

**A Strategic Approach to the Environmentally Sustainable Business:
The Essence of the Dissertation**

by

Hiroshi Fukushi

ISBN: 1-58112-313-2

DISSERTATION.COM



Boca Raton, Florida
USA • 2006

*A Strategic Approach to the Environmentally Sustainable Business:
The Essence of the Dissertation*

Copyright © 2006 Hiroshi Fukushi
All rights reserved.

Dissertation.com
Boca Raton, Florida
USA • 2006

ISBN: 1-58112-313-2

Dedicated to everyone who would like to maintain a good environment for the generations to come.

TABLE OF CONTENTS

	p
LIST OF ILLUSTRATIONS	vi
LIST OF TABLES	ix
PREFACE	x
ACKNOWLEDGEMENTS	xiii
LIST OF ABBREVIATIONS	xiv
ABSTRACT	xvi
CHAPTER ONE - THE ENVIRONMENTAL PROBLEMS -	1
1 THE ENVIRONMENTAL PROBLEMS	2
1-1 What are the Environmental Problems?	2
1-2 History of the Environmental Problems	2
1-3 Major Elements in the Environmental Problems	3
1-4 Summary of the Environmental Problems	15
2 THE ENVIRONMENTALLY SUSTAINABLE BUSINESS	16
2-1 Change of the Business Strategy	17

2-2	History of Sustainable Development	19
2-3	Environmentally Sustainable Business as the Core Strategy of Companies for 21 st Century	20
3	OTHER CONSTRAINTS TO ENVIRONMENTALLY SUSTAINABLE BUSINESS	22
3-1	Free Trade and Fairness of the Competition	22
3-2	Innovation and the Environmentally Sustainable Business	24
4	SUMMARY	25
	REFERENCES	26
	ENDNOTES	27
CHAPTER TWO	- ENVIRONMENTAL STAKEHOLDERS -	29
1	THE ENVIRONMENTAL PROBLEMS AND STAKEHOLDERS	30
1-1	The Environment and the Economics	31
1-2	Government as a Stakeholder	33
1-3	Individual Company's Initiatives	35
1-4	Consumers	36
1-5	Neighbors	38
1-6	Environmental Protectionists , NGOs	39

2 COMMUNICATION WITH STAKEHOLDERS	43
2-1 History of the Environment Reporting	44
2-2 Environmental Reporting and Companies	45
2-3 Standardization	46
2-4 How Effective the Environmental Report Can Be	47
2-5 Credibility of the Environmental Report	52
2-6 How to Answer Stakeholders' Questions Effectively	53
3 SUMMARY	55
REFERENCES	57
ENDNOTES	58
CHAPTER THREE - BUSINESS STRATEGY -	60
1 TODAY'S BUSINESS STRATEGY	61
1-1 What People Want to Have and What Has Been Sacrificed	61
1-2 What Does the Marketing Concept Hold?	63
1-3 What Kind of New Marketing and Business Strategies Should Be Developed?	64
2 NEW CHALLENGES AND NEW PARADIGM	68
3 CHALLENGES OF "GREENING INNOVATION" AND "GREENING BASE EXPANSION"	71

3-1	Marketing and Business Strategies for "Greening Innovation" in the Money Economy	72
3-2	Challenges to "Greening Base Expansion"	83
3-3	Strategies of "Greening Base Expansion"	87
3-4	Frameworks to Find Sources of "Greening Base Expansion"	89
3-5	Combined Matrices for "Beyond Greening"	92
4	SUMMARY	94
	REFERENCES	97
	ENDNOTES	98
CHAPTER FOUR	-EXPONENTIAL SUCCESS FOR	
	ENVIRONMENTALLY SUSTAINABLE BUSINESS-	100
1	WHAT COMPANIES CAN DO FOR THE ENVIRONMENT	101
1-1	Review of the Global Cooperation of Governments	101
1-2	Excellent Companies Can Change the World	104
2	REACHING TPNR (The Point of No Return) IN THE	105
	GLOBAL WARMING PROBLEM	
3	BUILDING A CONCEPTUAL FRAMEWORK FOR EXPONENTIAL	107
	SUCCESS IN THE ENVIRONMENTALLY SUSTAINABLE BUSINESS	
3-1	Look at the Problem of CO ₂ Emission from a Wider Perspective	108

3-2	The Environmental Value	114
3-3	Conceptual Framework	119
3-4	Completing the Cycle by Connecting Supply and Value for Much Higher Efficiency	128
4	RECENT LEADERS IN THE FIELDS	133
5	SUMMARY	134
	REFERENCES	136
	ENDNOTES	136
	GLOSSARY	140

LIST OF ILLUSTRATIONS

Figure

- 1-1 Temperature Change Estimation by IPCC** Source: IPCC Third Assessment Report (2001).
- 1-2 Damage of Storms** Source: Munich Re, June 1993, “Winds of Change”, in Takashi Sugiyama (1998), *Business Rule Will Be Changed by the Environmental Problems, (Kankyomondai ga bijinesu ru-ru wo kaeru; Japanese)*, (Japan: Ohmsya).
- 2-1 Mechanisms of Economics and Environmental Diseconomy**
- 2-2 A Behavioral Model of the Environmental Stakeholders** Source: “A Guideline for the Environmental Report”, 2001, the Ministry of Environment Japan, in *The Ideal Environmental Report*, by Hidehiko Horikoshi [Online], Available; <http://www2.tokai.or.jp/shida/FarmAssist/bokasi/bokasi.htm>, [Accessed on 13th, April, 2005].
- 3-1 The Long and Winding Road** Source: Stuart L. Hart (2005), *Capitalism at the Crossroads*, (NJ, the USA: Wharton School Publishing), p16.
- 3-2 Four Distinctive Marketing and Business Strategies in the Environmentally Sustainable Business**
- 3-3 The Process of the Market Development** Source: Arthur D. Little (1997), *Growth Strategy in Environmental Business, (Kankyou bijinesu no seichou senryaku)*, (Japan: Diamond Shya). (The original Japanese explanations have been translated to English by Hiroshi Fukushi).
- 3-4 The Strategy Matrix for Greening Innovation in the Money Economy**

- 3-5 The Strategy Matrix of Greening Innovation
Examples of Packaging Problem**
- 3-6 Example of Successful Companies in the Strategy Matrix for Greening
Innovation**
- 3-7 The Global Pyramid** Source: Adapted from C.K. Prahalad and S. Hart (with
assistant from Ted London) (2002), "The Fortune at the Bottom of the
Pyramid." *Strategy +Business*, 26(2002): pp 54-67, in Stuart L. Hart (2005),
Capitalism at the Crossroads, (NJ, the USA: Wharton School Publishing),
p111.
- 3-8 The Strategy Matrix for Greening Base Expansion in the Traditional
Market**
- 3-9 The Strategy Matrix of Greening Base Expansion
Examples of Successful Companies**
- 3-10 The Combined Strategy Matrix for Going Beyond Greening in the
Money Economy and the Traditional Economy**
- 4-1 The PNR (Point of No Return) of the World Population**
- 4-2 The ES (Energy Supply) Chain**
- 4-3 The ES Chain - Case of Coal-**
- 4-4 The Comparison of the LCCO₂ Between the Electricity Generation
Systems** Source: Ryuji Matsushashi & Hisashi Ishii (2001), "A Research on
the Strategy of Wider Usage of Solar Generation Systems Considering the
Manufacturing of the Equipment", *The Journal of the Institute of Electro
Engineers of Japan*, vol. 121-B7, pp 906-999.
- 4-5 The ESV (Energy Supply and Value) Chain**
- 4-6 The Purification Capacity of Oil and the Demand**

- 4-7 The Relationship Between Total Efficiency Improvement and Efficiency Increase in Each of the Eight Steps in the ESV Chain**
- 4-8 The Comparison Between Regular Process and APC (All Product Concept) Process**
- 4-9 Process A and Process B (Example)**
- 4-10 Redesigned Plant Using APC (All Product Concept)**
- 4-11 The ESV (Energy Supply and Value) Cycle**
- 4-12 The ESV (Energy Supply and Value) Chain of a Food Company**
- 4-13 The ESV Cycle of a Food Company**

LIST OF TABLES

Table

2-1 Survey Results of the Targeted Stakeholders of the Environmental

Report Source: Katsuhiko Kokubu, Kenjiro Hirayama, Masaji Kitamura, Yasuhiro Kanda, Eriko Yamanashi and Yasuhide Nakagami (2004), *Corporate Environmental Reporting in Japan (Nihonkigyō no kankyō hōkoku; Japanese)*, (Japan: Hirakawa Kōgyō press), p13.

2-2 Companies' Reasons for Issuing the Environmental Report

Source: *Ibid*, p15.

2-3 A Guideline for Writing Environmental Reports Valuing the Needs of Stakeholders

Source: Ministry of Economy, Trade and Industry Japan.

3-1 Old and New Paradigm

Source: F. Wasik (1997), *Green Marketing*, (the USA: Blackwell Publishers Inc), p6.

3-2 Comparison of Paradigms of Typical Companies in the Money Economy and the Ideal Paradigm to be Indigenous in BOP

4-1 Review of the Global Cooperation of Governments

4-2 Recent Commitment of CO₂ Emission of MNCs in the USA

PREFACE

This book is the essence version of my Ph.D. dissertation submitted to the faculty of graduate studies of Rushmore University, which covers the part one of the dissertation; the development of strategies to the environmentally sustainable business. It precisely explains how to set up strategies for environmentally sustainable business. The part two of the original dissertation; the application of the developed theory to a model company; FD Green Co., Ltd., Thailand, will also be published soon as a business book titled; WE WILL MAKE THE WORLD GREEN. Please note that I am going to use a lot of “I” and “active voice” to write my dissertation, because many journals and business organizations have started to recommend the use of “I” and “active voice”. As a matter of fact, recent word processors have an editing function to check for and caution against passive voice. Before getting into the subject of my dissertation, I explain how I became involved in the area of environmental management. I have a master’s degree from Hokkaido University (Japan, 1984) in environmental engineering (which is included in Chemical Engineering) for research on seawater-activated sludge. Approximately twenty years have passed since that time. I have been working in the area of manufacturing for a Japanese company called Ajinomoto Corporation. Twenty years ago, the Japanese economy was still at its peak and there was not much economic or environmental pessimism. I was working energetically in Ajinomoto’s laboratory, trying to establish the most economical production technology. I did not pay much attention to the environmental problems, especially to the global environmental problems. Today, however, the world situation is totally different from the old days. The world is debating, struggling and trying to figure out the most effective way to reconcile economic development and environmental

preservation. Now I have to take care of both the economy and the environment. The time has passed when a person could be deemed too young to consider complicated aspects of human society. We must all consider, or at least try to consider, one of the most wanted but the most difficult items on the 21st century agenda; reconciliation of economic and environmental needs. The world is debating the significance of the environmental problems and their countermeasures. Some people even say that there is no environmental problem. One of the most shocking incidents happened to my doctoral work; one business journal (I withhold the name of the journal here) rejected my submitted article because its publishers believed that there were business people who deny the existence of the environmental problems. “Don’t be a liar ”, I know there are other extremes; there are people who say that we should even sacrifice economic activity, otherwise mankind will become extinct. The Kyoto protocol was idealistic in trying to gain world cooperation to reduce the emission of CO₂ while the USA, king of capitalism, reacted negatively to the proposal. Many countries hold positions somewhere along the spectrum between the positive and negative extremes. Unfortunately, I don’t think we have enough time to judge by observing the result of the political competition over the Kyoto protocol. We need to act now to preserve the livable environment. This is why and how I began to show my concerns for the environmental problems and became interested in developing effective countermeasures to achieve business development without sacrificing the environment; the result is an environmentally sustainable business. My dissertation is for all those who are in the midst of similar struggles, trying to find realistic ways of developing business in an environmentally sustainable way. I have tried to be as realistic and precise as I can, and tried to stay away from

arguing theories which can be used only in business offices. I tried to find general business rules which can be applied to minimize the environmental burden and be environmentally sustainable in regular business processes. Fortunately, I have learned from Professor Donald Mitchell who wrote “The 2,000 Percent Solution” and “Ultimate Competitive Advantage”, both of which I can use to build the theoretical platform for environmentally sustainable business strategies. Back to twenty years ago once again, when the USA, European countries and Japan were leading the world, the economic and the environmental systems of the world looked much simpler compared to today. However, the situation is much different today. Newspapers today are crowded with the news of newcomers. China, India, Brazil, Russia, Iraq, Indonesia, etc. seldom appeared in newspaper columns twenty years ago, but now dominate the economic and environmental columns, which have expanded. My concern at the spread of environmental problems to these countries forced me to search for and propose effective strategies for environmentally sustainable business worldwide; not only in the money economy but also in the traditional economy (Hart 2005). I am the president of FD Green Co., Ltd., Thailand, which is a subsidiary company of Ajinomoto Thailand Co., Ltd. The business is related to the environmental management of the amino acid fermentation industry and is also an integral part of the waste management of the local industries. I tried to use FD Green Co., Ltd. as a practical and living example to test and validate the effectiveness of my strategy. Fortunately FD Green’s performance in the four years since the birth of the company has been excellent. I hope that my intention for this work is very clear to readers by now and my dissertation is written well enough to encourage readers to try to apply the proposed strategies to their business.

ACKNOWLEDGEMENTS

English is my second language; the entire doctoral work could not have been accomplished without the very kind and dedicated editing work of Ms. Laurel Barley of Rushmore University, who is always precise, effective and merciful. Professor Donald Mitchell of Rushmore University has given me a very clear initiation and directions and detailed instructions for my Ph.D. program, which fits me without even a tiny bit of a deviation. His ability, personality, friendliness, enthusiasm for education made me always try to do something extra, something newer and better. The really powerful business books, “The 2,000 Percent Solution” and “The Ultimate Competitive Advantage” which he co-authored gave me very important hints and insights to formulate my researches on environmentally sustainable business. The Sands family, Ms. Barbara Sands, my American mother; Ms. Barbara Sands, my American English teacher; Dr. Debby Sands; Dr. Dawn Sands, Mr. Daniel Sands, Mr. David Sands, and the late Mr. Lavern Sands, my American father, gave me a truly heartwarming welcome in their home town Eau Claire Wisconsin, the USA. I owe a lot to my American friends in North Carolina; Mr. Lynn Hight, Mr. Mike Lish, Mr. Sanford Perry, Mr. Randy Sullivan and J.B. Braxiston and all the others with whom I worked. I thank Mr. Kanji Mimoto, president of Ajinomoto Thailand, Mr. Keisuke Nagai, vice president, Mr. Tsuyoshi Osumi, former vice president of Ajinomoto Thailand for giving me such great advices to manage technological, environmental and business issues at Ajinomoto Thailand and FD Green Co., Ltd. Last, but not least I thank my wife Naoko and son Raku, who came to Thailand with me and supported my work and study even at their hardest time.

LIST OF ABBREVIATIONS

AJT; Ajinomoto Thailand Co., Ltd.
APC; All Product Concept
APPC; Asian Pacific Potash Corporation
FDG; FD Green Co., Ltd., Thailand
BCAA; Branched Chain Amino Acids
BOD; Biological Oxygen Demand
BOP; Base Of Pyramid
BRICs; Brazil, Russia, India, and China
CERCLA; Comprehensive Environmental Response, Compensation, and Liability Act
CITES; Convention on International Trade in Endangered Species
CP; Cleaner Production
CSR; Corporate Social Responsibility
DfE; Design for the Environment
EU; European Union
ED; Environmental Defense
EDF; Environmental Defense Fund
G8; Group of 8
G20; Group of 20
GPN; Green Purchasing Network
GRI; Global Reporting Initiative
IMF; International Monetary Fund
IPCC; Intergovernmental Panel on Climate Change
LCA; Life Cycle Assessment
LNG; Liquefied Natural Gas
LPG; Liquefied Petroleum Gas
LCCO₂; Life Cycle CO₂
LRTAP; Long-range Trans boundary Air Pollution
MAI; the draft Multilateral Agreement on Investment
MC; Marginal Cost
MNCs; Multi National Companies
MSG; Mono Sodium Glutamate

NAFTA; North **A**merica **F**ree **T**rade **A**greement
NFC; Thai **N**ational **F**ertilizer **C**ompany
NGO; **N**on **G**overnment **O**rganization
OECD; **O**rganization for **E**conomic **C**o-operation and **D**evelopment
PCB; (**P**oly **C**hlorinated **B**iphenyl)
PCD; **P**ollution **C**ontrol **D**epartment
PES; **P**oint of **E**xponential **S**uccess
PFC; **P**erfluoro **C**arbon
RDF; **R**efuse **D**erived **F**uel
RFF; **R**esources **F**or the **F**uture
PNR; **P**oint of **N**o **R**eturn
RCRA; **R**esource **C**onservation and **R**ecovery **A**ct
PRTR; **P**ollutant **R**elease and **T**ransfer **R**egister
SC; **S**ocial **C**ost
SMC; **S**ocial **M**arginal **C**ost
SWOT; **S**trength **W**eakness **O**pportunity and **T**hreat
EPA; **E**nvironment **P**rotect **A**gency
ES Chain; **E**nergy **S**upply Chain
EV Chain; **E**nergy **V**alue Chain
ESV Chain, Cycle; **E**nergy **S**upply and **V**alue Chain, Cycle
UN; **U**nited **N**ations
UNCD; **U**nited **N**ations **C**onference on **D**esertification
UNEP; **U**nited **N**ations **E**nvironment **P**rogram
UNFCCC; **U**nited **N**ations **F**ramework **C**onvention on **C**limate **C**hange
WCED; **W**orld **C**ommission on **E**nvironmental and **D**evelopment
WWF; **W**orld **W**ildlife **F**und
WRI; **W**orld **R**esources **I**nstitute

ABSTRACT

Industrialization brought people both a very comfortable lifestyle and environmental disasters. To preserve a livable environment for successive generations, we have to redesign the whole production system of the world. Environmental protection and sustainable development have to be reconciled and such a business scheme can be called an environmentally sustainable business. Companies should place environmental sustainability at the center of their business strategies because the importance of environmental sustainability to the human race is second to none now. Innovation in environmentally sustainable business will be the key to success in the 21st century. In my doctoral research, I have tried to provide practical, useful strategies for companies to grow as environmentally sustainable businesses. Before the 1980s, companies' attitude to environmental protection was rather reactive. In the 1980s, so called "greening" became a major trend to proactively prevent environmental pollution and incrementally reduce the environmental burden. Since the 1990s the newest paradigm shift has been taking place. Hart (2005) calls this movement "Going Beyond Greening", which claims the necessity of radical transformation of the structure of industries to achieve development in an environmentally sustainable way. "Going Beyond Greening" requires companies to act as innovators in products and services in any regions of the world in which they operate. This is the point where I concentrated my efforts to create useful and practical strategies for environmentally sustainable business. I propose a matrix to divide the global market into four domains, using (the money market/the traditional market) and (incremental technological progress/ innovative technological progress). Two

regions of the matrix appear to be important to companies' success in contributing to society as environmentally sustainable businesses. These are "Green Innovation"; to use innovative technological progress in the money market, and "Greening Base Expansion"; to use innovative technological progress in the traditional market. In the money market where the infrastructure is already sufficient and the competition is very hard, knowing how to retain customers is very important to the success of the environmentally sustainable business. I found two factors that are important for differentiation and customer loyalty; technological innovation in products and services and the innovative system building. In the traditional market where the infrastructure is inadequate and the money economy is not well developed, companies must see eye to eye with indigenous people to fully understand their true needs. Companies are required to transform their paradigm from "foreigner" in the money economy to "indigenous" in the traditional economy. This requires changes in companies' internal system; the values, culture and attitudes, along with technological innovation in products and services. I propose two strategy matrices of the environmentally sustainable business; one for the money economy and the other for the traditional economy. The matrix for the money economy has two factors; "Greening Products and Services Innovation" and "Greening System Building". The matrix for the traditional economy also has two factors "Greening Products and Services Innovation" and "Greening Paradigm Innovation". These two matrices can be combined into one symmetrical matrix. Both of the matrices consist of nine grids, which show pathways of continuing business model innovation. Mitchell, Coles and Metz (1999) have found continuing business model innovation to be the golden rule of the successful business. My matrix for the environmentally sustainable business can be used as the strategic

map to plot how to do continuing business model innovation in an environmentally sustainable business. I have developed a conceptual framework to drastically reduce the environmental burden from industries by “The Energy Supply and Value Cycle” and “All Product Concept”, by focusing on the energy and material flow of the entire business process, which will enable companies to raise the energy efficiency of their business process. I have chosen to apply my strategy and conceptual framework in my company FD Green Co., Ltd., Thailand, and I will show how the company has grown exponentially in a book titled; WE WILL MAKE THE WORLD GREEN, which is scheduled to be published in August, 2006.

CHAPTER ONE

THE ENVIRONMENTAL PROBLEMS

The greatest obstacle to discovery is not ignorance - it is the illusion of knowledge.

- Daniel J. Boorstin -

We are facing serious environmental problems today. This chapter identifies both the kinds of environmental problems but also their magnitude and explains the importance of environmentally sustainable development. "The environmentally sustainable business" is the way to reconcile development of business and the environment. The strategic importance of the environmentally sustainable business in the 21st century is explained by referring to history and recent trends in a global movement to sustainable development.

1 THE ENVIRONMENTAL PROBLEMS

1-1 What are the Environmental Problems?

To most people, the environment includes the natural environment, social environment and cultural environment. Without a proper environment, mankind could become extinct. In this sense, the environmental problems are parts of an even bigger problem; the possible extinction of the human species (Nagasawa 2004).

1-2 History of the Environmental Problems

To most people continued to expand their population and dominated the earth by carrying out continual technical revolutions such as the invention of tools, the agricultural revolution and the industrial revolution. Environmental problems, such as receding forests and advancing deserts, occurred as early as the era of the agricultural revolution. Although the problem was negligible at that stage, there was a dramatic change to the magnitude of the environmental problems at the time of the industrial revolution in the 18th century. In the 1970s, air pollution such as photochemical smog became a significant environmental problem in the major cities of developed countries. Improvements to car exhaust systems also improved the air quality of large cities in developed countries; however in large cities in developing countries, such as Shanghai and Mexico City, the problem is still continuing or deteriorating. In the 1980s, the surprising fact that carbon dioxide (CO₂) and chlorofluorocarbon (CFC) gas have bad effects and cause global warming came as a shock to the general public. Problems related to global warming, acid rain and desertification have been pointed out from the early 1970s.

In 1974, Dr. F. Poland and Dr. M. Morena released a paper to Nature arguing the possibility that CFC was destroying the ozone layer¹. The life of CFC in the atmosphere is estimated to be approximately 50 to 120 years so the destruction of the ozone layer will continue for at least another 50 years, unfortunately.

1-3 Major Elements in the Environmental Problems

1-3-1 Population explosion

The source of the environmental problems is obviously the expansion of the human population, because it is the multiplication factor to every environmental problem. The world population is 6.4 billion now² and it is increasing exponentially. The history of mankind's population expansion is shown below (Sugiyama 1998).

4-5 million years ago	-----	Birth of the human race
6-7 thousand years ago	-----	Below 10 million
A.D. 0	-----	200 million
A.D. 1500	-----	400 -500 million
A.D. 1800	-----	1 billion
A.D. 1900	-----	1.6 billion
A.D. 1994	-----	5.7 billion
A.D. 2004	-----	6.4 billion

The human population has quadrupled since A.D. 1900. In 2010, it will become 7 billion and it will become 8 billion before 2030³. The population increase in developing countries is very rapid. In China, the population in 2004 was 1.3 billion² and, despite birth control, the population is increasing by about 15 million per year.