

THE DRIVERS OF ECO-PROCESS INNOVATION: EMPIRICAL EVIDENCE IN  
MALAYSIA HALAL HUB FOOD INDUSTRY

NABIHAH BINTI MASIJAN

Universiti Teknikal Malaysia Melaka (UTeM)

## SUPERVISOR VALIDATION

I hereby declare that I have read this thesis and in my opinion this project is  
sufficient in terms of scope and quality for the award of  
Bachelor of Technology Management (Innovation Technology)

Signature : .....

Supervisor's Name : .....

Date : .....

Signature : .....

Panel's Name : .....

Date : .....

THE DRIVERS OF ECO-PROCESS INNOVATION: EMPIRICAL EVIDENCE IN  
MALAYSIA HALAL HUB FOOD INDUSTRY

NABIHAH BINTI MASIJAN

This thesis is submitted in partial fulfillment of the requirement for the award of  
Bachelor of Technology Management (Technology Innovation)

Faculty of Technology Management and Technopreneurship  
Universiti Teknikal Malaysia Melaka (UTeM)

JUNE 2017

## DECLARATION

I hereby declare that the report has been prepared by my own self except the summaries and citation that I have been clarify the resources.

Signature : .....

Name : .....

Date : .....

## **DEDICATION**

For my sweet and loving,  
my amazing father and mother whose sacrificial care for me

Masijan bin Mohd Noor & Tukinam Binti Banon.

And to my supportive siblings,  
Norazlina, Mohd Redzuan, Mohd Aizat and Nurul Fatin Atikah

Thank you.

## **ACKNOWLEDGEMENT**

Bismillahirrahmanirahim, First of all, I would like to express my gratitude to my great supervisor Dr. Nurulizwa for his continuous efforts in guiding and support us in term of advice doing thesis report for Final Year Project, and evaluating thesis.

My humble gratitude towards both of my parents, Masijan Bin Mohd Noor and Tukinam Binti Banon for their supportive and meaningful advice for me throughout this thesis making. I also want to thank to all my final year project team. Lastly, thank you to all who are directly and indirectly helping me out finishing my report thesis of Final Year Project.

## ABSTRACT

Eco-process innovation is application which reduce material consumption and risks as well as resulting in cost savings, replacement of unsafe inputs during operation, optimization of the production process (e.g. resource efficiency), reducing the damaging impacts of operation outputs (e.g. waste). This study aim to determine the level of eco-process, identify the drivers of eco-process innovation practices and the most of the influential external factors that affect the implementation of eco-process innovation. The methodologies are descriptive to collect data through Malaysia Halal Hub Food industry. The finding, this study found that regulation pressure has become a critical issue and lack of enforcement. Despite that fact that eco-innovation inspection activities to comply with regulations pressure are carried out periodically by the studied firms, the challenges in demand and competitive pressure potential benefits have remain evident. The findings of this study to assist the government led policies and entrepreneur, as well as private sector and citizen initiatives, that seek to enhance liveability in Malaysia. Furthermore, to encourage society to go to sustainability development for future life quality. In conclusion, Malaysia has already embarked on a path towards the green city by the year 2020. Malaysia has to pursue low-carbon growth by ensuring carbon emission be reduced by up to 40% by the year 2020.

**Keyword:** eco-process innovation, sustainability development, halal food industry

## **ABSTRAK**

*Eco-proses inovasi ialah aplikasi yang mengurangkan penggunaan bahan dan risiko serta menghasilkan penjimatan kos, penggantian input yang tidak selamat semasa operasi, pengoptimuman proses pengeluaran (contohnya kecekapan sumber), mengurangkan kesan merosakkan output operasi (contohnya sisa). kajian ini bertujuan untuk menentukan tahap eco-proses, mengenal pasti faktor amalan inovasi eco-proses dan sebahagian besar factor luaran yang mempengaruhi pelaksanaan eco-proses inovasi. Metodologi pembelajaran ini menggunakan deskriptif untuk mendapatkan data di Malaysia Halal Hub Industri makanan. Kajian ini mendapati bahawa tekanan peraturan telah menjadi satu isu kritikal dan kekurangan penguatkuasaan. Walaupun fakta bahawa aktiviti pemeriksaan eco-inovasi mematuhi peraturan dijalankan secara berkala oleh firma yang dikaji, cabaran dalam permintaan dan tekanan persaingan memberi manfaat yang berpotensi jelas. Hasil kajian ini membantu kerajaan pimpinan dasar dan usahawan, dan juga inisiatif sektor dan warganegara persendirian, yang bertujuan untuk meningkatkan kesesuaian untuk didiami di Malaysia. Tambahan pula, hal ini menggalakkan masyarakat menuju ke arah pembangunan yang mampan dan meningkatkan kualiti hidup masa depan. Kesimpulannya, Malaysia telah memulakan jalan ke arah bandar hijau menjelang tahun 2020. Malaysia perlu mencapai pertumbuhan rendah karbon dengan memastikan pelepasan karbon dapat dikurangkan sehingga 40% menjelang tahun 2020.*



## TABLE OF CONTENT

<b>Topic</b>	<b>Page</b>
<b>DECLARATION</b>	<b>II</b>
<b>DEDICATION</b>	<b>III</b>
<b>ACKNOWLEDGEMENT</b>	<b>IV</b>
<b>ABSTRACT</b>	<b>V</b>
<b><i>ABSTRAK</i></b>	<b>VI</b>
<b>TABLE OF CONTENT</b>	<b>VII</b>
<b>LIST OF FIGURE</b>	<b>XII</b>
<b>LIST OF SYMBOLS</b>	<b>XIII</b>
<b>LIST OF APPENDICES</b>	<b>XIV</b>
<b>CHAPTER 1</b>	<b>1</b>
<b>INTRODUCTION</b>	<b>1</b>
1.1 Introduction	1
1.2 Research Background Of Study	1
1.2.1 Sustainability Development	2
1.2.2. Environment Sustainability Policy in Malaysia	4
1.3 Research Problem of Study	5
1.4 Research Objective of Study	7
1.5 Research Question of Study	7
1.6 Scope Of Study	8
1.7 Significant Of Study	8
1.8 Summary	9

<b>CHAPTER 2</b>	<b>10</b>
<b>LITERATURE REVIEW</b>	<b>10</b>
2.1 Introduction	10
2.2 The Role of Manufacturing Industry in Malaysia	10
2.2.1 The Important Food Industry in Malaysia	14
2.2.2 The important of halal food in Malaysia	17
2.3 The Important role of Eco-Innovation to enhance sustainability development	19
2.4 Type of Eco-Innovation	23
2.5 Driver towards Eco-Process Innovation	25
2.6 The Driver Eco-Process Innovation Practice in Malaysia Halal Food Industry	28
2.6.1 Regulation Pressure	29
2.6.2 Demand Pressure	31
2.6.3 Competitive Pressure	33
2.7 The Eco-Process Innovation	36
2.8 Summary	37
<b>CHAPTER 3</b>	<b>38</b>
<b>RESEARCH METHODOLOGY</b>	<b>38</b>
3.1 Introduction	38
3.2 Theoretical Framework	39
3.2.1 Hypothesis Testing	40
3.3 Research Design	42
3.3.1 Questionnaire Development	44
3.3.2 Operationalization Of Construct	47
3.3.3 Operationalization of Variable	48
3.3.4 Pilot Study	49
3.4 Data Collection	50
3.4.1 Sampling Technique	50
3.4.2 Sampling Size	52
3.4.3 Key Informants	53
3.5 Data Analysis	54
3.6 Analytical tools	54
3.6.1 Validity	54
3.6.2 Reliability	55

3.6.3 Inferential method	55
3.6.4 Descriptive Analysis	57
3.7 Summary	59
<b>CHAPTER 4</b>	<b>60</b>
<b>RESULT &amp; DISCUSSION</b>	<b>60</b>
4.1 Introduction	60
4.2 Descriptive Analysis	61
4.2.1 Demographic Background of Respondent	61
4.2.2 Mean Score of Group Indicators	64
4.3 Result Reliability & Validity Analysis	68
4.4 Pearson Correlation Analysis	69
4.4.1 Correlation Analysis	70
4.5 Inferential Analysis	73
4.5.1 Multiple Regression Analysis	74
4.6 Result of Hypothesis Verification	76
4.7 Summary	79
<b>CHAPTER 5</b>	<b>80</b>
<b>CONCLUSION &amp; RECOMMENDATION</b>	<b>80</b>
5.1 Introduction	80
5.2 Discussion Finding	81
5.2.1 Relationship regulation Pressure and Eco-Process Innovation Practice	81
5.2.2 Relationship Demand Pressure and Eco-Process Innovation Practice	83
5.2.3 Relationship Competitive Pressure and Eco-Process Innovation Practice	85
5.5 Significant Implication of the Research	89
5.5.1 Contribution and Implication for Manager	89
5.5.2 Policy Maker	92
5.6 Limitation and Recommendation for Future Research	94
5.7 Conclusion	95
<b>REFERENCES</b>	<b>96</b>
<b>APPENDIX</b>	<b>103</b>

## LIST OF TABLE

<b>TABLE</b>	<b>TITLE</b>	<b>PAGE</b>
Table 2.1:	Type of Eco-Innovation	23
Table 3.1:	Operationalization of Construct	47
Table 3.2:	The Operationalization of Variable	48
Table 3.3:	Determining Sample Size for Practice Population	53
Table 3.4:	The Summary of Research Methodology	59
Table 4.1:	Type of Business and Business Income	61
Table 4.2:	Number of Employee and Year of Operation	62
Table 4.3:	Income Company and Number of Employee	63
Table 4.4:	Year of operation and Implementation Eco-process Innovation practice	63
Table 4.5:	Mean Score of Regulation Pressure	65
Table 4.6:	Mean Score of Demand Pressure	66
Table 4.7:	Mean Score of Competitive Pressure	67
Table 4.8:	Mean Score of Implementation eco-process Innovation practice	68
Table 4.9:	Result of Reliability and validity	69
Table 4.10:	Rule of Thumb about Correlation Size	70
Table 4.11:	The Correlation Regulation Pressure and	71

	Eco-process Innovation Practice	
Table 4.12:	The Correlation Demand Pressure and Eco-process Practice	72
Table 4.13:	The Correlation Competitive Pressure and Eco-process Innovation Practice	73
Table 4.14:	Multiple Linear Regression (Model Summary)	74
Table 4.15:	Multiple Linear Regression (Annova)	75
Table 4.16:	Multiple Linear Regression (Coefficient)	75
Table 4.17:	The result of Hypothesis	79

**LIST OF FIGURE**

<b>FIGURE</b>	<b>TITLE</b>	<b>PAGE</b>
Figure 2.1:	Gross Output Malaysia (GDP)	11
Figure 2.2:	Percentage Share of Gross by Manufacturing Industry Group	12
Figure 2.3:	Independent Variable and Dependent Variable	37
Figure 3.1:	Research Framework of study	39
Figure 3.2:	Step in Developing a Questionnaires	44

**LIST OF SYMBOLS**

$\beta$	=	Coefficient
$df$	=	Degree of freedom
F	=	F-test
$H_0$	=	Null Hypothesis
$H_1$	=	Alternative Hypothesis
N	=	Population
$n$	=	Sample
P	=	Significant value
r	=	Correlation coefficient
>	=	Greater
<	=	Less
+	=	Sum

**LIST OF APPENDICES**

<b>APPENDICES</b>	<b>TITTLE</b>	<b>PAGE</b>
A	Schedule Final Year 1	103
B	Schedule Final Year 2	104
C	Permission to Conduct a Survey	105
D	Questionnaire	106



## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction

This study to identify the driver of eco-process innovation in Malaysia Halal food industry. Specifically, it will about the relationship and significance external factors that influence of small medium enterprise (SME) that support to reduce the emission of hazardous substances or excess, procedure tool reprocesses left-over then release that allow aimed re-used. Also to procedure decreases the utilisation of water, electricity, coal or oil, and procedure to decreases the consumption of natural resources. This chapter consist of the discussion on the research background of study, research problem of study, research objective of study, research question of study, scope of study and significant of study

#### 1.2 Research Background Of Study

Production and consumption of food play a key role to support occupants, but at the same while is one of the most important elements that force the environment (Diya et al. 2014). Affecting towards a more sustainable development be contingent on radical changes in production and consumption patterns, that is, dynamic changes in the ways food is produced, processed, transported and consumed are crucial (del Río González 2005; Diya et al. 2014)

Companies are raising consciousness on the responsibility for their influence on the environment, and are appealing to thought social and environmental concerns when developing new products, process or organizational methods (De Medeiros et al. 2014). The environmental plan is slowly becoming an established win-win strategy in business replacing the traditional reputation of being an method that denies objectives

of development, competitiveness, and success (Hojnik & Ruzzier 2016). That is, it is not only a cost that must be taken to comply with social and government pressures (Bocken et al. 2011).

Within this situation, the conception of eco-innovation rises, not only from a theoretical but also after an applied point of view. The (OECD) describe eco-innovation as “the development of products (goods and services), processes, marketing methods, organizational structure, and new or improved institutional arrangements, which, intentionally or not, contribute to a reduction of environmental burdens in comparison with alternative practices” (OECD 2009a).

Sustainability in this study is define by the “a development that meets the needs of the present without compromising the ability of future generation to meet their own needs” (Brundtland 1987). Eco-innovation is beached in a fewer comprehensive possibility, since it encompasses limiting characteristics, as the essential code of abridged ecological burdens. Eco-innovation be able carry certain optimistic trade-offs concerning ecological qualities, for example, style, project, and appearance. Eco-innovations devise an optimistic influence on organizational and depletion practices, as well as would include social, economic and environmental measurement in their application in which to prosper towards environment growth way (Hellström 2007).

### 1.2.1 Sustainability Development

Sustainable growth was described as the growth that sees the need of the performance without co-operating the capacity of providing upcoming peers (Brundtland 1987). Nevertheless, there is no consensus on drawing what are these needs. Some authors' approaches include its dynamic characteristics (Hellström 2007; Bossle et al. 2016). Others address under the aspect of different perspectives and concerns, what directly influence perception on what are the latent needs (Banerjee et al. 2013; Schwarzin 2012). Due to an increasing level of public concern and environmental regulations, companies are raising awareness with socio-environmental issues (Banerjee et al. 2013). That is, regulatory pressures (macro level) impact public opinion, what ends up shaping companies behavior (micro level).

Development requires an economic and social progressive transformation (Brundtland 1987). Considering this, sustainable development must be a continuous process of change, which may be related to system innovations that require an integrated redesign of products, lifestyle, process and structure. In that sense, (Schwarzin 2012) worries include finding a way to include people, organizations, and communities in these transitions while recognizing all benefits of doing things in a more sustainable way.

Sustainable development also means to put together growing concerns with the environment and socio-economic issues (Abdul Manaf et al. 2013). Economics must be a function of society and environment, not the other way around. Thus, sustainable development should be based on the relationship between environment and society, with feedbacks' cycles for both sides, in which social and environmental equality are fundamental ideals (Bossle 2015).

To address sustainability challenges, (Schwarzin 2012) recommend dialogic interaction as an efficient mean to promote organizational sustainability. They propose a framework, assuming that the interaction among factors is influenced by the entire environment, current and past relationships, as well as the whole communication process. Dialogic Interaction is defined as a reflexive conversation and the involvement of heterogeneous groups of people, that explore the diversity in a respectable and collaborative way. It is known as an interaction that includes potentially high levels of community and organizational learning towards sustainability.

The ability to have together in a unique group different people, with different opinion and perspectives, requires the ability for managing and taking advantage of these interactions. Some principles must be followed to apply a dialogic dynamic (Schwarzin 2012), that is, listening and being able to put some judgments or emotional issues on standby, to better evaluate the situation. Acting calmly is also an important capability, and it means being assertive, but not aggressive, as a good strategy for managing sustainable issues within the company.

Thus, in addition to the value that must be given for sustainability by individuals, organizations should develop some skills in sustainable development

(Schwarzin 2012). With an emphasis on learning the process, these skills refer to people, organizations and communities' capacities and abilities to deal with sustainability problems. The following question remains: what are the capabilities that people, organizations, and communities need to achieve in order to change their behavior and move towards a more pro- environmental attitudes, or at least, less harmful.

In addition, transitions should present the following elements: i) multi-actors, including companies, consumers, non-governmental organizations (NGOs), producers and governments; ii) multi-factors: transitions are not caused by a single factor, they are usually a conjoint result of several factors that influence each other, these factors can be technical, regulatory, societal and derived from a change in behaviour; iii) multi-level: transitions imply changes in several levels. At the micro level, with individual actions, at meso, with a paradigm and rules structure, changing systems, and at the macro level, with the understanding of society's cultural characteristics and other aspects, such as individualism and globalization (Esders 2008).

### 1.2.2. Environment Sustainability Policy in Malaysia

According to (National et al. 2010) the growth and request of goods or process, gear and method expended to preserve the usual ecological and capitals, in order is to minimalize and decreases the negative influence of social behaviours. Thus, toward implement Environmental friendly sustainability calls for fulfillment to ecological sustainable practices in Malaysia as a low carbon, sustainable building, and infrastructure hub. Malaysia aims to minimize humiliation of the sustainability, has zero or low greenhouse gas (GHG) release, secure for usage and endorse healthy and better sustainability for all forms of life, preserve the use of energy and usual capital, and endorse the use of the renewable resource.

In addition, the mission will be a factor to accelerate the national economy and encourage environment practice. Thus, four component according to the National Green Technology Policy Malaysia to achieve sustainability development in Malaysia is energy, economy, environment and social. For the energy is to pursue to attain energy independence and promote efficient utilization. For environment is to conserve

and minimize impact on the environment. For the economy is to Enhance national economic development through the use of green technology. While for social is to improve the quality of life for all (National et al. 2010). This policy is to achieve sustainability development in Malaysia.

Furthermore using the eco-process innovation can Improve environmental sustainability via protecting natural functions and the ecosystem. This is important need to study because of the policy to achieve sustainable development and one of to remedy sustainable is through eco-process innovation. The eco-process innovation is to support environment sustainability to achieve the goal under the 11 the Malaysia plan. This make more responsible food industry will lower Co2-eq, emission and compliance with ratings will make our infrastructure more resilient and sustainable.

### 1.3 Research Problem of Study

Nowadays, we were now heading to sustainable development especially in the 21st-century sustainability for the worst in the manufacturing industry.to measure, sustainability to support eco-innovation. This justification research to identify eco-innovation cause sustainability. Sustainability in worst involves in many manufacturing. One of the remedies sustainability using eco-process innovation.

Recently, previous research in summarizing eco-innovation measurement , implementation, driver and obstacles. Greatest of the wide study in the innovation study has remained managed by the (OECD). The eco-innovation practice as reported by OECD manual reached from the introduction of new product, process, method, and organization (Rashid et al., 2014). That why the important limited study in eco-process innovation. The importance of this study is due to the fact that besides the pressure that happen since civilisation and management for a operation with less influence on the environmental friendly, the aspiration to use "green" is rising including consumers who rely on business to obtain the source of eco-innovative options.

In Malaysia, food manufacturing sector is the major contributor to the GDP. However, it's also contributed to the generation of 6.3 million of solid waste to this country according to the SWCorp. Therefore, via the introduction of (NATIONAL

GREEN TECHNOLOGY 2009) which is ecological should be a driver to accelerate the national company and encourage sustainability and to increase environmental awareness and reduce carbon footprint activities. Through Eco-process innovation is the application of procedure, and method used to conserve the natural environment and resources, which minimizes and reduces the harmful effect of social behaviours.

Though, the significant of eco-process innovation for industries is evident, obviously, in the halal food sector, those belief are being careful separately. There is a lack of studying eco-process innovations in the halal food sector and consequently, this is an area for extending research. Seeing that the OECD concept is not restricted to the intentionality of the ecological improvement, it becomes of great importance to verify what the drivers to implement practice environmental precepts. Although lately, either in the academic and practical debate, issues such as eco-innovation and sustainability are hot topics, what companies are really doing and how they are integrating those concepts into their activities and strategies is not clear.

Eco-process innovation is the main concept in this study and is considered as an end goal that can be achieved by companies, demanded by society, as a way to contribute to sustainable development. Eco-innovation can be considered as a paradigm shift related to innovation and including economic, social and environmental pillar. Green competitiveness goes beyond consumerism and is associated with companies' need to keep a good reputation (Urbaniec 2015).

In that sense, innovation is one of the key areas for building capacity for enabling countries and nations to move towards sustainable development in the food sector (OECD 2009a). Therefore, there is a need to study companies that are already applying these concepts of eco-process innovation and sustainability in their strategies. That why this is an urgent call to study eco-process innovation in food industry just make this research important to filled up the gap in the research by conducting empirical evidence.

#### 1.4 Research Objectives of Study

This current research is to identify the driver that effect the eco-process innovation in Malaysian halal food industry. There are several research objectives that this study attempts to achieve, which are to:

- I. To determine the level of environment regulation, demand pressure and competitive pressure and implementation eco-process innovation practices in SME Malaysian halal food industry.
- II. To identify the drivers of eco-process innovation practices in SME Malaysian halal hub food industry.
- III. To determine the most of the influential factors that affect the implementation of eco-process innovation in SME Malaysian halal hub food industry

#### 1.5 Research Questions of Study

This study is attempting to investigate the driver that affect the eco-process innovation in Malaysian halal food industry. In achieving the above objectives, this research addresses the following questions:

- I. What are the level of regulation pressure, normative pressure, competitive pressure and eco-process innovation practices in SME Malaysian halal hub food industry?
- II. What is the driver of eco-process innovation practices in SME Malaysian halal hub food industry?
- III. What are the most of the influential factors that affect the implementation of eco-process innovation in SME Malaysian halal hub food industry?

## 1.6 Scope Of Study

This study is limited to identifying those variables for the driver eco-process innovation that surveys in SME Malaysia Halal food industry. These only include the external factors that influence to implementation eco process innovation practice success. This study fundamentally intends to determine the implementation practice of drivers eco-process innovation which affect the sustainable development among the SME Malaysian halal hub food company. Accurately, the result of this study can demonstrate the practices in Malaysian halal food companies that influence the factors that support successful sustainability development through eco-process innovation.

This research will conduct through Malaysia Halal Hub that focuses which is in Melaka Halal Hub and Pendas Halal Park. In addition, this study will conduct using the Quantitative method to measure the implementation practice eco-process innovation activities among Malaysia Halal food Small-Medium Enterprise (SMEs) company. This method would help policy makers and industries understanding tendencies. Thus, it would also raise knowledge of eco-process innovation among entrepreneur Small-Medium Enterprise and make development attained sustainability development from side eco-process innovation further understanding. The notions of this paper are based on the external factor such as environment regulation, normative pressure, competitive pressure. The external factors would provide a more comprehensive interpretation of reasons to implement eco-process innovation.

## 1.7 Significant Of Study

This research is to identify the factor that lead the success of implementation practice eco-process innovation among the population of Malaysian halal food firms. For the researcher, from the previous studies identified eco-innovation have many factors that influence the success and failure of eco-innovation and many researchers try to group or categorize the drivers. The finding of the study also gives a strong support for the validity and reliability of drivers in eco-process innovation. Positively from identification of the driver's eco-process innovation help in enriched considerate of how to develop more actual factors that will finally indication the companies to