

# Table of Contents

p. 9 Introduction

11 Chapter 1

*The Hydrate-based Carbon Capture for the Exploitation of NGH*

- 1.1. NGH Exploitation: an Over-supply of Environmental Friendly Gas Supply, 11
- 1.2. Energy Demand Perspectives and Economic Growth, 15
- 1.3. The Persistent Growth of the Hydrocarbon Demand in the Short-medium Term and the Instability if Its Pricing System, 20
- 1.4. Impact Effects on the Electrical System, 32

39 Chapter 2

*The Perspectives of the Exploitation of NGH. Reflections on the Energy Security and the Efficiency of the Industrial Chains of a New Over-Supply of Natural Gas*

- 2.1. The Recovery of the Centrality of “Energy security”, 39
- 2.2. Perspectives for an Increasing Sureness in Gas Provision and Availability, 41
- 2.3. Persistent Risks and Renewed Role for Gas Storage: Claims for a More Stringent and Effective Storage Regulation in Europe, 43
- 2.4. NGH Over Supply: Energy Source Availability and Opportunity, 46
- 2.5. Perspectives for an Increasing Provision of Environmental Neutral Natural Gas: NGH, 54

57 Chapter 3

*The Prospects of NGH Over-Supply with the Affirmation of the LNG Supply Chain*

- 3.1. The Energy Crisis and the Affirmation of LNG, 57
- 3.2. LNG Distribution and Infra-gas Competition, 59
- 3.3. The Leadership of LNG in the Current Energy Scenario, 63
- 3.4. LNG: a New Baseload Supply for the European Market, 66

	3.5. LNG and “Environmental Neutral Gas” Are Expected to Be Central to Decarbonizing: the Case of Maritime Sector, 71
	3.6. A Technical-economic Analysis of a Possible Future Over-supply. Estimation of the Effects of the Systematic Expansion of Hydrates with the Characterization of Environmental Neutrality, 75
p. 79	Chapter 4 <i>“NGH&amp;HbCC” as Input for Hydrogen Industry. From Blue to a “New Green Hydrogen”</i>
	4.1. HbCC Process for a New Hydrogen Industry, 79
	4.2. A Color’s Labels for Hydrogen Industries, 81
	4.3. NGH Option for Blue Hydrogen, 83
	4.4. Perspectives for a New Hydrogen Economy: CCS and Hydrogen Public Policies, 86
	4.5. Perspectives for a New Hydrogen Economy: Evidences for an Economic and Political Analysis, 89
	4.6. Investigation on Impact of Energy Regulation and Macroeconomic Variables on Technological Innovation of Green Energy Transition Policy, 94
	4.7. Towards the Application of “Sector Coupling”: From Hydrogen Cogeneration to the Integrated Use of Gas Networks, 98
101	Chapter 5 <i>Focus on the Energy Transition: Resistances, Difficulties, Costs. The Opportunities of Hydrate-based Carbon Capture for a new NGH Supply</i>
	5.1. The Inevitability of Energy Needs from Fossil Sources and the Goals of Secarbonisation, 101
	5.2. A Pragmatic Approach toward More Sustainability of Our Quantitative Growth: Improve Methane Quota in Energy Mix, 104
	5.3. LCOE Analysis: Perspectives for Sustainable Energetic Mix, 106
	5.4. Environmental Neutrality and Availability: HbCC Opportunities for NGH Exploitation, 118
	5.5. Economic Analysis of HbCc Application to NGH Exploitation for CH <sub>4</sub> Production, 120
	5.6. CO <sub>2</sub> Implicit Avoid Costs, 126
	5.7. LCOE and LCA: Evaluation Methodologies for the Evaluation of Energy Mixes in Light of the HbCC Perspective for the Exploitation of NGH, 132

p.	137	Chapter 6
		<i>Investments Perspectives for International Financial Operators and Funds. Strategic Guidelines</i>
		6.1. Needs for Investments and Opportunities for Investors, 137
		6.2. Guidelines for Investors and for the Strategic Repositioning of Energy Utilities, 139
		6.3. Rationale for a Public Sustainable Strategy to Attract Private Investments: a Mix of Public Funding and Asset Based Regulation, 142
		6.4. Grasp the Opportunity: Building a Teaser for Investors, 145
		6.5. Equity Financing <i>vs.</i> Debt Financing: an Overview Applied for HbCC Investments to Exploit NGH, 147
	151	Conclusion. Increasing Room for Future Studies
	157	References