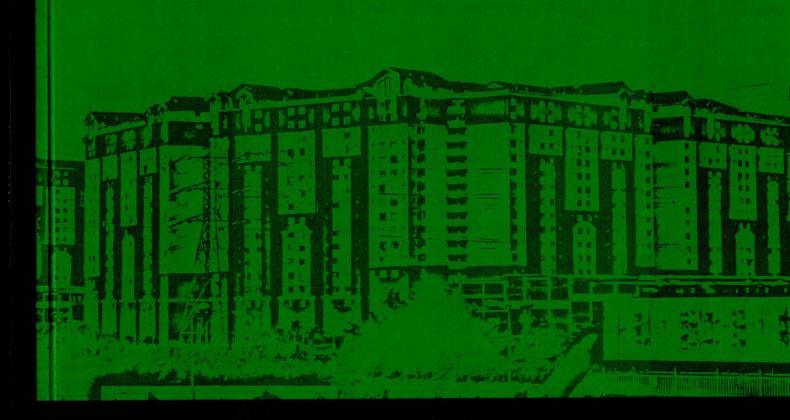
Energy,
Environment
and Sustainability
of Green Buildings



Shamzani Affendy Mohd Din Moustafa Anwar Moustafa Muhammad Abu Eusuf



IIUM PRESS
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

ENERGY, ENVIRONMENT AND GREEN BUILDINGS

Editors Shamzani Affendy Mohd Din Moustafa Anwar Moustafa Muhammad Abu Eusuf



INTERNATIONAL ISLAMIC UNIVERSITY OF MALAYSIA

Published by: **IIUM Press** International Islamic University Malaysia

First Edition, 2011 ©IIUM Press, HUM

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 any prior written permission of the publisher.

Perpustakaan Negara Malaysia Cataloguing-in-Publication Data

Individual contributors copyright © Asst. Prof. Dr. Shamzani Affendy Mohd Din, Moustafa Anwar Moustafa, Rawia Marwan Abdul Aziz, Soran Hama Aziz Ahmed, Hamror Shikheldin & Azrina Alip: Energy, Environment and Sustainability of Green Buildings

ISBN: 978-967-418-034-8

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM (Malaysian Scholarly Publishing Council)

Printed by:

HUM PRINTING SDN. BHD.

No. 1, Jalan Industri Batu Caves 1/3 Taman Perindustrian Batu Caves Batu Caves Centre Point 68100 Batu Caves Selangor Darul Ehsan

CONTENTS

List of Figures	Contents	111
List of Tables		
Foreword xi Preface xii Contributors Biography xiv SECTION 1: ENERGY AND IMPACT TOWARDS ENVIRONMENT Chapter 1: Energy Crisis &Water Pollution 1 Shamzani Affendy Mohd Din & Moustafa Anwar Chapter 2: The Negative Impact of Nuclear Energy on Environment 11 Shamzani Affendy Mohd Din & Rawia Marwan Abdul Aziz Chapter 3: Air Pollution Generated From Coal Fuel Fired Power Plant 19 Shamzani Affendy Mohd Din & Soran Hama Aziz Ahmed Chapter 4: Global Warming as A Phenomenon of Climate Change 35 Shamzani Affendy Mohd Din & Hamror Shikheldin Chapter 5: Impact of Hydroelectric Dams on the Environment 44	-	
Preface xii Contributors Biography xiv SECTION 1: ENERGY AND IMPACT TOWARDS ENVIRONMENT Chapter 1: Energy Crisis &Water Pollution 1 Shamzani Affendy Mohd Din & Moustafa Anwar Chapter 2: The Negative Impact of Nuclear Energy on Environment 11 Shamzani Affendy Mohd Din & Rawia Marwan Abdul Aziz Chapter 3: Air Pollution Generated From Coal Fuel Fired Power Plant 19 Shamzani Affendy Mohd Din & Soran Hama Aziz Ahmed Chapter 4: Global Warming as A Phenomenon of Climate Change 35 Shamzani Affendy Mohd Din & Hamror Shikheldin Chapter 5: Impact of Hydroelectric Dams on the Environment 44		
SECTION 1: ENERGY AND IMPACT TOWARDS ENVIRONMENT Chapter 1: Energy Crisis &Water Pollution		
Chapter 1: Energy Crisis &Water Pollution	Contributors Biography	xiv
Chapter 1: Energy Crisis &Water Pollution		
Chapter 1: Energy Crisis &Water Pollution		
Shamzani Affendy Mohd Din & Moustafa Anwar Chapter 2: The Negative Impact of Nuclear Energy on Environment	SECTION 1: ENERGY AND IMPACT TOWARDS EN	<u>VIRONMENT</u>
Shamzani Affendy Mohd Din & Moustafa Anwar Chapter 2: The Negative Impact of Nuclear Energy on Environment	Chantar 1: Knargy Crisis & Water Pollution	1
Chapter 2: The Negative Impact of Nuclear Energy on Environment		
Shamzani Affendy Mohd Din & Rawia Marwan Abdul Aziz Chapter 3: Air Pollution Generated From Coal Fuel Fired Power Plant	Shamzani Affendy Mohd Din & Moustafa Anwar	
Chapter 3: Air Pollution Generated From Coal Fuel Fired Power Plant	Chapter 2: The Negative Impact of Nuclear Energy on Environme	ent11
Shamzani Affendy Mohd Din & Soran Hama Aziz Ahmed Chapter 4: Global Warming as A Phenomenon of Climate Change	Shamzani Affendy Mohd Din & Rawia Marwan Abdul Azi	iz
Chapter 4: Global Warming as A Phenomenon of Climate Change	Chapter 3: Air Pollution Generated From Coal Fuel Fired Power	Plant 19
Shamzani Affendy Mohd Din & Hamror Shikheldin Chapter 5: Impact of Hydroelectric Dams on the Environment	Shamzani Affendy Mohd Din & Soran Hama Aziz Ahmed	
Chapter 5: Impact of Hydroelectric Dams on the Environment	Chapter 4: Global Warming as A Phenomenon of Climate Change	e35
	Shamzani Affendy Mohd Din & Hamror Shikheldin	
	Chapter 5: Impact of Hydroelectric Dams on the Environment	44

SECTION 2: GREEN BUILDING PROJECTS

Chapter 6: Oregon Health & Science University - Center for Health & Healing, USA
Shamzani Affendy Mohd Din & Moustafa Anwar Moustafa
Chapter 7: DR Byen Building in Copenhagen-Denmark66
Shamzani Affendy Mohd Din & Soran Hama Aziz Ahmed
Chapter 8: California Academy of Science, California, USA
Shamzani Affendy Mohd Din & Rawia Marwan Abdul Aziz
Chapter 9: NEXT21 – Osaka, Japan
Shamzani Affendy Mohd Din & Hamror Shikheldin
Chapter 10: GEO (Green Energy Office) Bangi, Malaysia100
Shamzani Affendy Mohd Din & Azrina Alip

75 CHAPTER EIGHT - CASE STUDY: CALIFORNIA ACADEMY OF SCIENCE Shamzani Affendy Mohd Din & Rawia Marwan Abdul Aziz

CHAPTER EIGHT - CASE STUDY: CALIFORNIA ACADEMY OF SCIENCE

Shamzani Affendy Mohd Din & Rawia Marwan Abdul Aziz

8.1 INTRODUCTION

As a certain reflect of hazard energy emission and arising awareness towards environment, sustainable energy and green architecture have become the new concern over the wide global issues. Green Architecture or in other words ecological design seeks to harness natural sources of energy and to increase their ability to generate their own energy in terms of enhancing efficiency and moderation in the use of materials, energy, and development space by using different techniques (Elliott, 2007).

8.2 CASE STUDY

The green architecture California Academy of Sciences which resided in Golden Gate Park for San Francisco in California in United States.

8.2.1 Country background in terms of location

California Academy of Sciences in San Francisco is one of the ten largest natural history museums worldwide that houses 18 million natural history specimens, over 10,000 living specimens, and includes aquaria, a planetarium, rain forests, research laboratories, public exhibit space (Kociolek,2005).

California is the most populous and third largest state located on the west coast of the United States, bordering the Pacific Ocean as figure1 clarifies. It is both physically and demographically diverse. California includes some of the largest cities in the USA including Los Angeles, San Diego, San Jose and San Francisco as shown in figure 2. Its state capital is Sacramento (California, 2011).

San Francisco is located on the West Coast of the United States at the tip of the San Francisco Peninsula. It includes significant stretches of the Pacific Ocean and San Francisco Bay within its boundaries as Figure 45 illustrates. It encompasses a land area of about 121 km2. (US Census, 2011).