

Preface

Humankind, for its continued existence, requires not only such essentials as food, clean water, shelter, and clothing materials, but also large amounts of energy. Ever since cavemen succeeded in kindling fire, our ancestors have used a variety of sources for heating and cooking, ranging initially from wood and vegetation followed by peat moss and other carbon-based fuels. Since the industrial revolution, the major source of energy was coal to which, during the twentieth century, oil and natural gas were added. The latter resources – termed “fossil fuels” – were formed by Nature over eons, but once combusted they are not renewable on our human time scale and are thus increasingly depleted by overuse. Our readily accessible oil and gas reserves may not last much past the twenty-first century, while coal reserve may be available for another century or two. We need, therefore, to find new ways and resources for the future.

This book discusses a new approach based on what we call the “Methanol Economy[®]”. The production of methanol directly from still-available fossil fuel sources, and the recycling of carbon dioxide via hydrogenative reductions, are – we believe – feasible and convenient ways to store energy generated from all possible sources including, alternative energy sources (solar, hydro, wind, geothermal, etc.) and atomic energy. In the short term, new efficient production of methanol not only from still-available natural gas resources (without going through the syn-gas route) but also by the hydrogenative conversion of carbon dioxide from industrial exhausts, offer feasible new routes. In the long term, recycling of the carbon dioxide captured from the air itself will be possible. Air, in contrast to oil and gas resources, is available to everybody on Earth, and its CO₂ content represent an inexhaustible recyclable carbon resource. Methanol produced from this CO₂ (using any energy source to produce the required hydrogen from water), is an excellent fuel on its own for internal combustion engines or fuel cells of the future. It can be also readily converted, via its dehydration to ethylene and propylene, into synthetic hydrocarbons and their products. Consequently, it can free mankind’s dependence on our diminishing oil and natural gas (even coal) resources. At the same time, by being able to recycle excess CO₂ we can mitigate or eliminate a major source of global climate change – that is, warming of the Earth – caused by human activities.

We are fully aware that to solve our outlined problems for the future, including energy storage and transportation, non-oil- and gas-based fuels and raw materials for the production of synthetic hydrocarbons and their products (to which we are accustomed in our everyday life) and new approaches are needed. Much has been said about the future in view of our diminishing and non-renewable fossil fuel resources. The outlined “Methanol Economy” is one of the feasible and achievable solutions, which deserves serious further consideration and development. We hope that this book will call more attention to this approach, and spur future activities in the area.

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