



**FINAL REPORT**  
**EXPLORATORY RESEARCH GRANT SCHEME (ERGS)**  
*Laporan Akhir Skim Geran Penyelidikan Eksploratori (ERGS) IPT*  
*Pindaan 1/2015*

**A RESEARCH TITLE:** The development of an algorithm and a model through image processing and remote sensing techniques for assessing environmental impacts of routine carbon footprint in Peninsular Malaysia

**PHASE & YEAR:** 1 / 2012

**START DATE:** 1 Ogos 2012

**END DATE:** 31 Julai 2014

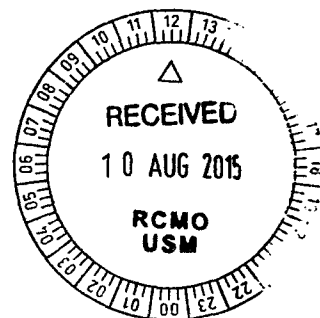
**EXTENSION PERIOD (DATE):** RMC LEVEL: 31 Julai 2015

KPM LEVEL: 31 Julai 2015

**PROJECT LEADER:** Professor Dr. Mohd. Zubir Bin Mat Jafri

**I/C / PASSPORT NUMBER:** 620325 08 6509

- PROJECT MEMBERS:**
1. Assoc. Prof. Dr. Lim Hwee San
  2. En. Wong Chow Jeng
  3. Assoc. Prof. Dr. Khiruddin Abdullah
  4. En. Sim Chong Keat



**PROJECT ACHIEVEMENT** (*Prestasi Projek*)

ACHIEVEMENT PERCENTAGE			
Project progress according to milestones achieved up to this period	0 - 50%	51 - 75%	76 - 100%
Percentage			✓
RESEARCH OUTPUT			
Number of articles/ manuscripts/ books <i>(Please attach the First Page of Publication)</i>	Refereed Journal	Non-Refereed Publication	
	3		
Conference Proceeding <i>(Please attach the First Page of Publication)</i>	International	National	
	12		
Intellectual Property <i>(Including Paten, Copyright, Industrial Design, layout Design of Integrated Circuit &amp; Trademarks)</i>			


HUMAN CAPITAL DEVELOPMENT					
Human Capital	Number				Others (please specify)
	On-going		Graduated		
Citizen	Malaysian	Non Malaysian	Malaysian	Non Malaysian	
<b>No. PHD STUDENT</b>	1		1	1	
Student Fullname: IC / Passport No: Student ID:	Sim Chong Keat 830717075767 / P-ZD0001/13(R)		Dr. Tan Kok Chooi 860625386143/ P- ZM0016/08(R)	Dr. Khuram Ali KH525442/ P- ZD0028/10(R)	
<b>No. MASTER STUDENT</b>					
Student Fullname: IC / Passport No: Student ID:					
<b>No. UNDERGRADUATE STUDENT</b>			6		
Student Fullname: IC / Passport No: Student ID:			1. Khor Wei Ying 910326025164 / 109233 2. Pang Siaw Kian 900425138544/ 109288 3. Sylvester Engkana Anak Pillay 930202135765 /117099 4. Chew Boon Wei 920209075540/ 117032 5. Wong Chui Qeen 921222085270/ 117106 6. fakrurazie bin zulkifli 910506085033/118032		2 Industrial trainees as research Assistant 1. MUHAMMAD HAZIM BIN SHABUDIN ( 931003075397) 2. KHAIRUNNISA BINTI HANAFI CHIA ( 921006025978)
<b>Total</b>					

**EXPENDITURE (Perbelanjaan)**

**C** Budget Approved (Peruntukan diluluskan) : **RM 87,000.00**  
Amount Spent (Jumlah Perbelanjaan) : **RM 87,028.68**  
Balance (Baki) : **RM - 28.68**  
Percentage of Amount Spent : **100.03 %**  
(Peratusan Belanja)

**ADDITIONAL RESEARCH ACTIVITIES THAT CONTRIBUTE TOWARDS DEVELOPING SOFT AND HARD SKILLS**  
(Aktiviti Penyelidikan Sampingan yang menyumbang kepada pembangunan kemahiran insaniah)

D		
International		
Activity	Date (Month, Year)	Organizer
(e.g : Course/ Seminar/ Symposium/ Conference/ Workshop/ Site Visit)	SPIE Photonics Europe, 14 -17 April 2014, Munich Germany	SPIE

National		
Activity	Date (Month, Year)	Organizer
(e.g : Course/ Seminar/ Symposium/ Conference/ Workshop/ Site Visit)		
<b>E PROBLEMS / CONSTRAINTS IF ANY</b> ( <i>Masalah/ Kekangan sekiranya ada</i> )		
Budget constraint		
<b>F RECOMMENDATION</b> ( <i>Cadangan Penambahbaikan</i> )		
Increase the budget allocation		
<b>G RESEARCH ABSTRACT – Not More Than 200 Words</b> ( <i>Abstrak Penyelidikan – Tidak Melebihi 200 patah perkataan</i> )		
<p>This research develop the prediction models which analyze and compute the CO<sub>2</sub> emission in Malaysia. Each prediction model for CO<sub>2</sub> emission is analyzed based on three main groups which is transportation, electricity production and consumption as well as residential and industry. The prediction models was generated using data obtained from World Bank Open Data. Partial least square and best subset method were used to remove irrelevant data and followed by multi linear regression to produce the prediction models. From the results, high R-square (prediction) value was obtained and this imply that the models are reliable to predict the CO<sub>2</sub> emission by using specific data. The results of the prediction model with the measured data showed a high correlation coefficient (adjusted R<sup>2</sup>=96.75%) with predicted R<sup>2</sup>=94.19%, indicating the model's accuracy and efficiency. These results are encouraging and accurate and can be used in early warning of the population to comply with air quality standards.</p>		
Date : 10/8/2015 Tarikh	Project Leader's Signature: Tandatangan Ketua Projek	
<b>H COMMENTS, IF ANY/ ENDORSEMENT BY RESEARCH MANAGEMENT CENTER (RMC)</b> ( <i>Komen, sekiranya ada/ Pengesahan oleh Pusat Pengurusan Penyelidikan</i> )		
<p>Maklum Bandawan Bagi Geran Negatif</p>		
Name: Nama:	Signature: Tandatangan:	
Date: Tarikh:	 12/8/15	