

Economic Instruments to Combat Climate Change in Asian Countries

**Energy and Environmental Law & Policy Series Supranational and
Comparative Aspects**

VOLUME 29

Editor

Kurt Deketelaere

Professor of Law, University of Leuven, Belgium,

Honorary Chief of Staff, Flemish Government

Honorary Professor of Law, University of Dundee, UK

Secretary – General, League of European Research Universities (LERU), Belgium

Editorial Board

Dr Philip Andrews-Speed, Associate Fellow, Chatham House

Professor Michael Faure, University of Maastricht

Professor Günther Handl, Tulane University, New Orleans

Professor Andres Nollkaemper, University of Amsterdam

Professor Oran Young, University of California

The aim of the Editor and the Editorial Board of this series is to publish works of excellent quality that focus on the study of energy and environmental law and policy.

Through this series the Editor and Editorial Board hope:

- to contribute to the improvement of the quality of energy/environmental law and policy in general and environmental quality and energy efficiency in particular;
- to increase the access to environmental and energy information for students, academics, non-governmental organizations, government institutions, and business;
- to facilitate cooperation between academic and non-academic communities in the field of energy and environmental law and policy throughout the world.

Economic Instruments to Combat Climate Change in Asian Countries

Edited by

Ken'ichi Matsumoto
Anton Ming-Zhi Gao



Wolters Kluwer
Law & Business

Published by:
Kluwer Law International
PO Box 316
2400 AH Alphen aan den Rijn
The Netherlands
Website: www.kluwerlaw.com

Sold and distributed in North, Central and South America by:
Aspen Publishers, Inc.
7201 McKinney Circle
Frederick, MD 21704
United States of America
Email: customer.service@aspenpublishers.com

Sold and distributed in all other countries by:
Turpin Distribution Services Ltd
Stratton Business Park
Pegasus Drive, Biggleswade
Bedfordshire SG18 8TQ
United Kingdom
Email: kluwerlaw@turpin-distribution.com

Printed on acid-free paper.

ISBN 978-90-411-5408-8

© 2015 Kluwer Law International BV, The Netherlands

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission from the publisher.

Permission to use this content must be obtained from the copyright owner. Please apply to: Permissions Department, Wolters Kluwer Legal, 76 Ninth Avenue, 7th Floor, New York, NY 10011-5201, USA. Email: permissions@kluwerlaw.com

Printed and Bound by CPI Group (UK) Ltd, Croydon, CR0 4YY.

List of Editors and Contributors

Dr Ken'ichi Matsumoto is an Assistant Professor at the School of Environmental Science, The University of Shiga Prefecture, Japan. He received his Ph.D. in Policy Studies from Kwansei Gakuin University, Japan, in 2007. He specializes in environmental/energy policy and economics.

Dr Anton Ming-Zhi Gao is an Assistant Professor in the Institute of Law for Science and Technology at the National Tsing Hua University, Taiwan. His main activities are in the areas of energy law and policy, European environmental law, renewable energy, feed in tariff, strategic environmental assessment, etc.

Dr Kanako Morita is a researcher at Bureau of International Partnership, Forestry and Forest Products Research Institute, and a Project Assistant Professor at Graduate School of Media and Governance, Keio University, Japan. She received her Ph.D. in Value and Decision Science from Tokyo Institute of Technology, Japan, in 2010. She specializes in environmental policy and governance, including environmental financing.

Sunhee Suk is a policy researcher working for the Institute for Global Environmental Strategies (IGES), Japan, from September 2010. Her research focuses on the topics of climate change policies in Northeast Asia. She is a Ph.D. candidate in Economics at Kyoto University and holds a Master degree in Urban Environmental Engineering from the University of Tokyo.

Dr Haifeng Deng is a full time Associate Professor of Law School, Tsinghua University, China and he holds a Ph.D. from this law school. He is the vice director of the Center for Environmental, Natural Resources & Energy Law of Tsinghua University and the senior research fellow of the CDM Development and Research Center of Tsinghua University. His research is focusing on the environmental law, nature resource law and energy law.

Dr Jeffrey Shih-Jey Chen is a freelance researcher who focuses on the European Union climate change policy/law. He received his Ph.D. in European Studies from Tamkang

University, Taiwan, and undertook post-doctoral research work at the University of Edinburgh and KU Leuven respectively in 2013 and 2014.

Dr Nguyen Tung Lam is a Director of Centre for Information, Consultancy and Training, Institute of Strategy, Policy on Natural Resources and Environment, Ministry of Natural Resources and Environment of Vietnam. He received his Ph.D. in Urban Engineering from the University of Tokyo, Japan, in 2006. He is interested in environmental/sustainable and low carbon development policies.

Martha Maulidia has been working on climate change and climate finance in different organizations including research NGOs, consulting firms and the United Nations for more than ten years. She worked on various climate change mitigation projects in power, palm oil, waste and REDD + . Prior to pursuing her Ph.D., she taught subjects on climate change and environment in a university in Indonesia. Her research interest is the impact of a carbon tax on business competitiveness.

Dr Joni Jupesta was recently appointed as a science advisor at PT Sinar Mas Agro Resources and Technology Tbk (SMART) in Jakarta, Indonesia, and, since 2013, has been a visiting research fellow at United Nations University, Japan. Prior to that, he worked as a postdoctoral fellow at United Nations University soon after finishing his Ph.D. in management science and technology in 2010 from Tohoku University, Japan. He has received several international awards, among others the Green Talent Award from the German Federal Ministry of Education and Research in 2012, the Mitra Award from the APN in 2013, and the Brown International Advanced Research Institute (BIARI) Seed Grant Award from Brown University in 2014.

Dr Robert Smith holds a Ph.D. in Civil Engineering and is currently working on Asian Development Bank funded as an advisor in asset management and institutional strengthening in India and Sri Lanka. He specializes in the fields of infrastructure asset management and financial sustainability of asset management practices.

Nucharee Nuchkoom Smith is a Doctoral student, School of Law, at the University of Western Sydney, Australia specializing in International Trade Law. She holds Masters Degrees from Universities in both Thailand and Australia. She was previously a Legal Officer to the House of Representatives Standing Committee of Foreign Affairs of the Thai Parliament.

Darryl Smith is an independent consultant in the electricity and telecommunications industries in Australia. He holds a degree in Electrical Engineering and has spent twelve years with a state-owned generation company in both field operations and head office functions. He has also assisted a private company in their entrance into the Smart Grid market.

Prof. Aashish Deshpande is the Head of the Department of Management at National Institute of Technical Teacher's Training & Research, India. He holds an MBA and a Ph.D. from Barkatullah University, India. He is a recipient of Eco-Frontier Fellowship (Ministry of the Environment, Japan) at the National Institute for Environmental

Studies, Japan. He has served as the Head of the Department of Management Studies, Maulana Azad National Institute of Technology, India.

Prof. Manmohan Kapshe is an Architect and Urban Planner. He is a Fellow of the Indian Institute of Management, Ahmedabad, India. He has more than twenty years of teaching experience in Architecture, Planning, Energy and Management courses at various levels in different institutes. He is presently working as the Head of the Department of Architecture & Planning at Maulana Azad National Institute of Technology, India.

Summary of Contents

List of Editors and Contributors	v
CHAPTER 1 Using Economic Instruments for Combating Climate Change in Asia <i>Ken'ichi Matsumoto & Anton Ming-Zhi Gao</i>	1
CHAPTER 2 Tax for Climate Change Mitigation in Japan <i>Kanako Morita & Ken'ichi Matsumoto</i>	7
CHAPTER 3 Greenhouse Gases Emissions Trading and Carbon Tax Scheme in the Republic of Korea <i>Sunhee Suk</i>	25
CHAPTER 4 Recent Development of Carbon Emissions Trading Schemes in China <i>Hai Feng Deng</i>	59
CHAPTER 5 Recent Development of an Emissions Trading Scheme and Energy/Carbon Tax in Taiwan <i>Jeffrey Shih-Jey Chen & Anton Ming-Zhi Gao</i>	83
CHAPTER 6 Development of an Emissions Trading Scheme and CDM in Vietnam <i>Nguyen Tung Lam</i>	109

Summary of Contents

CHAPTER 7	
Recent Development of an Emissions Trading Scheme and Carbon Tax in Indonesia	
<i>Martha Maulidia & Joni Jupesta</i>	127
CHAPTER 8	
Recent Development of an Emissions Trading Scheme in Thailand	
<i>Robert Brian Smith, Nucharee Nuchkoom Smith & Darryl Robert Smith</i>	153
CHAPTER 9	
Addressing Climate Change in India: Developing Market Mechanism and Economic Instruments	
<i>Aashish Deshpande & Manmohan Kapshe</i>	173
CHAPTER 10	
Conclusion: The Unusual Pace in Addressing Climate Change in Asia	
<i>Anton Ming-Zhi Gao & Ken'ichi Matsumoto</i>	195
Index	199

Table of Contents

List of Editors and Contributors	v
CHAPTER 1	
Using Economic Instruments for Combating Climate Change in Asia <i>Ken'ichi Matsumoto & Anton Ming-Zhi Gao</i>	1
§1.01 Climate Change and Asia	1
§1.02 Approaches to Addressing the Issue of Climate Change	2
§1.03 Focus of This Book	3
CHAPTER 2	
Tax for Climate Change Mitigation in Japan <i>Kanako Morita & Ken'ichi Matsumoto</i>	7
§2.01 Introduction	7
§2.02 Climate Change Policies and Economic Instruments for Climate Change Mitigation in Japan	8
[A] Emissions Trading in Japan	10
[B] Feed-in Tariff in Japan	11
§2.03 Detailed Design of Tax for Climate Change Mitigation	11
[A] History of the Discussion of Climate Change Tax	11
[B] Outline of the Climate Change Tax implemented in 2012	15
[1] Petroleum and Coal Tax: Before the Introduction of the Climate Change Tax	15
[2] Imposition of the Climate Change Tax	16
[a] Tax Target and Tax Rate	16
[b] Gradual Tax Enforcement	17
[C] Use of Tax Revenue	18
[D] Efforts to Reduce Economic Burden	19
[E] Border Tax Adjustment	20

Table of Contents

§2.04	Effects of Climate Change Tax	21
	[A] Effects of Climate Change Mitigation	21
	[B] Political and Social Effects	21
§2.05	Challenges and Improvement of the Climate Change Tax	23
	[A] Economic Challenges in Climate Change Mitigation	23
	[B] Political and Social Challenges	23
	[C] Improvements	24
§2.06	Conclusion	24

CHAPTER 3

Greenhouse Gases Emissions Trading and Carbon Tax Scheme in the Republic of Korea

Sunhee Suk 25

§3.01	Introduction	25
§3.02	Overview of Climate Laws and Policies Related to ETS in Korea	27
	[A] Progress in Green Growth Policies and GHG Mitigation Targets	27
	[B] Climate Change Policies under Implementation	30
	[1] GHG and Energy Target Management Scheme (TMS)	30
	[2] Korea Voluntary Emission Reduction Programme (KVER)	32
	[3] Clean Development Mechanism (CDM)	33
	[4] Carbon Neutral Programme	33
§3.03	The Emission Trading Scheme in Korea	34
	[A] Historical Changes in ETS Proposals	34
	[B] Preparations for ETS Introduction	36
	[C] Predicted Policy Effects of ETS	38
	[D] ETS in Detail	39
	[1] Cap Method, Scope, and Coverage	39
	[2] Institutions and Procedures to Operate the Scheme	40
	[3] Method and Rules of Emission Allowances Allocation	42
	[4] Flexibility Mechanism and Penalties	45
§3.04	Deliberations on Carbon Tax Policy in Korea	45
	[A] Current Energy Taxation System	45
	[B] History of and Deliberations on Carbon Tax Policy	46
	[C] Carbon Tax on Vehicles	53
§3.05	Challenges and Suggestions for the Implementation of ETS in Korea	53
§3.06	Conclusions	56

CHAPTER 4

Recent Development of Carbon Emissions Trading Schemes in China

Hai Feng Deng 59

§4.01	Introduction	59
§4.02	Legal Framework of Emissions Trading System	61

	[A] The Legal Basis for ETS Pilots	61
	[B] Relevant International Treaties, Agreements, and Declarations	63
§4.03	The Design of Emissions Trading Scheme	64
	[A] Institutional Design	64
	[B] Method	64
	[C] Target	65
	[D] Covered Industries and Trading Participants	65
§4.04	Rules of Emission Permits Allocation	69
§4.05	Trading Products	72
§4.06	Penalties	73
§4.07	Status Quo of ETS in Seven Pilots	74
	[A] Beijing	75
	[B] Shanghai	75
	[C] Tianjin	76
	[D] Guangdong	76
	[E] Hubei	78
	[F] Shenzhen	78
	[G] Chongqing	78
§4.08	Challenge and Improvement	79
	[A] The Cap	79
	[B] Covered Industries	80
	[C] Method of Allocation	81
§4.09	Conclusion	82
CHAPTER 5		
Recent Development of an Emissions Trading Scheme and Energy/Carbon Tax in Taiwan		
	<i>Jeffrey Shih-Jey Chen & Anton Ming-Zhi Gao</i>	83
§5.01	Introduction	83
§5.02	The Design of Emissions Trading Scheme	86
	[A] Creation of Trading Market	86
	[B] Method	87
	[C] Target	89
	[D] Participants	90
	[E] Rule of Emission Permits Allocation	90
	[F] Rule of Trading	92
	[G] International Context	93
§5.03	The Detailed Design of Energy/Carbon Tax	95
	[A] Institutional Design	96
	[B] Target	96
	[1] Time Schedule	96
	[2] Tax Rate and Object of Taxation or Taxed Items	97

Table of Contents

	[3] Type of Gases Covered	98
	[4] Taxable Entities (Upstream or Downstream)	98
	[C] Reduction of Economic Burden: Border Tax Adjustment	98
	[D] Revenue Use	100
	[1] Tax Integration Function: Tax Reform	100
	[2] Economic Growth and Promotion of Environmental Industries	101
	[3] Consumer and Social Warfare	102
	[E] Summary	103
§5.04	The Barriers on Progressing Emissions Trading Scheme and Energy/Carbon Tax	104
	[A] The Barriers on Progressing ETS	104
	[1] Legislative Gridlock	104
	[2] Policy Uncertainty	105
	[3] Excessive Delegation	105
	[4] The Issue of Carbon Price	106
	[B] The Barriers on Progressing Energy Tax: Political Impracticality	106
§5.05	Conclusions	107
CHAPTER 6		
Development of an Emissions Trading Scheme and CDM in Vietnam		
	<i>Nguyen Tung Lam</i>	109
§6.01	Introduction	109
§6.02	Climate Change Response Policies of Vietnam and the Evolution of Emissions Trading Scheme/CDM in These Policies	110
	[A] Vietnam's National Target Program to Respond to Climate Change	110
	[B] The National Strategy on Climate Change	111
	[C] The National Green Growth Strategy	112
	[D] The Project of Greenhouse Gas Emission Management: Management of Carbon Credit Business Activities to the World Market	113
§6.03	Emissions Trading Scheme and CDM in Vietnam	114
	[A] CDM under the Kyoto Protocol	116
	[1] Legal Framework on CDM in Vietnam	116
	[2] The Design of CDM in Vietnam	119
	[3] The Implementation of CDM in Vietnam	120
	[B] Domestic Voluntary Carbon Market	121
	[C] The Main Issues to Be Addressed in Management of ETS/CDM in Vietnam	123
§6.04	Conclusion	124

CHAPTER 7

Recent Development of an Emissions Trading Scheme and Carbon Tax in Indonesia

Martha Maulidia & Joni Jupesta

127

§7.01	Introduction: Indonesia's Ambiguous Policy: Combating Climate Change versus Massive Amount of Subsidies	127
§7.02	Readiness for Market-Based Mechanisms	130
	[A] Institutional Design for Climate Change	131
	[B] Indonesia's Climate Change Policy: Focus on Mitigation	132
	[C] Market Mechanisms under the Kyoto Protocol	133
	[1] Legal Framework on Market-Based Mechanisms	133
	[2] Clean Development Mechanism (CDM)	134
	[3] Market Mechanisms under the Kyoto Protocol	138
	[D] Paving the Way towards Emissions Trading Schemes: Nusantara Carbon Scheme	138
	[1] Institutional Design of Nusantara Carbon Scheme	139
	[2] Method	141
	[3] Schedule (Periods & Phase)	141
	[4] Baseline and Emission Reduction Target	141
	[5] Type of Gases Covered	141
	[6] Participating Sectors	142
	[7] Implementation and Effects	142
	[E] New Market Mechanisms under Development	142
	[F] Carbon Tax Scheme: Sectorial Carbon Taxes as the Foundation of a Broad-Based Carbon Tax	143
§7.03	Challenges and Improvement	146
	[A] Skewed Policy towards Mitigation	146
	[B] Private Sector Participation	147
	[C] Lessons from CDM	147
	[D] Institutional Arrangement	148
	[E] Nusantara Carbon Scheme	148
	[F] Designing a Carbon Tax	149
	[G] Alternative to Carbon Taxes	150
	[H] Where We Are and the Need of a Roadmap	150
§7.04	The Way Forward	151

CHAPTER 8

Recent Development of an Emissions Trading Scheme in Thailand

Robert Brian Smith, Nucharee Nuchkoom Smith & Darryl Robert Smith

153

§8.01	Introduction	153
	[A] Overview	153
	[B] Policy Framework	153

Table of Contents

	[C] The Establishment of National Committee on Climate Change	154
	[D] Thailand's Response to Climate Change	154
	[E] CDM	157
	[F] Role of an Emissions Trading Scheme (ETS) in Thailand's Response	157
	[G] Outline of Article	158
§8.02	Development and Implementation of CDM Projects in Thailand	158
	[A] Legal Framework	159
	[1] CDM Specific Laws	159
	[2] Foreign Business Laws	159
	[3] Electricity Industry Laws	160
	[4] Uncertainty Operating without CDM Specific Taxation Laws	160
	[B] Evaluation Procedure for CDM-Program of Activities (PoAs) in Thailand	161
	[1] Qualifications of the Coordinating/Managing Entity (CME)	161
	[2] Sustainability and Environmental Impact of CDM-PoAs	161
	[C] Crown Standard	162
	[D] The Implementation of CDM: An Overview of CDM Projects	163
§8.03	Design of Proposed ETS	164
	[A] Institutional Design	164
	[1] Current Status	164
	[2] Institutional Design of EPC Scheme	165
	[B] Method	166
	[C] Target	166
	[1] Schedule	166
	[2] Baseline and Emission Reduction Target	166
	[3] Type of Gases Covered	167
	[D] Participants	167
	[E] Rule of Emission Permits Allocation	168
	[1] Allocation Method	168
	[F] Rules of Trading	168
	[G] International Context	169
§8.04	Implementation: The Potential Effects of ETS	169
§8.05	Challenge and Improvement	170
	[A] CDM	170
	[B] Emissions Trading Scheme	171
§8.06	Conclusion	172

CHAPTER 9

Addressing Climate Change in India: Developing Market Mechanism
and Economic Instruments*Aashish Deshpande & Manmohan Kapshe* 173

§9.01 Climate Change and India: An Introduction 173

§9.02 Developing Market Mechanism and Economic Instruments in India 175

[A] Coal Cess and National Clean Energy Fund 176

[1] Development of Clean Energy Cess and NCEF
Institutional Framework 177

[2] NCEF Appraisal, Approval, and Funding Mechanism 179

[3] Target and Utilization 180

[B] Emissions Trading Scheme 181

[1] Developing ETS Mechanism 181

[2] Target and Utilization 183

[C] Energy Saving and Renewable Energy Certificates
Trading System 183

[1] Energy Saving Certificates 184

[a] Development of ESCerts Market Mechanism 184

[b] Target and Utilization 186

[2] Renewable Energy Certificates 186

[a] Development of REC Market Mechanism 186

[b] Target and Utilization 189

§9.03 Challenges and Solutions 190

§9.04 Conclusion 192

CHAPTER 10

Conclusion: The Unusual Pace in Addressing Climate Change in Asia

Anton Ming-Zhi Gao & Ken'ichi Matsumoto 195

Index 199

CHAPTER 3

Greenhouse Gases Emissions Trading and Carbon Tax Scheme in the Republic of Korea

*Sunhee Suk**

§3.01 INTRODUCTION

The Republic of Korea (hereinafter referred as Korea) was the world's seventh largest CO₂ emitter in 2010.¹ Its greenhouse gases (GHGs) emissions have greatly accelerated since 1990 and this upward trend are far more significant than in other OECD countries (OECD: Organisation for Economic Cooperation and Development).² Korea entered the United Nations Framework on Climate Change (UNFCCC) in December 1993 and was classified as a non-Annex I country without GHG reduction obligations under the Kyoto Protocol (2008-2012).³

Major outcomes of the UNFCCC Bali meeting in 2007 include a commitment by developing countries to incorporate mitigation plans, dependent on developed-country actions, in the next global climate agreement.⁴ Further, in December 2011 the parties of the UNFCCC adopted the 'Durban Platform for Enhanced Action', which set the stage for a new round of negotiations for all parties to achieve a future legally-enforceable international agreement to reduce GHG emissions. In response to it, Korea pledged its

* Sunhee Suk, Institute for Global Environmental Strategies, Japan.

1. Olivier, J.G.J., Janssens-Maenhout, G., Muntean, M., & Peters, J.A.H.W., *Trends in Global CO₂ Emissions: 2013 Report*. The Hague, the Netherlands: PBL Netherlands Environmental Assessment Agency (2013).
2. OECD, *Key Environmental Indicators* (2008) (available at: <http://www.oecd.org/dataoecd/20/40/37551205.pdf>).
3. Available at: http://unfccc.int/parties_and_observers/parties/non_annex_i/items/2833.php.
4. MOE, Press: *Bali Roadmap Adopted at the 13th Conference*, 17 December 2007.

own GHG emission reduction targets and has consequently adopted various climate change countermeasures.⁵

In 2008, the Lee Myung-bak Government (2008-2012) declared a national vision of ‘Low Carbon Green Growth’, spearheaded by a nationwide GHG emissions trading scheme (ETS) as a tool to realize the country’s 2020 GHG reduction target. As a preparatory programme for ETS, the ‘GHG and Energy Target Management Scheme (TMS)’,⁶ a mandatory regulation to limit energy consumption and GHG emissions of large energy-consuming entities and business sites, was initiated in 2011. The scheme set out to establish a GHG emissions inventory and management procedures for the monitoring, reporting, and verification (MRV) of GHG emissions, paving the way for full-blown introduction of ETS in Korea. Following on from TMS, the ‘Act on Allocation and Trading of Greenhouse Gas Emission Allowances’⁷ was approved in May 2012, which enables the launch of domestic ETS at the beginning of 2015. Subsequent thereto, on January 2014, the ‘National GHG Emission Reduction Roadmap 2020’ and ‘GHG ETS Basic Plan’ were issued, and Korean Government appointed Korea Exchange (KRX) as the marketplace for trading GHG emissions permits. The allowance allocation plan as a follow-up document was drafted in May 2014 to enable practical ETS operations and clarifies the total amount of GHG emissions permits.

Discussions have also emerged on a carbon tax levied on fossil fuel carbon content. A three-year project ending in 2010 was initiated to explore energy taxation reform for a ‘climate friendly’ financial system with options for carbon tax introduction in Korea, and resulted in two carbon tax proposals being submitted to the National Assembly. However, due to strong resistance from industry and the ETS-based focus of current climate policies, discussions on carbon tax introduction are currently on ice. Government plans drafted in lieu of a carbon tax and designed to directly tax car owners for their CO₂ emissions from January 2015, as well as incentivize the purchase of cleaner cars, also met opposition – from domestic carmakers – and have been postponed until 2021.

In order to clarify carbon pricing policies in Korea, this chapter overviews the country’s energy and climate laws, as well as policies related to carbon pricing, and provides details of scheme design and discussions surrounding ETS and the carbon tax. The rest of the paper is arranged as follows. Section §3.02 below overviews climate change policies related to ETS in Korea. As the core component of this chapter, section §3.03 details the history of ETS proposals and the scheme design as well as related institutions and rules needed to manage and operate the scheme, methods of determining emission allowances and current allocation plans and envisaged policy effects. Section §3.04 chronologically overviews progress in carbon tax policy and the proposals under discussion. Section §3.05 discusses the challenges for implementing ETS in Korea and section §3.06 concludes the paper.

5. Available at: http://unfccc.int/meetings/doha_nov_2012/meeting/6815.php.

6. GHG and Energy Target Management Scheme (TMS), Notification No. 2014-88 of the Ministry of Environment (last amended 30 May 2014) (in Korean).

7. Act on Allocation and Trading of Greenhouse Gas Emission Allowances, Act number of 11690 of 2012 (last amended 23 March 2013) (in Korean).

§3.02 OVERVIEW OF CLIMATE LAWS AND POLICIES RELATED TO ETS IN KOREA

[A] Progress in Green Growth Policies and GHG Mitigation Targets

Whilst the Government of Korea started laying climate change infrastructure through its establishment in 1999 of the ‘Comprehensive Plan on Countermeasures to Climate Change’ (updated three-yearly until 2007), which was designed to build up a statistics management system for GHG emission and support industrial voluntary GHG reduction activities, the plan was a bad fit in terms of optimizing strategies for GHG reduction at the national level and still at the preparatory stage as regards participation in the international carbon market.

Lee’s government (2008-2012) positioned a green growth strategy as a flagship development paradigm and laid the cornerstone for climate change policies of Korea. In August 2008, the ‘National Energy Plan (2008-2030)’ was released, which directly influenced Korea’s energy and climate policies, a field once dominated by voluntary approaches. It firstly depicted a roadmap for energy efficiency policies to be gradually transformed from voluntary agreements (VAs) to negotiated agreements (NAs). Of the NAs, the GHG and Energy TMS and domestic ETS are addressed. Korea proposed a national vision of ‘Low Carbon, Green Growth’,⁸ aimed at redirecting the national development paradigm in pursuit of sustainable growth and reducing GHG emissions and pollution by creating new growth engines in green technology and clean energy.

In September 2008, Lee’s government established the ‘Fourth Comprehensive Plan on Countermeasures to Climate Change (2008-2012)’, which underpinned the national strategy of promoting low carbon green growth. The plan had three goals – the creation of eco-friendly new growth engines, enhancement of quality of life and contribution to international efforts against climate change – and was supported by twelve strategic action plans. As regards climate change, action plans detail the formulation of a legal system and related institutions, energy taxation reform and the introduction of domestic ETS in Korea.

In 2009, Korea pledged a GHG emission reduction target of 30% from the forecast 2020 business as usual (BAU) level, which is the most ambitious level of mitigation recommended by the Intergovernmental Panel on Climate Change (IPCC) for developing countries. To help achieving this GHG mitigation target, the Presidential Commission on Green Growth (PCGG) was established in 2009 and the ‘Framework Act on Low Carbon Green Growth (hereafter referred to as the Framework Act)’⁹ was enacted in 2010, which together provide the legal grounds to introduce carbon pricing policies in Korea. In order to integrate management of GHG inventory and MRV, the Greenhouse

8. The concept of green growth was established at the Fifth Ministerial Conference on Environment and Development held in March 2005 in Seoul. The Ministry of Korea and ESCAP initiated the ‘Seoul Initiative of Green Growth’ and provides a cooperation framework for Green Growth that encompasses the economic, social, cultural, and geographical features in the Asia-Pacific region (available at: <http://www.singg.org/main/index.asp>).

9. Framework Act on Low Carbon Green Growth, Act number of 11965 of 2010 (last amended 30 July 2013) (in Korean).

Gas Inventory & Research Centre (GIR) was established on 15 June 2010. The National Strategy for Green Growth (2009-2050) was adopted along with the Five-Year Plan (2009-2013) for green growth. Under this plan the government spends approximately 2% of annual GDP on green growth programmes and projects.

At the end of 2012, Park Geun-hye from the ruling Saenuri Party was elected as the eighteenth president. President Park advocates a 'Creative economy' vision as a key policy but is a critic of the green growth policy proposed by the previous government. Whilst she has scaled down considerably and demoted the key climate change institute, PCGG, to the Committee on Green Growth¹⁰ – leading to concern of a reduced commitment to tackling climate change – her government is likely to inherit most policies on climate change implemented under the former administration.¹¹ Policy progress in green growth over the two recent administrations is summarized in Table 3.1.

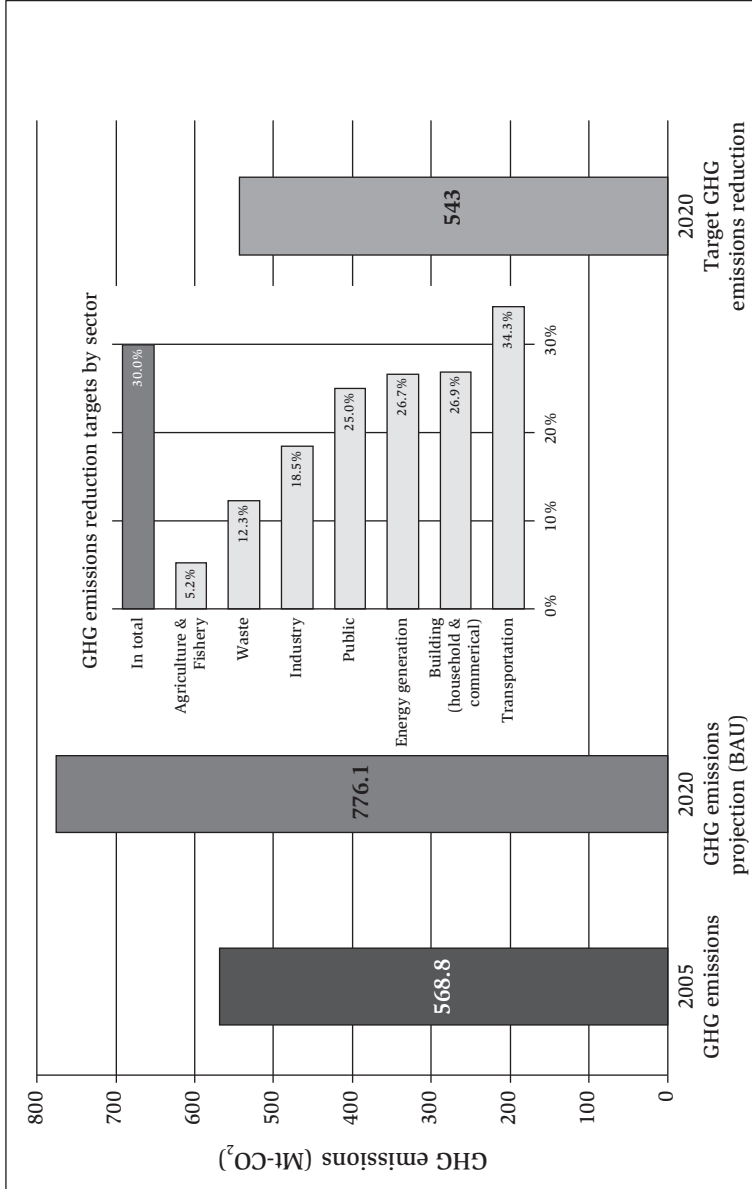
Table 3.1 Progress in Korea's Green Growth Policy

<i>Date</i>		<i>Progress in Green Growth Policy and ETS</i>
1997-2007		Established the 'Comprehensive Plan on Countermeasures to Climate Change' every 3 years
2008	13 August	Established the first National Energy Basic Plan (2008-2030)
	15 August	Announced the National Vision 'Low Carbon Green Growth'
	19 September	Established fourth National Countermeasures on Climate Change
2009	16 February	Established the Presidential Committee on Green Growth
	6 July	Announced the National Strategy for Green Growth and Five-Year Plan
	17 November	Announced the National GHG reduction target of 30% below BAU by 2020
2010	14 April	Enacted the Framework Act on Low Carbon Green Growth
	15 June	Established the Greenhouse Gas Inventory & Research Center
	12 July	Announced the deposited GHG reduction target by sector
2014	14 January	Established the second National Energy Basic Plan (2013-2035)
	28 January	Released the 'National GHG Emission Reduction Roadmap' and the 'ETS-Basic Plan'
	3 June	Established the second National Strategy for Green Growth and Five-Year Plan

10. The Korea herald, *Park Ditches 'Green Growth' in Environmental Policy Shift*, 28 March 2013 (available at: <http://www.koreaherald.com/view.php?ud=20130328000986>).

11. Suk, S., *South Korea: Entering a New Era of Green Growth*. IGES (2013) (available at: <http://www.iges.or.jp/en/news/topic/asianfocus201301.html>).

Figure 3.1 National GHG Emission Reduction Target and the Sectorial Reduction Rate by 2020



In January 2014, the Government of Korea released the ‘National GHG Emission Reduction Roadmap 2020’, which addressed a national emission reduction target and action plans for each sector. The Roadmap involved the Ministry of Environment (MOE) under Park re-estimating the national GHG emission reduction target, but the figure was eventually the same as that originally set by the former administration in 2011. As shown in Figure 3.1, the plan aims at a reduction of 233 Mt-CO₂ by 2020, 30% of the expected 2020 BAU level of 776 Mt-CO₂. Reduction rates by sector are: 18.5% for industry; 26.7% for energy conversion and generation; 26.9% for building; 34.3% for transportation; and 25% for the public sector. For the waste management and agriculture and fishery sectors, the reduction rates were set at 12.3% and 5.2%, respectively. The Roadmap posited ETS as the key measure to realize the target of GHG emission reductions by 2020. The Second National Strategy for Green Growth and Five-Year Plan (2014-2018) placed the focus on achieving substantial emission reductions.¹²

[B] Climate Change Policies under Implementation

Current climate change policies of Korea embrace three different programmes: TMS, voluntary energy saving programme (VA and Carbon Offset Programme) and Korean Voluntary Emission Reduction Programme (KVER).

[1] GHG and Energy Target Management Scheme (TMS)

TMS is a mandatory scheme led by the MOE under the Framework Act and started in 2011 as a precursor to ETS for large energy-consuming entities and business sites mainly in the industry and power sectors. It is designed to cap the energy consumption and GHG emissions of target companies, and initially targeted entities with average emissions over 125,000 t-CO₂ and energy demands over 500 TJ, or business sites with average emissions over 25,000 t-CO₂ and energy demands over 100 TJ, during 2007-2009. As shown in Table 3.2, the criteria for designating target entities and business sites were strengthened every year.¹³

MOE performs overall coordination between ministries and provides the enabling conditions, such as setting standards, drafting guidelines, and managing verification agencies. The related ministries^{14,15} select entities from each sector to be subject to the scheme, set targets based on negotiations with entities, and evaluate their performance. Entities in the scheme are required to measure their GHG emissions, submit their mitigation plans by December of each compliance year, and be verified by March

12. Second National Strategy for Green Growth and Five-Year Plan (in Korean) (2014).

13. Available at: http://www.gir.go.kr/eng/index.do?menuId=10#biz_con1.

14. MOE, Press: *A Blueprint for Reducing GHG Emissions Is Coming – The Status of Policy Implementation of TMS* (in Korean), 29 June 2011.

15. Ministry for Food, Agriculture, Forestry, and Fisheries for 27 entities in agriculture and forestry sectors, Ministry of Knowledge Economy for 374 entities from energy and industrial sector, Ministry of Land, Transport and Maritime Affairs for 46 entities from building and transportation sectors, Ministry of Environment for 21 entities from waste sector.

of the subsequent year.¹⁶ A penalty of KRW 10 million is applied for non-compliance (around USD 9,000).¹⁷ The National Greenhouse Gas Inventory System, managed by GIR, supports tracking of GHG emitted by entities and provides the data required for MRV. The TMS helps prepare the standards corresponding to the international benchmark for GHG emissions management, including the MRV process.

Table 3.2 Criteria for the Designation of TMS Targets

Item	As of 31 December 2011		From 1 January 2012		From 1 January 2014	
	Entities	Business sites	Entities	Business sites	Entities	Business sites
GHG emissions amount (t-CO ₂)	125,000	25,000	87,500	20,000	50,000	15,000
Energy use amount (TJ)	500	100	350	90	200	80

Source: Available at: http://www.gir.go.kr/eng/index.do?menuId=10#biz_con1.

In the first year of the TMS, 471 entities from seven sectors – power, industry, building, transportation, agriculture, livestock, and waste sectors – whose GHG emissions accounted for about 61 % of the national total in 2007, were targeted. The target of GHG emissions for 458 entities¹⁸ was 598 Mt-CO₂, which was reduced by 8.727 Mt-CO₂ (1.44%) from the expected 606 Mt-CO₂. An MOE statement on the results of TMS performance for 2012 showed a reduction of 21.3 Mt-CO₂, exceeding by 2.7 times the initial reduction target. Of the total, 372 entities had achieved a 30 Mt-CO₂ reduction, which can be recognized as early action in the ETS.¹⁹

As listed in Table 3.3, 480 entities participated in TMS in 2013. A total of 590 Mt-CO₂ was estimated to be emitted, of which 572 Mt-CO₂ is permitted at a reduction rate of 3.02%. The reduction rates by sector are set at 3.02% for 32 entities in the power generation sector and 3.00% for 345 entities in the industry sector.²⁰ A total of 560 entities had joined the TMS as of 2014, the estimated emissions of which will be 606 Mt-CO₂, with a target reduction of 1.7 Mt-CO₂ (2.8% in reduction rate). The reduction rate of the industry sector is 1.05%, a decrease compared to 2013, while that for the power generation sector is slightly strengthened, at 4.48%.²¹

16. Available at: http://www.gir.go.kr/eng/index.do?menuId=10#biz_con1.

17. Article 64(1) of the Framework Act of 2010 (in Korean).

18. Thirteen companies were excluded from the target entities due to closures, mergers or insufficient emission reductions based on criteria.

19. MOE, Press: *TMS in 2012 Achieved Exceeded GHG Reduction Targets* (in Korean), 23 January 2014.

20. MOE, Press: *Management of the GHG Emission Growth in 2013 Lower Than GDP Growth* (in Korean), 16 October 2012.

21. MOE, Press: *The Reduction Target of TMS in 2014, 17 Mt-CO₂* (in Korean), 23 October 2013.

Table 3.3 Reduction Targets of TMS in 2013 and 2014 in Korea

		<i>Participants (Entities)</i>	<i>Permitted Emissions (Mt-CO₂)</i>	<i>Projected Emissions (Mt-CO₂)</i>	<i>Reduction Rate (%)</i>
2013*	Total	480	572	590	3.02
	Power generation	32	245	252	3.02
	Industry	345	309	318	3.00
2014**	Total	560	590	606	2.80
	Power generation	37	262	274	4.48
	Industry	389	305	309	1.05

Source: * MOE, *supra* n. 20, ** MOE, *supra* n. 21.

[2] *Korea Voluntary Emission Reduction Programme (KVER)*

The Kyoto Protocol defines three ‘flexibility mechanisms’ that can be used by Annex I Parties in meeting their emission limitation commitments: International Emissions Trading (IET), the Clean Development Mechanism (CDM) and Joint Implementation. IET allows Annex I Parties to ‘trade’ their emissions, which is similar to the carbon market developed in the EU. Korea is not eligible to participate in the IET but has registered several CDM projects and implemented domestic voluntary emission reduction programs to promote a domestic carbon market.

KVER is a project-based GHG emission reduction programme benchmarked from CDM. Its launch in 2005 represented the first implementation of GHG emission reduction registration by a non-Annex I country,²² and acted as the precursor to a national carbon market in Korea. The Ministry of Trade, Industry and Energy (MOTIE) as the accreditation committee approves registrations and certification projects and designates verification entities. The Ministry of Knowledge Economy (MOKE)²³ established the Korea GHG Reduction Registry Centre under the Korea Energy Management Corporation (KEMCO) as a designated authority to issue Korea Certified Emission Reductions (KCER) for KVER participants. Under KVER, 1 KCER represents a successful emission reduction equivalent to one tonne of CO₂ and participants of private and public sectors register their GHG emission reductions by voluntary projects through a validation process involving assessment of emission reductions by a GHG verification entity. These entities request GHG reduction certification from MOTIE, which issues

22. KEMCO, *Korea Voluntary Carbon Credit Initiative for Low Carbon & Green Growth* (presentation material at Climate Thailand Conference) (2010).

23. The MOTIE was formerly the MOKE under Lee’s government (2008-2012).

KCERs to the participants.^{24,25} As of September 2013, over 935 projects had been verified, with a reduction credit totalling 14.6 Mt-CO₂.²⁶

KCERs can be sold on the domestic market by power companies and domestic private companies as well as on the international market after conversion to internationally recognized CERs. Power companies may buy KCERs to satisfy the requisite proportion supplied by renewable energy under the Renewable Portfolio Standards (RPS). Companies under TMS and ETS will achieve recognition of KCER for their early action.²⁷ From 2007 to 2011, KCERs purchased by the Korean Government fetched an average price of USD 5/t-CO₂. Since the introduction of TMS in 2011, large companies and major GHG emitters have been subject to mandatory reductions, which has resulted in a drop in number of KCERs registered. To counter this and stimulate voluntary carbon reductions, Korean Government raised the purchase price to USD 12/t-CO₂ and encourages small- and medium-sized enterprises (SMEs) to actively participate in KVER. As of September 2013, the government had purchased a total of 7.63 Mt-CO₂ of KCER.²⁸

[3] *Clean Development Mechanism (CDM)*

Korea's involvement in CDM started with the registration of the Ulsan Chemical HFC23 Decomposition Project in 2005. As of November 2013, 99 CDM projects had been registered in the UN, among which, from 38 projects 109 million CERs were issued.²⁹ Such CDM credits differ from KCERs credits in that the former cannot be sold by the government. The CERs will be recognized as offset credit under the domestic ETS.

[4] *Carbon Neutral Programme*³⁰

The 'Carbon Neutral Programme' was launched during the third 'Climate Change Countermeasure Week' in 2008 by KEMCO, its creator and operator. The programme is designed for individuals, companies, and local governments to offset their GHG emissions generated in daily life through various voluntary reduction activities. Participants register their intent to participate and then perform actions to reduce GHG emissions, for which reduction certificates are issued upon reporting of results to KEMCO. Offsets to invest in new and renewable energy systems and carbon sink

24. KEMCO, *Project-Based GHG Reduction Programme in South Korea* (presentation material), March 2010.

25. Seven verification bodies have been designated, and qualified verifiers have been appointed up to 237 experts including the industry employees since 2006. Approved verification body is Korean Foundation for Quality, Korea Standard Association, Korea Gas Safety Corporation, DNV Korean, SGS Korea, and GHG Verification Centre.

26. KEMCO, Press: *KVER's Day for National GHG Emission Reduction* (in Korean), 24 October 2013.

27. *Ibid.*

28. Available at: <http://www.kcer.kemco.or.kr/>.

29. MOSF, *GHG ETS Basic Plan* (in Korean), January 2014.

30. Available at: <http://zeroco2.kemco.or.kr/>.

projects at a price of KRW 15,000/t-CO₂ are also options for carbon mitigation.³¹ The programme attracted 33 participants in its initial year, which had increased to 1,893 for 2012. As of 2012, a total of 6,340 had participated in CO₂ mitigation activities, realizing total reductions equivalent to 68,670,393 kg-CO₂ since the programme's outset.³²

§3.03 THE EMISSION TRADING SCHEME IN KOREA

[A] Historical Changes in ETS Proposals

A strategic action plan for forming an institutional framework for a GHG reduction system that incorporates introduction of ETS in promoting a domestic carbon market was built into the Fourth National Countermeasures on Climate Change in 2008. The Framework Act states a legal basis for the introduction of ETS in 2010.³³ Accordingly, a preliminary proposal for Korean ETS was first released in November 2010 by the Cabinet and included the start date, implementation schedule, participation criteria, ratio of free allowance allocations, and penalty rules.³⁴ In detail, it recommended ETS be introduced from 2013 in three phases: the first phase would start in 2013 and end in 2015, followed by two subsequent phases of five years each. Ten percent of the total emission allowances would be allocated by auction and the remaining 90% for free in the initial phase, with the auction proportions increased thereafter. The suggested penalty for non-compliance emissions, i.e. those exceeding allocated amounts, was set at less than five times the average market price of the emission allowance, and capped at KRW 100,000/t-CO₂. A maximum of KRW 50 million could be levied for administrative violations, such as negligence in reporting.

However, the initial proposal omitted several key issues, such as the details of how allowances would be allocated and how the programme would operate alongside existing regulations and policies. Details of specific measures for the scheme's operation, including banking and borrowing of allowances, MRV and trading registry, etc., were also omitted. The proposal was strongly resisted by industry.^{35,36}

In April 2011, a second ETS proposal was released reflecting the opinions voiced by industry, and was submitted to the National Assembly, where the government modified it to increase the ratio for free allowance allocation and push back the start date to 1 January 2015.³⁷ The second proposal calls for the creation of an 'Allocation Committee', led by the Ministry of Strategy and Finance (MOSF), to delineate how allowances would be allocated for each field and deliberate on strategy to maintain market stability. GHG emission reductions and trading are registered and managed by

31. Available at: http://www.kemco.or.kr/new_eng/pg02/pg02020600.asp.

32. *Ibid.*

33. Article 46(1) of the Framework Act of 2010 (in Korean).

34. Prime Minister's Office, *Advance Notice of Proposed Rulemaking on GHG Trading Scheme* (in Korean), November 2010.

35. Financial news, *Industry Association Urged the Delay of ETS* (in Korean), 8 December 2010.

36. Korea Economy, *GHG ETS 'Braked'* (in Korean), 14 January 2011.

37. Prime Minister's Office, *Advance Notice of Proposed Rulemaking on GHG Trading Scheme* (in Korean), 25 February 2011.

the GIR. The bill does not explicitly state the entities to be targeted by ETS, which are instead to be determined based on international trends in climate negotiations and policies. A likely option is to target the largest energy consumers or GHG emitters listed as TMS targets. In addition, 95% allowances may be allocated for free in the primary period. Transfer of emission allowances is allowable between different implementation periods other than the initial period, and emissions exceeding allowances are subject to a penalty of less than three times the average market price. Table 3.4 summarizes the main features of and changes to the first and second proposals, as well as the industry requirements.

Table 3.4 The First and Second ETS Proposals

<i>Item</i>	<i>Preliminary Proposal*</i>	<i>Requirements from Industry**</i>	<i>Second Proposal***</i>
Allocation Committee	Not specified	-	Led by the Minister of Strategy and Finance.
Reflection of production increase/decrease (Articles 5, 9, and 10)	If economic conditions change rapidly, the government will change the allocation plan.	-	If production volumes increase or decrease unexpectedly, the affected company can request changes in its allocation amount.
Target (Sub-industry) (Articles 5 and 7)	All fields under the TMS and companies that emit GHG at a certain level or higher.	-	Basic application targets are maintained, but preparation conditions and international competitiveness should be considered via an allocation plan. Corresponding sub-industries are then decided.
Ratio of free allocation and allocation at cost	(Primary) Free allocation (90% or more) (Secondary) Prescribed in presidential decree (Tertiary) Allocation at cost (100%).	Complete free allocation	(Primary) Free allocation (95% or more) (Secondary or later) After considering international trends and industrial competitiveness, decided by a presidential decree.
Allowance transfer in plan period (Article 14)	Impossible during plan period.	Permissible	Possible during plan period * Note that carry-out from primary to secondary compliance period is prohibited.

<i>Item</i>	<i>Preliminary Proposal*</i>	<i>Requirements from Industry**</i>	<i>Second Proposal***</i>
Support for industry field (Article 28)	Fund can be created with the profits generated from emissions trading.		Comprehensive support for GHG reduction activities, such as tax benefits and subsidies, are secured.
Penalty (Article 31)	5 x average market price per tonne (up to KRW 1 million)	To be alleviated	3 × average market price/tonne (upper limitation removed).
Fine (Article 33)	Below KRW 50 million for administrative obligation violations, such reporting negligence.		Below KRW 10 million.
Third party participation in emissions trading	Necessary.	Impossible	Detailed contents are reviewed in enforcement ordinances (Note that third party participation requires permission basis rule).
Start date of primary plan period (Annex: Article 2)	1 January 2013	2015 or later	1 January 2015

Source: * Prime Minister's Office, *supra* 34, ** Korea economy, *supra* 36, *** Prime Minister's Office, *supra* 37.

After slight revisions to the second proposal, the ETS bill, namely the '*Act on Allocation and Trading of Greenhouse Gases Emission Allowances (ETS Act of 2012)*', was finally approved by parliament in May 2012. Operational responsibility for ETS lies with the MOE. Subsequently, the '*Enforcement Decree of Act on Allocation and Trading of Greenhouse Gas Emission Allowances (Enforcement Decree of ETS Act)*', officially approved on 13 November 2012, clarified how ETS will proceed after the start of 2015 and specified rules of management.

[B] Preparations for ETS Introduction

After the 2015 launch of domestic ETS was approved, follow-up measures were taken promptly. Policy progress in ETS is summarized in Table 3.5.

Table 3.5 Milestones in Progress and Implementation Plan of ETS in Korea

Year	Date	Milestone
2008	19 September	Fourth National Countermeasures on Climate Change established
2010	17 November	Preliminary ETS proposal released
2011	12 April	Second version of ETS proposal submitted to parliament
2012	14 May	'Act on Allocation and Trading of Greenhouse Gas Emission Allowances' approved
	13 November	'Enforcement Decree of ETS Act' ³⁸ clarified
2013	22 February	Task force launched to develop guidelines and allocation method for GIR
	27 May	Joint working group of experts from industry, research institutes, and academia formed for determining emission allowances
2014	14 January	KRX appointed as carbon trading marketplace
	28 January	'National GHG Emission Reduction Roadmap' and 'GHG ETS Basic Plan' established
	27 May	'National GHG Emission Allocation Plan' published
	July	ETS participant notification planned
	October	Allowance allocation for each entity planned
2015	January	Start of ETS

In 2013, MOE launched an intergovernmental task force to design domestic ETS, the main duties of which were to formulate a National Allocation Plan before June 2014, designate a market for emissions trading, and create a transparent scheme that is measurable, reportable and verifiable. The task force plans to create a permanent consultation platform with diverse stakeholders who meet regularly to initiate dialogues on design of the scheme.³⁹

In January 2014, Busan-based stock market operator KRX was appointed as the country's carbon exchange marketplace for the trading of carbon emissions permits from 2015.⁴⁰ KRX will open and operate the market and perform transactions and auctions of emission permits, clearance and payment for emission permits, market monitoring and mediate in disputes over transactions of emission permits. It will adopt systems for carbon emissions trading similar to those used in current stock markets

38. Enforcement Decree of the Act on Allocation and Trading of Greenhouse Gas Emission Allowances, Presidential decree number of 25751 of 2012 (last amended 19 November 2014) (in Korean).

39. Stabilising Climate, World News Article: Korea Government Launches the Design Team for 2015 Emission Trading Scheme, 22 February 2013 (available at: http://lcs-rnet.org/world_news_articles/2013/02/359).

40. MOE, Press: *Designate Korea Exchange Inc. as Emission Permits Exchange* (in Korean), 15 January 2014.

and, together with MOE, will establish a system necessary for transactions, clearance and payment for carbon emission permits as well as market monitoring in the first half of 2014 and conduct simulated transactions for 500 firms from August. The minimum tradable unit as determined by government for emissions trading is 1 t-CO₂. Further, countermeasures to envisaged factors leading to market instability were determined. In detail, such factors are: continuous surges of six months in emission prices of over three times the average price of the two previous years; average trading volume in recent month surging by more than two times the average monthly trading volume for the same months of the two previous years; price surges of more than two times the average monthly price of the same months of the two previous years; and an average price of the most recent month of lower than 60% of the average price of the two previous years. The corresponding countermeasures are: additional allocation of emission allowances up to 25% of reserves; setting of a range for emission retention limit;⁴¹ expansion or contraction of borrowing limits; expansion or contraction of submission limits for offset allowances; and setting of temporary maximum or minimum prices.

In January 2014, the MOSF published the ‘GHG ETS Basic Plan’.⁴² Operational goals for the early phases of ETS in Korea are as follows: Phase I is for the government and target entities to amass a body of practical experience and establish infrastructure for accurately fulfilling MRV, while minimizing the economic burdens by 100% free allocation of emission allowances. In Phase II, significant emission reduction activities will be performed to aid in reaching the national GHG mitigation target for 2020. The technical standards and guidelines for MRV and GHG emissions offset will be enhanced. Moreover, 3% of the total emission allowances will be auctioned and emissions cap setting will be enabled via applying the benchmarking method. In Phase III, the proportion of emission allowances for auction will be increased to at least 10% to encourage further emission reductions. ETS will be further operated to promote voluntary emission reduction activities in preparation for countermeasures for the Post-2020 climate change regime. ETS market liquidity will be enhanced by expanding the participants, third parties such as financial institutions and general investors.

In May 2014, the MOE laid out its ‘National Emission Permit Allocation Plan’ for implementing ETS, which outlines the allocation mechanism and allowance amount for the first implementation period. It is anticipated that 88.7% of national GHG emission reduction target by 2017 will be realized via ETS. The Allocation Plan is described in detail in section, §3.03[D][3].

[C] Predicted Policy Effects of ETS

Cost effectiveness is viewed as a key merit for the government to introduce ETS. Evaluations of several core research institutes in Korea point to ETS being more cost-effective than mandatory regulations, i.e., TMS, and could reduce costs related to

41. The minimum holding limit is 70% of the allowances in the applicable year, and the maximum 150%.

42. MOSF, *supra* n. 29.

the country's 2020 GHG mitigation target by 44%-68%.^{43,44,45} Conversely, KEMCO estimated that the additional production cost would be KRW 5.6 trillion (about USD 943 million) for major industries if 10% of the allowances were allocated by auction. Several other studies revealed similar results in the additional production cost increase in difference scenarios of allowance allocation for ETS introduction in Korea.^{46,47,48}

GIR and KEI jointly analyzed the impacts of ETS in Korea,⁴⁹ the results of which are given in Table 3.6. ETS is anticipated to contribute to emission reductions of 16.9%-22.6% towards realizing the country's 30% BAU mitigation target by 2020. However, implementation of ETS is anticipated to decrease real GDP by 0.05%-0.26%, increase commodity prices by 0.12%-0.37% and to contribute to an energy prices increase of 0.34%-1.79% by 2020. Nonetheless, these figures are still preferable to those resulting from TMS, viz. a 0.13%-0.35% decrease in real GDP, 0.11%-0.13% increase in commodity prices, and 0.09%-0.48% increase in energy prices.⁵⁰

Table 3.6 Analysis Results of ETS Impact in Korea (% Change)

<i>Year</i>	<i>Real GDP</i>	<i>Commodity Prices</i>	<i>Energy Prices</i>
2015	0.00 to -0.02	0.02-0.06	0.01-0.11
2016	0.00 to -0.04	0.02-0.10	0.02-0.25
2017	0.00 to -0.07	0.03-0.15	0.03-0.47
2018	-0.02 to -0.12	0.04-0.21	0.07-0.86
2019	-0.02 to -0.18	0.06-0.28	0.13-1.27
2020	-0.05 to -0.26	0.12-0.37	0.34-1.79

Source: An ETS basic plan proposal (in Korean) (2014).

[D] ETS in Detail

[1] Cap Method, Scope, and Coverage

ETS in Korea is a 'cap & trade' system in principle, in which the government sets an overall limit, the 'cap', on the total amount of emissions allowed from the participants

43. PCGG, Press: *A Comprehensive Economic Impact Analysis of Introduction of the GHG Emissions Trading Scheme* (in Korean), 7 February 2011.

44. Kim, Y.G., *A Study of Development of an Effective Climate Change Adaptation System*, presented at 2nd year anniversary symposium of Green Growth Vision (in Korean) (2010).

45. Lee, J.H., *Economic Effect of the Emissions Trading Scheme* (in Korean), SERI (Samsung Economics Research Institute) (2009).

46. Kim, W.G., *Development of Industry Structure and the Adaptation of the Emissions Trading Scheme* (in Korean), KIET (Korea Institute for Industrial Economics and Trade) (2009).

47. Lee, S.H., *An Analysis of Economic Cost and Institutional Issues of Greenhouse Gas Emissions Trading Scheme* (in Korean), KERI (2010).

48. Steel & Steel, *GHG ETS Should Be Discussed after 2015* (in Korean), 28 February 2011 (available at: http://www.steeldaily.co.kr/news/n_view.asp?NewsID=65218).

49. MOSF, *A Proposal for the ETS Basic Plan* (in Korean) (2014).

50. *Ibid.*

targeted under the system. Emission allowances are then allocated to them based on the national allocation criteria.⁵¹

If an entity reduces its emissions it can bank the spare allowance or sell it to another entity which has emitted GHG in excess of its allocation by a direct trade or the transaction system through KRX. The commitment period is basically five years except for the first two phases, which are periods of three years. The compliance period is one year during each commitment period. One emission allowance traded entails the right to emit one tonne of CO₂. Non-compliance incurs a fine. Six greenhouse gases, namely CO₂, N₂O, CH₄, PFCs, HFCs, and SF₆, are to be covered under the scheme and gasses generated by both direct and indirect means are covered by ETS.⁵² According to the definitions in the Framework Act, direct emissions are those emitted, discharged or leaked to the atmosphere directly by activities that are owned or controlled by the entity and indirect emissions are those resulting from electricity generation, heating and cooling, or steam, generated offsite but purchased by the entity.⁵³

The first phase includes participation of 525 companies comprising either entities emitting over 125,000 t-CO₂ or business sites emitting over 25,000 t-CO₂ annually on average during 2011–2013. The GHG emissions of these companies accounted for about 66% of the national total. Newcomers who become eligible due to the establishment, change or expansion of their facilities will be covered. Companies may also voluntarily participate in ETS regardless of their level of GHG emissions.⁵⁴

[2] Institutions and Procedures to Operate the Scheme

The institutions and management procedures are shown in Figure 3.2. The MOE is in charge of ETS as the competent authority and oversees the entire operation of this scheme, including: the designation and notification of ETS participants; establishment of an allocation plan of emission allowances; determination, adjustment, and cancellation of allowance allocation; monitoring, verification, and certification of emissions quantities; operation of the offset programme; operation of the registry; issuing of penalties; and inspection of compliance status.⁵⁵

51. Article 46(2) of the Framework Act of 2010 (in Korean).

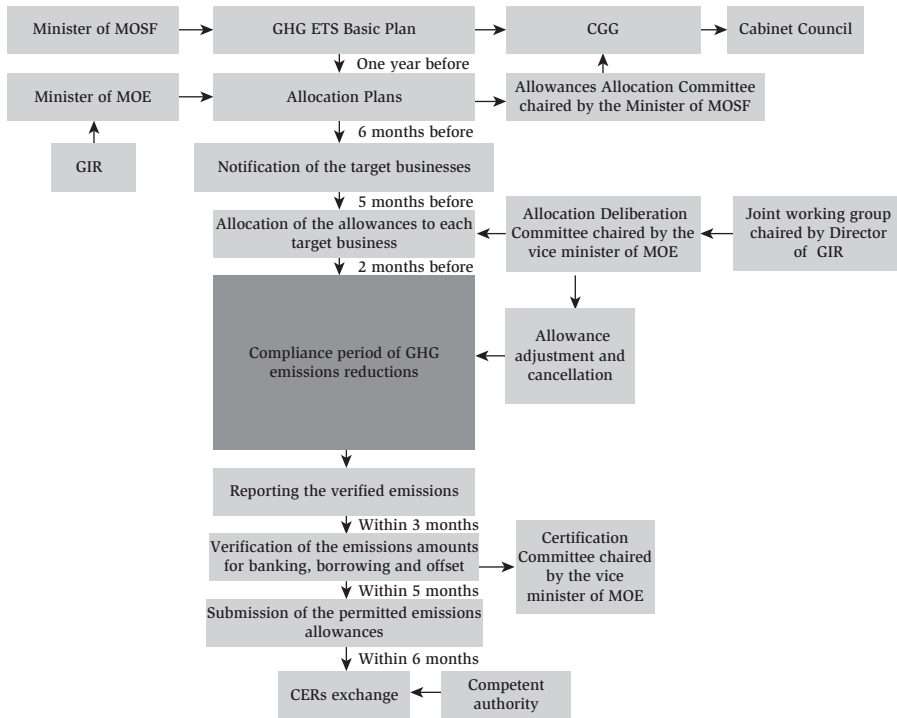
52. Article 2(9) of the Framework Act of 2010 (in Korean).

53. Article 2(10) of the Framework Act of 2010 (in Korean).

54. MOE, *National GHG Emission Allocation Plan* (in Korean), 11 September 2014.

55. Article 3 of the Enforcement Decree of ETS Act of 2012 (in Korean).

Figure 3.2 Institutions for the Management ETS in Korea



Source: Modified from the GHG ETS Basic Plan.

Based on the ETS Basic Plan issued by the MOSF, allocation plans are established through reviews by the Committee on Green Growth and the Cabinet Council after undergoing reviews and adjustments by the Allowance Allocation Committee, chaired by the MOSF, which are to be completed at least six months before the commencement of each implementation phase. The decision, adjustment, and cancellation of allocation amounts will be undertaken by a Joint Working Group chaired by the Director of the GIR. Allocation amounts are then fixed after reviews and adjustments are performed by the Allocation Deliberation Committee, which is chaired by the Vice Minister of the MOE.⁵⁶ The participants are then informed of such no later than two months before the commencement of each compliance year. Emission verification is to be reported within three months after the end of the compliance year in question. Within five months after a compliance year the evaluation results of the certified emission quantity and offset projects need to go through reviews and adjustments by the Certification Committee,

56. Members: Senior government officials from the Ministry of Strategy and Finance; Ministry of Agriculture, Forestry and Fisheries; Ministry of Knowledge Economy; Ministry of Environment; Ministry of Land, Transport and Maritime Affairs; Prime Minister’s Office; Ministry of Foreign Affairs and Trade; Ministry of Public Administration and Security, and experts from related field.

chaired by the Vice Minister of the MOE. The finally approved emissions are then to be submitted to the government within one further month.

[3] Method and Rules of Emission Allowances Allocation

In this Plan, two methods were applied in the context of free allocation of allowances during the first commitment period: grandfathering and benchmarking. Grandfathering was performed for most industries that received emission allowances according to their historical emissions in a base year or base period. For cement, oil refining and air industries, as benchmarking coefficients exist, their allowances are allocated according to performance indicators, i.e. production yields.⁵⁷

As shown in Table 3.7, the BAU projection based on the 2009 estimation indicates that total GHG emissions are expected to reach 776 million t-CO₂ in 2020. Therefore, a national target of 30% GHG emission reduction compared to the BAU level would require Korea to bring about a reduction of 233 million t-CO₂ by 2020, allowing the country to emit 543 million t-CO₂ in total.

*Table 3.7 Total GHG Emissions to Be Permitted in Korea by 2020
(Unit: million t-CO₂)*

No.	Item	2014	2015	2016	2017	2020
(a)	Projected total amount of GHG emissions	694.5	709.9	720.8	733.4	776
(b)	Target GHG emission reduction amount (reduction rate, %)	35.4 (5.1)	71.2 (10.0)	99.6 (13.8)	119.1 (16.2)	233.1 (30.0)
(a)-(b)	Total amount of emissions to be permitted	659.1	637.8	621.2	614.3	543

Source: National GHG Emission Allocation Plan (2014).

57. MOE, *supra* n. 54.

The total emissions by ETS target entities during the first phase were projected based on the ratio of emission forecasts of the entities compared to national total GHG emissions:

$$\text{ETS BAU} = \text{Projected total amount of GHG emissions} \\ \times \frac{\text{Average GHG emissions of target entities of ETS during 2011–2013}}{\text{Total amount of national GHG emissions}}$$

The BAU emissions of each sector are estimated in the same way by applying the share of emissions of each sector in the total ETS BAU. The amount of emissions to be allowed for sectors is estimated considering their reduction rate:

$$\text{Total GHG emissions to be allowed for a sector} \\ = \text{ETS BAU of the sector} \times (1 - \text{sector's reduction rate})$$

Therefore, the total amount of GHG emissions to be permitted is the sum of each sector's emissions to be allowed. The total amount of GHG emissions of a commitment period was obtained as the sum of that of each compliance year. The pre-allocation emission amount in a commitment period is obtained by subtracting the reserved emission amount from the total emission quota of the commitment period. The reserved emission amount is calculated by multiplying the reserve ratio with the total amount of GHG emissions of the compliance period.

The emission allowance allocation of ETS in Korea is summarized in Table 3.8. The Plan refers to the total of emissions to be permitted in the first commitment period (2015-2017) for a total of 525 target business entities in 23 sectors from five fields: power, public & waste, building, transportation and industry. The aggregate amount of emissions for the first phase (2015-2017) announced by MOE is approximately 1,687 billion t-CO₂, which is 76.7% of the total emissions BAU by ETS target entities during the same period (around 2.2 billion t-CO₂). The emissions cap is decreased by 2% for each compliance period of 2015-2017, i.e., individually around 574 million t-CO₂, 562 million t-CO₂ and 551 million t-CO₂. For additional allocations due to unplanned establishment or expansion of facilities or for market stabilization, a total of 89 million t-CO₂ is allocated as a reserve.

Table 3.8 Permitted Emissions by Sector in the First Phase (Unit: thousand KAU (Korea Allowance Unit, 1 KAU ≡ 1 t-CO₂))

Year		2015	2016	2017	Total
Total allowance		573,460	562,183	550,906	1,686,549
Pre-allowance		543,227	532,576	521,924	1,597,728
Allowance reserve		Market stability (14,316); Early action (41,392); Others (33,114)			88,822
Power	Power generation	250,190	245,284	240,379	735,853

<i>Year</i>		<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>Total</i>
<i>Waste/public</i>	Water	768	751	736	2,254
	Waste	8,920	8,745	8,570	26,234
<i>Building</i>	Building	4,017	3,938	3,860	11,815
	Telecommunica- tion	3,089	3,029	2,968	9,086
<i>Transportation</i>	Aviation	1,290	1,264	1,239	3,793
<i>Industry:</i>	Total	274,954	269,564	1,163,119	860,694
	Mining	245	241	236	722
	Food and beverages	2,535	2,485	2,435	7,455
	Textiles/leather	4,701	4,609	4,517	13,828
	Wood	384	377	369	1,130
	Paper	7,630	7,481	7,331	22,443
	Refined oil	19,153	18,778	18,402	56,334
	Petrochemical	48,857	47,899	46,941	143,698
	Glass/ceramics	6,264	6,141	6,018	18,423
	Cement	43,519	42,665	41,812	127,996
	Iron & Steel	103,960	101,921	998,830	357,764
	Non-ferrous metals	6,888	6,753	6,618	20,260
	Machinery	1,416	1,388	1,361	4,165
	Semiconductor	10,455	10,250	10,045	30,749
	Electric other (display)	9,144	8,964	8,785	26,893
	Electric/electronic	2,877	2,821	2,765	8,463
Automobile	4,243	4,160	4,076	12,479	
Shipbuilding	2,683	2,631	2,578	7,892	

Source: National GHG Emission Allocation Plan (2014).

The emission allowances allocated to the covered entities will be determined through the Korean National Allocation Plan, which will be drafted by the Emission Allowance Allocation Committee. The legislation regulates that the allowances will be allocated fully for free in the first phase (2015-2017). In Phase II (2018-2020), 3% of the total emission allowances will be auctioned. The proportion for auction will be increased to at least 10% in Phase III (2021-2025). The sectors that will be given 100% free allocation of emission allowances are defined; such candidates should be businesses allied to industries with: (1) Over 5% in carbon intensity and over 10% in trade intensity; (2) Over 30% in carbon intensity; or, (3) Over 30% in trade intensity. From the third phase, domestic and foreign individuals or corporations can join as parties for the credit transactions.

[4] *Flexibility Mechanism and Penalties*

The Allocation Plan addresses operational criteria for flexibility mechanisms, including banking and borrowing, early action and offsets. Banking of allowances to the next compliance year and the first year of the next commitment year is permitted but between phases is not permitted. Amounts to be banked are unrestricted and can be carried over on an annual basis to successive years, and allowances can be borrowed between compliance years within each implementation phase for up to 10% of emissions in each compliance year.⁵⁸

An early reduction of up to 3% from total allowances from the following fields will be recognized⁵⁹ if: (a) emission reductions were achieved in a KVER domestic programme or TMS pilot project, ETS pilot project or via voluntary reductions; or (b) reductions exceeding those set under TMS.⁶⁰

Offsets may be used for up to 10% of the allocated allowances and specific ratios will be determined by the allocation plan. Offsets abroad shall not exceed 50% of the total offset amount for domestic efficiency reductions. However, offsets from abroad will not be allowed in the first two phases.⁶¹

A fine of three times the average market price of credits and a maximum of KRW 100,000/t-CO₂ (about USD 90/t-CO₂) will be placed on entities failing to submit sufficient allowances in each compliance period.⁶²

§3.04 DELIBERATIONS ON CARBON TAX POLICY IN KOREA

[A] **Current Energy Taxation System**

The existing energy price system was designed based on energy policies that prioritize price stability and domestic industry development over energy saving and environmental damage and is overly complex, as indicated in Table 3.9. Several taxes, including the transportation-energy-environment tax, individual consumption tax, education tax, local motor fuel tax, value-added tax (VAT) and tariff, and various charges are applied to energy resources. This system has been criticized as not truly reflecting the social cost of climate change in energy prices.⁶³

The transportation-energy-environment tax⁶⁴ is an energy-environment related tax imposed on the consumption of gasoline and diesel on a per-litre basis. Originally introduced in 1993 as a transportation tax, it was designed to fund public transportation infrastructure such as roads and railways, with the revenue thereafter going to the

58. Article 36(2) of the Enforcement Decree of ETS Act of 2012 (in Korean).

59. Article 19(4) of the Enforcement Decree of ETS Act of 2012 (in Korean).

60. MOE, Press: *MOE Established 5 Rules for ETS Operation* (in Korean), 4 September 2014.

61. Article 38(4) of the Enforcement Decree of ETS Act of 2012 (in Korean).

62. Article 42(4) of the Enforcement Decree of ETS Act of 2012 (in Korean).

63. Kim, S.R. & Kim, J.Y., *The Design and Economic Effects of Green Fiscal Reform in Korea* (in Korean), KIPF (2010).

64. Transportation-energy-environment tax law, Law number of 11690 of 1993 (last amended 23 March 2013) (in Korean).

'Transportation Facilities Special Account'. The tax assumed its current appellation in 2007 and is scheduled to be abolished by 2015.⁶⁵

Table 3.9 Relative Energy Price Ratio

Year		Gasoline	Diesel	LPG for Transportation	Kerosene	B-C Oil
1999	Ratio	100	47	26	40	22
	(price, KRW)	(1,279)	(604)	(337)	(517)	(276)
2001	Ratio	100	52	32	43	-
	(price, KRW)		(663)	(409)	(548)	
2006	Ratio	100	75	60	55	23
	(price, KRW)		(959)	(767)	(703)	(298)

Source: Yonhap New, *supra* n. 71.

[B] History of and Deliberations on Carbon Tax Policy

After the signing of the UNFCCC in the early 1990s, the MOE studied adopting and modifying the carbon tax policy that had been introduced in Europe.⁶⁶ Much research covered the adverse impacts of a carbon tax on domestic industries; however, the necessity of its introduction in the near future in response to strengthened global environmental regulations was widely agreed on.^{67,68,69} KEEI analyzed the economic impact and policy challenges in implementing a carbon tax, and concluded economic loss would be greater if it was not introduced.⁷⁰

The introduction of a carbon tax by reforming the energy taxation system has been considered from 2000 in Korea. The Presidential Commission on Sustainable Development suggested integrating various charges on water, air pollution, and waste into an environmental tax under the 'Plan of Green Taxation Reform for Sustainable Development'.⁷¹ KEEI recommended reforming the current tax system and applying an energy tax and carbon tax to energy sources based on fuel type and carbon content.⁷²

65. Annex (2) of the Transportation-energy-environment tax law of 1993 (in Korean).

66. Yonhap News, *MOE Reviews a New Carbon Tax* (in Korean), 24 March 1993 (available at: <http://news.naver.com/main/read.nhn?mode=LSD&mid=sec&sid1=105&oid=001&aid=0003742862>).

67. KEEI, *Carbon Tax Impact on Key Industries* (in Korean) (1993).

68. KEEI, *National Energy Basic Plan for Next 10 Years (1997-2006)* (in Korean) (1996).

69. KEEI, *Report on the Impact of Climate Change Negotiation in Industry* (in Korean) (1997).

70. KEEI, *Economic Impacts and Policy Issues of the Energy/Carbon Tax* (Working Paper 9307) (in Korean) (1993).

71. Yonhap News, *Summary of Energy Pricing Reform and Expected Effect* (in Korean), 21 September 1999 (available at: <http://news.naver.com/main/read.nhn?mode=LSD&mid=sec&sid1=101&oid=001&aid=0004451236>).

72. KEEI, *A Proposal for Energy Price Reform* (in Korean), 23 August 1999.

In 2001, the government announced a plan to reorganize the energy price system into one adjusted for relative price ratio between energy sources and increase prices gradually over the subsequent six years from July 2001. The prices for gasoline, diesel, LPG, kerosene and B-C oil are to be respectively set in the proportions of 100:75:60:55:23, as indicated in Table 3.10.⁷³ The reform omits any carbon tax and only covers the traffic and transport sectors. Discussions on the introduction of a carbon tax that includes non-transportation sectors in the near future are emerging.⁷⁴

In 2003, President Noh Moo-hyun (2003-2007) supported the introduction of an environmental tax on fossil fuels during his term.⁷⁵ MOE under the Noh's government proposed a draft Framework Act of Climate Change that incorporated a carbon tax proposal. Industrial lobbying,⁷⁶ however, stalled the introduction of a carbon tax and further strategies and plans were excluded from the third Comprehensive Plan on Countermeasures to Climate Change (2005-2007), which addressed statistical system preparation for the GHG inventory.⁷⁷

After the enactment of the Kyoto Protocol from February 2005, it was widely understood that Korea would be classified into the group with obligations for GHG reduction in the protocol's second commitment period (post-2013) and that preparations therefor should begin. In 2006, MOSF announced a long-term tax reform plan that embraced a carbon tax introduction from 2008 in the form of a tax supplementary to the transportation tax and a special consumption tax.⁷⁸ In December 2007, Noh's government confirmed the Fourth Comprehensive Plan on Countermeasures to Climate Change (2008-2012). The plan involved a total reduction of 72 Mt-CO₂ by 2012, which included 1.8 Mt-CO₂ via industrial voluntary reduction activities, and establishment of a Framework Act of Climate Change (tentative name) by 2009, which outlines the introduction of a carbon tax via replacement of the current transportation-energy-environmental tax.⁷⁹

73. Yonhap New, <Focus> *How the Plan of Energy Tax Reform Changed* (in Korean), 7 September (2000) (available at: <http://news.naver.com/main/read.nhn?mode=LSD&mid=sec&sid1=101&oid=001&aid=0000025229>).

74. Seoul Economic News, *Issues on the Carbon Tax Re-promoting Countering the Kyoto Protocol* (in Korean), 7 January 2005 (available at: <http://economy.hankooki.com/ArticleView/ArticleView.php?url=industry/200501/e2005010719375647430.htm&ver=v002>).

75. Hankookbo, *[The Commission on Presidential Transition] Promote a Carbon Tax on Fossil Fuel* (in Korean), 10 January 2003 (available at: <http://news.naver.com/main/read.nhn?mode=LSD&mid=sec&sid1=102&oid=038&aid=0000166807>).

76. Korea Chamber of Commerce & Industry, *Study on the Impact of Environmental Taxes in Domestic Industry* (in Korean), 22 March 2004.

77. MOE, Press: *Third Comprehensive Plan for Climate Change in Environment Sector in Preparation for the Kyoto Protocol* (in Korean), 2 May 2005.

78. Special Committee for Tax Reform, *Study on Long-Term Tax Reform* (in Korean) (2005).

79. Money Today News, *Government Determined the 4th Comprehensive Plan on Countermeasures to Climate Change* (in Korean), 17 December 2007 (available at: <http://www.mt.co.kr/view/mtview.php?type=1&no=2007121714032467987&outlink=1>).

Table 3.10 Taxes and Charges in the Energy Price as of 2012 in Korea

	Gasoline	Kerosene	Diesel	Heavy Oil	LPG		LNG	Briquette	Electricity		Heat
					Propane (KRW/Kg)	Butane			Household	Night	
	KRW/L	KRW/L	KRW/L	KRW/L			KRW/m ³	KRW/Kg	(KRW/kWh)		KRW/10000 Kcal
Tariff	Crude oil 3 %, petroleum product 5 %	Crude oil 3 %, petroleum product 5 %	Crude oil 3 %, petroleum product 5 %	Crude oil 3 %, petroleum product 5 %	3 %	3 %	3 %	-	-	-	-
Individual Consumption	Crude oil 3 %, petroleum product 5 %	Crude oil 3 %, petroleum product 5 %	Crude oil 3 %, petroleum product 5 %	Crude oil 3 %, petroleum product 5 %	Product 0 %	Product 0 %	2 %	-	-	-	-
Transportation-Energy-Environment Tax	Basic rate	90	-	17	20	252	60	-	-	-	-
	Elasticity	90	-	17	20	275	60	-	-	-	-
Education Tax	Basic rate	475	337	-	-	-	-	-	-	-	-
	Elasticity	529	375	-	-	-	-	-	-	-	-
Local Motor Fuel Tax	79.35	13.5	55.25	2.55	-	41.25	-	-	-	-	-
Value-Added Tax (VAT)	137.54	-	97.5	-	-	-	-	-	-	-	-
Import surcharge	164	107	149	93	118	157	110	-	12	6	73
Quality Inspection Charge	16	16	16	16	-	-	24.2	-	-	-	-
Safety Control Charge	0.47	0.47	0.47	0.47	0.0027	0.027	-	-	-	-	-
Sale Charge	-	-	-	-	4.5	4.5	4.9	-	-	-	-
Electric Power Industry Foundation Fund	(36)	-	-	-	-	62.28	-	-	-	-	-
Sum	-	-	-	-	-	-	-	-	4.44	2.14	-
Price	926.36	226.97	694.22	129.02	142.53	540.06	199.1	-	16.44	8.14	73
%	51.30%	20.20%	42.20%	12.70%	11 %	29.50%	16.40%	-	12 %	12.30%	8.43 %

	Gasoline	Kerosene	Diesel	Heavy Oil	LPG		LNG	Briquette	Electricity		Heat
	KRW/L	KRW/L	KRW/L	KRW/L	Propane (KRW/Kg)	Butane	KRW/m ³	KRW/Kg	Household	Night	KRW/10000 Kcal
Retail Price (July 2012)	1,804	1,122	1,642	1,019	1,300	1,834	1,214	391	167	66	866

Source: Kim, S.R., *Environmental Tax Reform for Green Growth in Korea: The Design of Carbon Tax Scheme*, Paper presented at Fourteenth Global Conference on Environmental Taxation, Kyoto University, Kyoto, Japan, 18-19 October 2013.

However, the succeeding president, President Lee, conducted an overhaul of all GHG reduction policies and revised the Fourth plan established under the former government. As mentioned earlier, Lee's government transformed the energy efficiency policies from VAs to NAs centred on ETS, and placed emphasis on ETS system construction in view of participation in the international carbon market.⁸⁰ Plans to introduce a carbon tax were once more shelved. Meanwhile, Lee's government initiated a three-year project spanning 2008-2010 to explore energy tax reform and discussed scenarios for introduction of a carbon tax in Korea. The project was mainly conducted by the Korea Institute of Public Finance (KIPF), and a report issued therefrom suggested a scenario in which a carbon tax would be introduced in 2013 and replace the extant transportation-energy-environment tax, with lower tax rates applying in the early stage (nearly KRW 4,000/t-CO₂) in light of policy acceptance and minimizing negative impacts.⁸¹

Policymakers are becoming increasingly involved in the carbon tax debate. During the latest presidential election of 2012, major political parties, i.e., the Saenuri Party as the ruling party and the Minjoo Party as the leading opposite Democratic Party, examined a transition from the current transportation-energy-environment tax to a carbon tax.^{82,83} A minor opposition party, the Progressive Justice Party, also pledged to introduce a carbon tax as part of its manifesto in the presidential election campaign.⁸⁴

In 2013, the Progressive Justice Party submitted two proposals on carbon tax introduction to the National Assembly: 'Carbon Tax' and 'Climate Justice Tax'. The taxes were to be levied on the carbon content of various energy sources, with rates calculated based on a 2008 KIPF study analyzing EUETS carbon pricing (EUR 25/t-CO₂, equivalent to KRW 31,328/t-CO₂). It is worth noting that environmental taxes on polluting activities can offer additional benefits, i.e. the so-called 'double dividend', entailing improvements in the environment and economic efficiency by the use of environmental tax revenues to reduce other taxes, such as income tax. However, while both proposals mentioned above do not do away with income or corporation tax (as they were already decreased in the early stages of Lee's government from 2008), they differ in the target energies for taxation and tax accounts for the utilization of tax revenues. Details are provided in Table 3.11, which also compares them in scope with the extant energy taxes.^{85,86} Table 3.12 compares the tax rates.

80. Seoul News, [*Breaking News*] *The New Government Revised the Greenhouse Gas Policies* (in Korean), 15 January 2008.

81. Kim, *supra* n. 63.

82. Sisa News, *Saenuri Party Announced the Presidential Election Pledges July 23* (in Korean) (2012) (available at: <http://www.sisa-news.com/news/article.html?no=39348>).

83. Korea Times, [*Presidential Candidates' Policy Quests*] *Environmental Policy Commitments of Park Geun-hye, Moon Jae-in, and an Cheol-Soo* (in Korean), 14 November 2012 (available at: <http://news.naver.com/main/read.nhn?mode=LSD&mid=sec&sid1=100&oid=038&aid=0002321196>).

84. Tax Daily, *Pledges of Presidential Candidates of Minor Parties* (in Korean), 16 November 2012 (available at: <http://www.joseilbo.com/news/htmls/2012/11/20121116161001.html>).

85. Park, W.S., *Policy Design for the Introduction of Carbon Tax: Climate Justice Tax* (in Korean), May 2015.

86. Shim, S.J., *A Draft of Bill: Carbon Tax* (in Korean), 10 July 2013.

Table 3.11 Comparison of Carbon Tax and Climate Justice Tax Proposals

<i>Item</i>	<i>Existing Energy Taxation*</i>	<i>Carbon Tax**</i>	<i>Climate Justice Tax***</i>
Date of bill proposed	-	10 July 2013	28 June 2013
Date of proposed start of tax	-	1 January 2016 (Annex: Article 1)	1 January 2014 (Annex: Article 1)
Account	Special account for social infrastructure	General account	Special account for climate change
Target energy sources	Gasoline, Diesel, Kerosene, B-C oil, Butane, Profane, LNG	In addition to those under energy taxation, Jet fuel, Naphtha, Nuclear fuel (Article 2)	In addition to those under energy taxation, Briquette, Anthracite, Electricity (Article 2)
Tax payer	Consumer	Energy and fossil fuel supplier (Article 3)	Energy and fossil fuel supplier (Article 3)
Tax rate (See [Table 3.12] for details)	-	10% of 2008 KIPF proposal (Article 2)	10%-30% of 2008 KIPF proposal (Article 2)
Expected total tax revenue	Approx. KRW 22 trillion	Approx. 4.5 KRW trillion during 2016 ~ 2021	Annual approx. KRW 5.0 trillion for the initial period
Revenue recycle	For prevention of environmental pollution and building/maintenance of transportation infrastructure	For sustainable development and climate change mitigation /adaptation policies, renewable energy technologies development, and energy welfare	For CO ₂ reduction, energy transformation from nuclear power, energy welfare and green growth for industry

Source: * Kim, *supra* n. 63, **Shim, *supra* n. 86, *** Park, *supra* n. 85.

The Carbon Tax is intended to be levied on coal and electricity on top of existing energy taxes, and incurs a tax rate of KRW 3,000/t-CO₂ (about USD 2.6/t-CO₂, around 10% of the tax rate initially proposed by KIPF) in initial years, which would then be ramped up. The tax payers are energy and fossil fuel suppliers. The total estimated income from the carbon tax would be between KRW 0.96 and KRW 1.2 trillion annually, with revenues entering the special account for use according to sustainable development and climate change policies.⁸⁷ The tax was assumed to enter into effect on 1 January

87. *Ibid.*

2016. Kim (2013) evaluated the effect of this bill by extrapolating 2009 input-output data and indicated a maximum mitigation rate of 3.59% in GHG emissions from the base scenario with no carbon tax levied.⁸⁸

Table 3.12 A Comparison of Tax Rates of Different Proposals

Energy Type	Unit	Energy Taxation* (VAT Excluded)	KIPF Proposal*	Carbon Tax**	Climate Justice Tax***
Gasoline	(KRW/L)	745.0	67.5	6.7	8
Diesel	(KRW/L)	528.0	82.4	8.2	11
Kerosene	(KRW/L)	104.0	77.7	7.8	0
B-C oil	(KRWL)	20.0	95.5	9.5	19
Butane	(KRW/L)	185.0	53.2	5.3	10
Profane	(KRW/Kg)	20.0	92.0	9.2	15
LNG	(KRW/m ³)	60.0	71.0	8.8	5
Briquette	(KRW/Kg)	-	33.7	3.3	15
Anthracite	(KRW/Kg)	-	-	5.8	0
Electricity	(KRW/kWh)	-	-	1.4	-
Jet fuel	(KRW/L)	-	-	-	15
Naphtha	(KRW/L)	-	-	-	14
Nuclear fuel	(KRW/kWh)	-	-	-	12

Sources: * Kim, *supra* n. 63, **Shim, *supra* n. 86, *** Park, *supra* n. 85.

The Climate Justice Tax proposal includes a nuclear fuel tax on nuclear power plants, with tax rates of KRW 2.5-7.5/kWh initially and rising to KRW 25/kWh to prevent nuclear power plants from being relatively cheaper than the other energies levied. This equates to a tax rate of around KRW 3,000-9,000/t-CO₂, which is 10%-30% of the earlier KIPF proposal. Different rates apply to different energy sources – a lower tax rate on anthracite and kerosene for heating and a higher rate for coal and nuclear power. The bill estimated a total revenue of KRW 5.3 trillion per year in the first period. This proposal addressed the recycling of revenue under the special account for climate change policies and energy transformation from nuclear power.⁸⁹

These two tax proposals are, however, still held up in the National Assembly, and carbon pricing policy progress has been dominated by ETS in recent years in Korea.⁹⁰ Deliberation on carbon tax will likely resurface before the transportation-energy-environment tax ends, at the close of 2015.

88. Kim, *supra* n. 63.

89. Park, *supra* n. 85.

90. National Assembly pending status: available at: http://likms.assembly.go.kr/bill/jsp/BillDetail.jsp?bill_id=PRC_V1T3N0C6I2M8T1D7I3C0S1D3F9D0W0.

[C] Carbon Tax on Vehicles

In 2010, MOE proposed a carbon tax on vehicles (the ‘low carbon car incentive scheme’⁹¹) as one of GHG emission reduction measures affecting the automotive-transport sector. The carbon tax system is designed to subsidize consumers purchasing cars with low carbon emissions, and conversely, tax those purchasing cars with high emissions. Of the total MOE budget for 2013 (6.2 trillion), KRW 151.5 billion was allocated for this scheme,⁹² which the MOE estimated would yield a CO₂ saving of 1.6 million tonnes by 2020 if implemented. In August 2012, an amendment to the ‘Clean Air Conservation Act’⁹³ containing an outline of the low carbon car incentive scheme was passed by the National Assembly and approved for promulgation from July 2013. However, it met heavy resistance from domestic carmakers, which resulted in the implementation period being delayed until January 2015.⁹⁴ According to the Korea Economic Research Institute (KERI), based on a price comparison of domestic and imported cars, those buying imported cars will be less burdened.⁹⁵ The taxes imposed on vehicles are projected to total KRW 2.4 trillion by 2020, 83% of which would come from domestic car sales.⁹⁶ Most of the gasoline-fueled, low-mileage cars are domestically produced, while high-mileage hybrid cars are imported, primarily from Germany and Japan, which would be disadvantageous for domestic car makers under the scheme. In the end, the government has since further delayed the above implementation by over five years to the end of 2020 out of fear of overburdening Korean industry if launched concurrently with the carbon trading scheme.⁹⁷

§3.05 CHALLENGES AND SUGGESTIONS FOR THE IMPLEMENTATION OF ETS IN KOREA

The design and institutional arrangements of ETS have a decisive impact on the cost-effectiveness of this policy.⁹⁸ In spite of the advantage of ETS in economic efficiency confirmed by previous studies, Korean companies do not appreciate the

91. Article 76 (7 and 8) of the Clean Air Conservation Act, Act number of 12248 of 1990 (last amended 14 January 2014) (in Korean).

92. MOE, Press: *6.2 Trillion KRW for 2013 MOE Budget for Environmental Welfare and the Future Environment* (in Korean), 25 September 2012.

93. Clean Air Conservation Act of 1990 (in Korean).

94. MOE, Press: *Subsidy or Grant on Car in Accordance GHG Emission from 2015* (in Korean), 3 April 2013.

95. KERI, [KERI Insight] *Impact Assessment of the Low Carbon Car Incentive Scheme: Relative Price Adjustment Effect between Vehicles* (in Korean), 24 July 2014.

96. JoongAng Daily, *Carbon Tax May Raise Vehicle Prices by \$2,000* (in Korean), 24 June 2014 (available at: <http://koreajoongangdaily.joins.com/news/article/Article.aspx?aid=2991057>).

97. Reuters, *Update2- South Korea Delays Smog Tax Amid Pressure from Car Makers*, 2 September 2014 (available at: <http://www.reuters.com/article/2014/09/02/southkorea-carbon-idUSL3N0R31YM20140902>).

98. Woerdman, E. & van der Gaast, W., *Project-Based Emissions Trading: The Impact of Institutional Arrangement on Cost-Effectiveness*, Mitigation and Adaptation Strategies for Global Change 6(2), 113-154 (2001).

merits of ETS and instead contend to delay its introduction due to fears of negative ramifications – such as loss of business competitiveness due to hiked production costs involved in taking action earlier than other major economies such as the U.S. and Japan. Resistance from industry was identified as the largest barrier to the introduction of ETS in Korea.⁹⁹

The major stumbling block for ETS is its GHG emission estimation and allowance allocation. Industrial groups demand emission caps to be determined on the basis of the latest, most accurate emission data to appropriately reflect any early efforts taken. They also contend that emission allowances recently announced by the government for the first implementation period are too strict, as the national allocation plan is based on the BAU calculated in 2009. This translates as a total reduction rate increase of up to 15% while that forecast by the government was 2.1% based on 2009 BAU.¹⁰⁰ The total of GHG emissions in 2010 and 2012 were increased, at 12.8% and 13.2%, respectively than the level of 2009, which were actually higher, at 5.8% and 4.1%, respectively, than the projected BAU emissions for 2009.¹⁰¹ A shortage of carbon emission rights is likely to occur across industrial sectors, which is expected to stall trading. This would result in penalties associated with additional costs exceeding KRW 27.5 to 29.6 trillion (USD 26.7-28.9 billion) for industry as a whole.¹⁰² In September 2014, the government revised the Allocation Plan and increased the emission reduction to 10% across the board for all industries. It adjusted the emission quota of indirect emissions and power generation industries to the level of 2013-2014 records. In particular, by increasing the reserved emissions, it addressed market stabilization measures to control the allowance price during price surges. However, concerns and questions about the availability of market control remain among domestic experts.¹⁰³

A critical issue for ETS is the stability of carbon credit prices and whether sufficient participants can be secured to enable operation of the carbon market in Korea. The top 25 business entities contribute to 40% of total emissions from the manufacturing industry (excluding the power sector) in Korea and 76% of emissions covered by TMS (including indirect emissions) in 2011 came from only 10 entities.¹⁰⁴ Such lopsided ratio of GHG emission emitters to ETS targets in Korea may cause low credit liquidity and instability of carbon prices.¹⁰⁵ In such context, the *power sector will*

99. Liu, X.B., Suk, S.H. & Sudo, K., *GHG Emissions Trading Schemes in Northeast Asia: An Overview and Analysis of Current Scenarios*, in Kreiser, L., Sterling, A.Y., Herrera, P., Milne, J.E. & Ashiabor, H. (eds), *Carbon Pricing, Growth and the Environment*, Edward Elgar Publishing, Inc., Northampton, MA, pp. 149-166 (2012).

100. Hankyung News Paper, *ETS Market Stability Price Set at 10 Thousand Won, 'Industry Relieved from the Charges' vs 'Not Realistic'* (in Korean), 23 July 2014 (available at: <http://www.hankyung.com/news/app/newsview.php?aid=2014072311121&intype=1>).

101. MOE, Press: *In 2012 the Country's Total Greenhouse Gas Emissions is 608.83 Million Tons CO₂eq with an Increase Rate of 0.4%* (in Korean), 3 November 2014.

102. The Korea Times, *Gov't May Delay Carbon Trading Plan*, 18 July 2014 (available at: http://www.koreatimes.co.kr/www/news/biz/2014/07/123_161284.html).

103. Hankyung News Paper, *supra* n. 100.

104. *Ibid.*

105. Suk, S.H. & Liu, X.B., *A Survey Analysis of Company Perspectives on the GHG Emissions Trading Scheme in the Republic of Korea*, *Critical Issues-volume XIV-Carbon Pricing, Growth and the Environment*, pp. 289-306.

be required to play a central role in activating trading. The power sector was allocated 735 million KAU during the first planning period, accounting overall for 43.63% of the total emission allowances. The actual emissions of this sector are expected to reach 834 million t-CO₂. *As regards EUETS, emissions trading takes place at the same time as power trading occurs under the deregulated electricity market.* However, as Korean power companies are state-owned they cannot pass on the cost of emissions trading to electricity bills, which could put a damper on *emissions trading*.

Enhanced support for SMEs is necessary. In the past, regulations specific to industrial energy efficiency and GHG reductions in Korea were focused on the larger companies rather than the SMEs.¹⁰⁶ However, the criteria strengthened by Korea's Government for the NAs recently have resulted in a large number of SMEs becoming targets of new policy instruments. For example, the number of SMEs under TMS in 2012 was 120, with a share of 32.1% of the entities from industrial and power sectors. TMS targets from these two sectors had then risen to 560 and the share of SMEs to 40% by 2014.¹⁰⁷ Further, a previous survey confirmed that SMEs targeted by TMS are still at an early stage in energy saving,¹⁰⁸ thus the gap between rapid policy progress and the laggard response on the side of companies to energy and climate issues is a cause for concern as regards implementation of ETS in Korea. Information dissemination and financial support by the government are needed in this context.

In addition to emission abatement with lower costs, another primary purpose of ETS is to induce company investments in advanced energy efficiency technologies.¹⁰⁹ According to studies investigating the impact of EUETS based on managerial interviews at firms, EUETS has captured the attention of decision makers and impacted somewhat on the innovation and investment of low carbon technologies.¹¹⁰ The question is to what extent ETS in Korea could also generate incentives for inducing investments in low-carbon technologies. Usually, marginal costs of carbon emission reductions for energy-intensive companies are high. The energy efficiency of the most energy intensive petrochemical and iron and steel sectors in Korea has outpaced their counterparts in other countries.¹¹¹ The remaining potential in energy saving and carbon mitigation can only be achieved by systematic optimization of production processes and application of more efficient equipment, which only produces minor outcomes for energy efficiency. Further, under ETS, the companies from these sectors may tend to buy emission credits from the carbon market rather than spend their

106. Hong, W.S., *A Study on the Wffect of GHG Reduction Regulation Affecting SMEs* (in Korean), Korea Small Business Institute (2010).

107. MKE, *Press: 74 Companies in Industry and Power Sectors for GHG-Energy Target Management Scheme* (in Korean), 28 September 2010 (available at: <http://www.mke.go.kr>).

108. Suk S.H., Liu, X.B. & Sudo, K., *A Survey Study of Energy Saving Activities of Industrial Companies in the Republic of Korea*. *Journal of Cleaner Production* 41, 301-311 (2013).

109. Laing, T., Sato, M., Grubb, M. & Combetti, C., *Assessing the Effectiveness of the EU Emissions Trading System*, Centre for Climate Change Economics and Policy, Working Paper No. 126, Grantham Research Institute on Climate Change and the Environment, Working Paper No. 106, January 2013.

110. *Ibid.*

111. IEA, *Implementing Energy Efficiency Policies: Are IEA Member Countries on Track?*, OECD/IEA, Paris (2009).

capital on investments in innovation and application of low carbon technologies. The government therefore needs to consider encouraging companies to invest in and facilitate energy-efficient technologies. It actually provides financial supports for companies that invest in energy reduction facilities via long-term and low-interest loans for a portion of project costs.¹¹² However, according to a survey targeting Korea energy intensive companies under TMS, only few entities have obtained this governmental financial support. It is thus apparent that Korean companies prefer stable, long-term incentives, e.g. lower electricity prices over one-time financial subsidies,¹¹³ which implies complementary policy measures are needed to satisfy business expectations and achieve their understanding for smooth implementation of ETS in Korea.

§3.06 CONCLUSIONS

The reduction of GHG emissions to mitigate the adverse effects of climate change has been gaining attraction as a high-priority agenda within the international community over the past two decades. Carbon trading, one of the GHG reduction mechanisms defined under the Kyoto Protocol, has been implemented in the EU and other areas and has rapidly promoted the international carbon market. Korea is one of the heavy GHG emitters and shows an upward trend in emissions. Whilst not being subject to the GHG reduction obligation under the Kyoto Protocol, Korea approved implementation of a domestic ETS from 2015 as a main tool to realize its national GHG emission goal in a cost-effective way. The government then laid the related legal basis and established an institutional infrastructure for ETS implementation. The national GHG inventory and MRV system have been developed. More recently, the principal design features of ETS were determined and the government has formulated an emission allowance allocation plan based on sectors. Nevertheless, this scheme has faced a huge wall of opposition from industry. Although progress in negotiations between the government and industry looked yet again to be stalled due to the nitty-gritty of emission allowance allocation just months before the start of the scheme, it now looks as if the scheme may start on schedule thanks to revisions to the allocation plan by the government to embrace the requirements of industry.

Meanwhile, discussions on the carbon tax have steadily progressed since Korea's signup to the UNFCCC and concern countermeasures to strengthened international trade barriers resulting from the introduction of environmental taxes in developed countries and demands to reduce GHG emissions. The introduction of a carbon tax has been pushed back several times in Korea due to strong opposition from industry. In 2013, two proposals regarding the introduction of a carbon tax were submitted, which are now held up in the National Assembly. Discussions are likely to resume when the transportation-energy-environment tax ends, in 2015.

Given that Korea's energy saving policies have been oriented by company VA with the policy focus on energy price stability and industry development, the adoption

112. KEMCO, *Energy-Climate Change Handbook 2013* (in Korean) (2013).

113. Suk, *supra* n. 108.

of stricter measures to reduce GHG emissions in Korea by market-based instruments, such as ETS and a carbon tax, will involve obstacles and challenges. Concerns and uncertainties still exist but should be addressed during the actual operation of the scheme for further policy stringency in later phases. Only few studies on the optimal policy mix of existing policies, such as mandatory measures and voluntary initiatives and carbon pricing tools have been carried out in Korea. The government must exert continuous efforts to resolve the problems outlined above and seek solutions in order to close the gap in policy design and ensure smooth implementation, and achieve the policy goals.