Scheme, along with one project under the Inter-Institutional Development Scheme. In total, these projects have been awarded an amount of HK\$11,241,249.00 as presented in **Appendix 9**.

To recap, the RCGETB has successfully completed nine consultancy projects and services covered across various sectors, including government, industry, and commercial enterprises, highlighting RCGETB's versatile and impactful engagement. For a detailed summary of each project, including the objectives, outcomes, and impacts, please refer to **Appendix 5**.

In addition, the RCGETB also received donation from the . Under the donated "KML Prize – Technicality", the KML Foundation has further extended its support by funding three Research Prizes in 2023/24 as presented in **Appendix 10**.

10.3 Whether there are new collaborations developed **directly** from the project?

The RCGETB has eaged in fostering research collaborative partnerships with a variety of prestigious and international universities and industry professionals. Details of these expanding networks and collaborative efforts are documented through co-authorship in publications presented in **Appendix 6** and further elaborations are available in research networking activities presented in **Appendices 2, 3, and 4**.

Also, the formation of the "Industry Liaison Group" has provided a structured platform to further broaden our research collaborations and networking initiatives.

Below are more examples of new collaborations developed through the RCGETB platforms:

- PI Professor LEUNG Chun-wah collaborated with The Hong Kong Polytechnic University (PolyU) on the FDS-funded project titled "Theoretical Investigation and Control Scheme Development of a Compact Desiccant-enhanced Evaporative Cooling System" (UGC/FDS24/E03/20).
- Dr WU Andrew Yang engaged with the University of New South Wales (UNSW) and the International Business University of Canada for the project "Emerging Research Directions on Adoption of Electric Vehicles for the Development of Smart Cities through Complementary Policy and Green Financing: GBA as the Cluster for Technological Innovation" (UGC/IIDS24/E01/20). He also worked with UNSW and the University of Macau on "Development of a Multi-agent Behavior Model and Optimization of Charging Station Map for Implementation of Electric Taxis in Hong Kong - a Pilot Study" (UGC/FDS24/E08/21).
- Dr LAM Wai-ming partnered with PolyU and The Hong Kong Institute of Architects for "Development of a Cloud-Based System to Facilitate End-User-Oriented Design (EOD) for Effective Sustainability Practices Implementation in High-Rise Residential Buildings" (UGC/FDS24/E02/21).
- Dr LOH Anthony Wai-keung collaborated with the University of Kent and Xi'an Jiaotong-Liverpool University on several projects addressing environmental challenges and innovative HVAC strategies, examples are "Vertical dispersion model of road traffic-emitted particulate matters and noise" (UGC/FDS24/E12/21) and "Exploring the Use of Sonic Crystal in Noise Barriers" (UGC/FDS24/E12/23).
- Dr LAU Yui-yip worked with multiple international universities, i.e. The Hang Seng University of Hong Kong, Technological and Higher Education Institute of

Hong Kong, Khon Kaen University, Beijing Normal University – Hong Kong Baptist University United International College, and Liverpool John Moores University, on the project “Rebuilding Port and Resilient Maritime Supply Chain Networks in Asia” (UGC/FDS24/B07/22).

- Dr LIANG Junot Shanjun and Ir Dr WONG Ka-chung developed significant collaborations with Xi’an Jiaotong-Liverpool University for projects enhancing public safety and substation maintenance, e.g. “From Theories to Utilization: Development of a Learning-Based Aerial Swarm for Hong Kong Public Fire Services Applications” (UGC/FDS24/E02/22) and “CFD-based Autonomous System of Health Estimation and Maintenance Scheme for Electrical Apparatus of Power Substations in Hong Kong” (UGC/FDS24/E08/23).
- Dr ASIM Muhammad has initiated industry partnership, i.e. Exponent, focusing on innovative solutions in thermal management on FSD-funded project title “An Innovative Hybrid Nanofluid Spray Cooling Based Thermal Management System for Efficient Cooling of Electric Vehicle High Power Electronics” (UGC/FDS24/E09/23).
- Dr NG Sun-pui have initiated academic partnership with PolyU focusing on innovative solutions in sustainable materials for healthcare applications on FDS-funded project titled “Development of Mycelium-Based Composites with Enhanced Mechanical and Thermal Properties for Diabetic Foot Insoles” (UGC/FDS24/E15/23).

These research collaborations proved RCGETB’s commitment to fostering meaningful partnerships that drive forward RCGETB’s collective research agendas.

10.4 Please give details on how much money and from which sources has been obtained for the specific purpose of continuing the work started under this IDS Research Infrastructure Grant project.

Over the recent period, RCGETB has notably enhanced its research capabilities in several strategic areas, This progress is largely due to the formation and ongoing operations of the Research Centre, which have facilitated a nurturing environment for academic and practical research pursuits. A key highlight in our journey has been the successful securing the external funding. RCGETB has cultivated numerous externally funded research grants that are instrumental in supporting our targeted research areas. Additionally, we are grateful to have received a generous donation of HK\$5 million from the . This substantial contribution underscores the trust and expectation placed in our research endeavors. Further strengthening our financial foundation, internal support from PolyU SPEED has been secured. The CPCE Research Funds, managed by the CPCE Research Committee, will continue to play an essential role in fostering research excellence at RCGETB. This commitment ensures sustained support for our research activities, promising a robust future for the RCGETB.

11. Public Access Of Completion Report

(Please specify the information, if any, that cannot be provided for public access and give the reasons.)

Information that Cannot Be Provided for Public Access	Reasons
<p>Appendices 1 to 10 and information related to “Koo Meng Li and Koo Mi Wen Na Charitable Foundation Limited (KML Foundation)”</p>	<p>The Appendices might not be suitable for disclosure, due to the presence of classified information, personal details of stakeholders, and internal documentations. In order to protect operational security, individual privacy of our internal processes, access to these documents might be restricted for confidentiality purposes.</p> <p>The non-disclosure of information related to the “Koo Meng Li and Koo Mi Wen Na Charitable Foundation Limited (KML Foundation)” as respect the wishes to maintain confidentiality.</p>

RGC Ref. No.:

UGC/IDS(R)24/20

(please insert ref. above)

**INSTITUTIONAL DEVELOPMENT SCHEME (IDS)
RESEARCH INFRASTRUCTURE GRANT**

Summary of Completion Report

(Please list all the stages since project inception)

Project Title: Establish the Research Centre for Green Energy, Transport
and Building in PolyU SPEED

Stage Completed	Period (Month / Year) to (Month / Year)						Milestones	
							Deliverables to be Achieved ² (Please summarize in <u>three</u> bullet points where details should be left to the report proper)	% of Each Deliverable Achieved ³
1	01/2021 - 12/2021						1. Submit 4-6 external-funded research proposals (Actual: 9 submissions. Funded: 3 FDS, 1 IIDS and 1 HMRF) 2. Publish 8 journal and 8 conference papers (Actual: publish 46 journal and 19 conference papers) 3. Offer 1 conference and 3-4 seminars/workshops (Actual: offer 1 1-day conference, 5 seminars and 7 workshops)	1.100% 2.100% 3.100%

Stage Completed	Period						Milestones	
	(Month / Year) to (Month / Year)						Deliverables to be Achieved² (Please summarize in <u>three</u> bullet points where details should be left to the report proper)	% of Each Deliverable Achieved³
2	01/2022 - 12/2022						1. There are 4 research proposals funded by RGC/FDS with very significant collaboration from other universities. 2. We have published 61 refereed journal papers with very significant external collaboration. 3. We offer 1 conference, 6 seminars and 6 workshops.	1. 100% 2. 100% 3. 100%
3	01/2023 - 12/2023						1. Secured 8 external grants proposal (5 from RGC and 3 from KML) with significant collaboration. 2. Published 15 referred journal articles, 4 book chapters and 5 conference papers with significant external collaboration. 3. Launched 1 Conference, 8 Research Seminar and 8 Research Workshops	1. 100% 2. 100% 3. 100%
Total to-date:								

Note: ¹ Justifications for significant under-spending or over-spending ($\geq \pm 10\%$) should be given in **section 5.1** of the completion report.

² The key milestones to be achieved by the project within the respective stage as indicated in the approved implementation timetable.

³ Justifications for significant slower rate of progress compared with the approved implementation timetable should be provided in detail in **section 4** of the completion report.