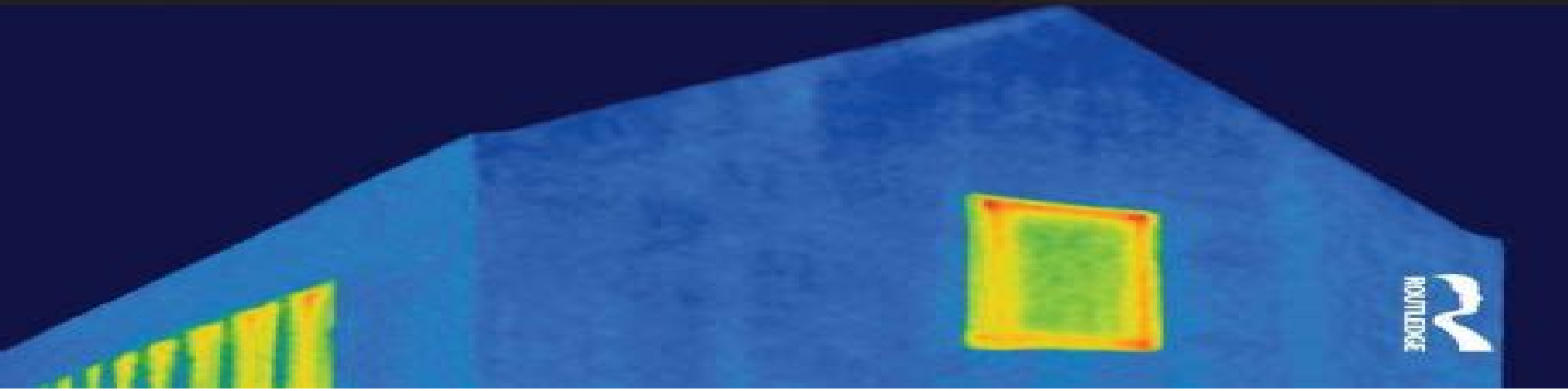
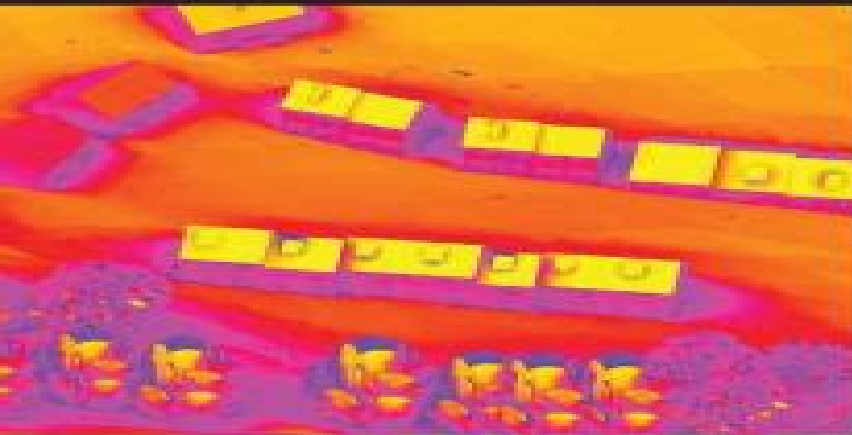


# THE PASSIVHAUS DESIGNER'S MANUAL

A technical guide to low and  
zero energy buildings

EDITED BY

**CHRISTINA J. HOPFE AND ROBERT S. McLEOD**



# Passivhaus Designers Manual Technical Buildings

**Michael Rajnik**



## **Passivhaus Designers Manual Technical Buildings:**

*The Passivhaus Designer's Manual* Christina Hopfe, 2017-11-28 Passivhaus is the fastest growing energy performance standard in the world with almost 50 000 buildings realised to date Applicable to both domestic and non domestic building types the strength of Passivhaus lies in the simplicity of the concept As European and global energy directives move ever closer towards Zero fossil Energy standards Passivhaus provides a robust fabric first approach from which to make the next step The Passivhaus Designers Manual is the most comprehensive technical guide available to those wishing to design and build Passivhaus and Zero Energy Buildings As a technical reference for architects engineers and construction professionals The Passivhaus Designers Manual provides State of the art guidance for anyone designing or working on a Passivhaus project In depth information on building services including high performance ventilation systems and ultra low energy heating and cooling systems Holistic design guidance encompassing daylight design ecological materials thermal comfort indoor air quality and economics Practical advice on procurement methods project management and quality assurance Renewable energy systems suitable for Passivhaus and Zero Energy Buildings Practical case studies from the UK USA and Germany amongst others Detailed worked examples to show you how it s done and what to look out for Expert advice from 20 world renowned Passivhaus designers architects building physicists and engineers Lavishly illustrated with nearly 200 full colour illustrations and presented by two highly experienced specialists this is your one stop shop for comprehensive practical information on Passivhaus and Zero Energy buildings

**The Passivhaus Designer's Manual** Christina Hopfe, Robert McLeod, 2015-10-05 Passivhaus is the fastest growing energy performance standard in the world with almost 50 000 buildings realised to date Applicable to both domestic and non domestic building types the strength of Passivhaus lies in the simplicity of the concept As European and global energy directives move ever closer towards Zero fossil Energy standards Passivhaus provides a robust fabric first approach from which to make the next step The Passivhaus Designers Manual is the most comprehensive technical guide available to those wishing to design and build Passivhaus and Zero Energy Buildings As a technical reference for architects engineers and construction professionals The Passivhaus Designers Manual provides State of the art guidance for anyone designing or working on a Passivhaus project In depth information on building services including high performance ventilation systems and ultra low energy heating and cooling systems Holistic design guidance encompassing daylight design ecological materials thermal comfort indoor air quality and economics Practical advice on procurement methods project management and quality assurance Renewable energy systems suitable for Passivhaus and Zero Energy Buildings Practical case studies from the UK USA and Germany amongst others Detailed worked examples to show you how it s done and what to look out for Expert advice from 20 world renowned Passivhaus designers architects building physicists and engineers Lavishly illustrated with nearly 200 full colour illustrations and presented by two highly experienced specialists this is your one stop shop for comprehensive practical information on Passivhaus and Zero Energy

buildings      **New Financial Strategies for Sustainable Buildings** Stephen Finnegan, 2017-07-20 Built environment professionals considering whether to embark on the design and construction or retrofit of a fully sustainable or green build need to know the financial implications of their decisions What are their financial options What are the risks This book offers practical guidance on how sustainable building projects are financed designed and built All too often sustainable building is undertaken without proper consideration of the true lifecycle cost risk and financial impact This book will take the reader on a journey from initial sustainable design through to final completion highlighting the finance options available to them New Financial Strategies for Sustainable Buildings provides key guidance to a variety of professionals including architects designers contractors construction managers investors and other interested parties whilst providing a useful reference to students on architecture construction management and real estate surveying courses who need to know about finance construction economics and sustainable development projects      *Spon's Architects' and Builders' Price Book 2017* AECOM, 2016-10-26 UK construction shows its underlying strength Tender prices have risen strongly since last year's book was compiled increasing by around 8% and at an annualised rate of close to 10% in the last half year Spon's Architects and Builders Price Book 2017 compiled by AECOM still provides the most accurate detailed and professionally relevant construction price information for the UK Its unique Tender Index updated through the year gives an ongoing reality check and allows you to adjust for changing market conditions Although it suits a wide range of project sizes this is the only price book which sets out a detailed cost base for contracts exceeding 4 000 000 in value Use the access code inside the front cover of the book to get set up with internet access to this 2017 edition until the end of December 2017 We now provide a VitalSource ebook giving a versatile and powerful online data viewing package Major changes have been made to this 142nd edition Major revision and simplification has been made to the in situ concrete section and plasterboard linings and partitions sections have been heavily revised and developed New Cost Models are included a laboratory a car park and an updated London Office More plant prices have been separated out in the measured works section As well as an overhaul of prices several new items have been added including Foamglas insulation Carlite waterproof concrete and an expanded range of stone flooring along with the standard features you have come to expect from Spon's A B 20 000 prices for the most frequently specified items the majority with labour constants and detailed build ups Hundreds of alternative materials prices for the more unusual items Detailed guidance on wage rates daywork cost limits and allowances property insurance and professional fees plus useful formulae design criteria and trade association addresses Updated free of charge two or three times a year see inside for registration details Updates are available online at [www.pricebooks.co.uk](http://www.pricebooks.co.uk)      *Research Anthology on Environmental and Societal Well-Being Considerations in Buildings and Architecture* Management Association, Information Resources, 2021-05-28 When it comes to architecture there has been a focus on sustainable buildings and human well being in the built environment Buildings should not only be environmentally friendly and sustainable but dually focused

on human health wellness and experience This includes considerations into the quality of buildings ranging from ventilation to thermal comfort along with environment considerations such as energy usage and material selection Specific architectural choices and design for buildings can either contribute to or negatively impact both society and the environment leading research in the field of architecture to be focused on environmental and societal well being in accordance with the built environment The Research Anthology on Environmental and Societal Well Being Considerations in Buildings and Architecture focuses on how the built environment is being constructed to purposefully enhance societal well being while also maintaining green standards for environmental sustainability On one side this book focuses on the specific building choices that can be made for the purpose of human well being and the occupants who will utilize the building On the other side this book also focuses on environmental sustainability from the standpoint of green buildings and environmental concerns Together these topics allow this book to have a holistic view of modern architectural choices and design This book is essential for architects IT professionals engineers contractors environmentalists interior designers civil planners regional government officials construction companies policymakers practitioners researchers academicians and students interested in architecture and how it can promote environmental and societal well being *Spon's Architects' and Builders' Price Book 2018* AECOM,2017-09-22 Construction prices rose over the last year by 5% according to AECOM's tender price index with construction price inflation continuing to run above the long run average The main drivers are rising input costs Producer price indices have moved up at a clip in recent quarters with sharp increases in prices for materials and fuels consumed by UK manufacturers Demand and supply side factors make the probability of short term price falls very slim SPON S ARCHITECTS AND BUILDERS PRICE BOOK 2018 compiled by AECOM still provides the most accurate detailed and professionally relevant construction price information for the UK Its unique Tender Index updated through the year gives an ongoing reality check and allows you to adjust for changing market conditions Although it suits a wide range of project sizes this is the only price book which sets out a detailed cost base for contracts exceeding 4 000 000 in value Use the access code inside the front cover of the book to get set up with a VitalSource ebook of this 2018 edition This versatile and powerful online data viewing package is available for use until the end of December 2018 Major changes have been made to this 143rd edition New Cost Models for a retail distribution unit a palliative care unit and a cinema As well as an overhaul of prices several new items have been added including An expanded range of beam block flooring Rainwater harvesting with a precast concrete tank A precast concrete flow attenuation system Precast concrete communication boxes along with the standard features you have come to expect from SPON S ARCHITECTS AND BUILDERS PRICE BOOK 20 000 prices for the most frequently specified items the majority with labour constants and detailed build ups Hundreds of alternative materials prices for the more unusual items Detailed guidance on wage rates daywork cost limits and allowances property insurance and professional fees plus useful formulae design criteria and trade association addresses Updates free of charge two or three

times a year see inside for registration details Updates are available online at [www.pricebooks.co.uk](http://www.pricebooks.co.uk) Passive House Details Donald Corner, Jan Fillinger, Alison Kwok, 2017-08-09 Passive House Details introduces the concepts principles and design processes of building ultralow energy buildings The objective of this book is to provide design goals research analysis systems details and inspiring images of some of the most energy efficient carbon neutral healthy and satisfying buildings currently built in the region Other topics included heat transfer moisture management performance targets and climatic zones Illustrated with more than 375 color images the book is a visual catalog of construction details materials and systems drawn from projects contributed from forty firms Fourteen in depth case studies demonstrate the most energy efficient systems for foundations walls floors roofs windows doors and more Energy, People, Buildings Judit Kimpian, Sofie Pelsmakers, Hattie Hartman, 2021-03-04 Energy performance feedback is an essential tool in addressing the current climate crisis However this is not simply another theoretical text about energy performance in buildings This book is for anyone who wants to better understand how energy is used in buildings and how to drive down operational energy use whether you re an architect student client building services engineer contractor building operator or other stakeholder Focusing on evidence from feedback on buildings in use it explains what it takes to get them to perform as expected as well as the reasons why they often fail Energy People Buildings draws extensively on the findings of studies UK government funded building performance evaluations and on original research into seven case studies from across the UK and abroad that have achieved exemplary energy use through building performance feedback Providing a clear roadmap to understanding aspects that impact building users comfort and satisfaction it also outlines the factors behind energy use and how to track it across the life of a project to ensure that your building performs as intended Case studies include the Everyman Theatre Liverpool Rocky Mountain Institute Innovation Center Colorado and Carrowbreck Meadow Norwich Featured architects AHMM AHR Architype Hamson Barron Smith Haworth Tompkins Henning Larsen Architects and ZGF Architects Designing Zero Carbon Buildings Using Dynamic Simulation Methods Ljubomir Jankovic, 2017-06-23 In addition to the application of fundamental principles that lead to a structured method for zero carbon design of buildings this considerably expanded second edition includes new advanced topics on multi objective optimisation reverse modelling reduction of the simulation performance gap predictive control nature inspired emergent simulation leading to sketches that become alive and an alternative economics for achieving the sustainability paradigm The book features student design work from a Master s programme run by the author and their design speculation for a human settlement on Mars Tasks for simple simulation experiments are available for the majority of topics providing the material for classroom exercise and giving the reader an easy introduction into the field Extended new case studies of zero carbon buildings are featured in the book including schemes from Japan China Germany Denmark and the UK and provide the reader with an enhanced design toolbox to stimulate their own design thinking *Designing Zero Carbon Buildings* Ljubomir Jankovic, 2024-06-17 In this significantly

revised third edition *Designing Zero Carbon Buildings* combines embodied and operational emissions into a structured approach for achieving zero emissions by a specific year with certainty Simulation and quantitative methods are introduced in parallel with analogue scale models to demonstrate how things work in buildings Where equations are provided this is also explained with common analogue objects pictures and narratives A Zero Equation introduced in this book is not only explained as an equation but also as an analogy with a jam jar and spoons making the book accessible for a range of audiences Tasks for simple experiments exercises discussion questions and summaries of design principles are provided in closing lines of chapters This book introduces new case studies in addition to an updated case study of the Birmingham Zero Carbon House applying embodied and operational emissions to assess their status using the Zero Equation The approach introduced brings about a sense of realism into what true zero emissions mean Written for students educators architects engineers modellers practising designers sustainability consultants and others it is a major positive step towards design thinking that makes achieving zero carbon emissions a reality

***Building Performance Analysis*** Pieter de Wilde, 2018-07-23  
Explores and brings together the existent body of knowledge on building performance analysis Shortlisted in the CIBSE 2020 Building Performance Awards Building performance is an important yet surprisingly complex concept This book presents a comprehensive and systematic overview of the subject It provides a working definition of building performance and an in depth discussion of the role building performance plays throughout the building life cycle The book also explores the perspectives of various stakeholders the functions of buildings performance requirements performance quantification both predicted and measured criteria for success and the challenges of using performance analysis in practice Building Performance Analysis starts by introducing the subject of building performance its key terms definitions history and challenges It then develops a theoretical foundation for the subject explores the complexity of performance assessment and the way that performance analysis impacts on actual buildings In doing so it attempts to answer the following questions What is building performance How can building performance be measured and analyzed How does the analysis of building performance guide the improvement of buildings And what can the building domain learn from the way performance is handled in other disciplines Assembles the current body of knowledge on building performance analysis in one unique resource Offers deep insights into the complexity of using building performance analysis throughout the entire building life cycle including design operation and management Contributes an emergent theory of building performance and its analysis Building Performance Analysis will appeal to the building science community both from industry and academia It specifically targets advanced students in architectural engineering building services design building performance simulation and similar fields who hold an interest in ensuring that buildings meet the needs of their stakeholders

***The Routledge Companion to Smart Design Thinking in Architecture & Urbanism for a Sustainable, Living Planet*** Mitra Kanaani, 2024-11-11  
This comprehensive companion surveys intelligent design thinking in architecture and urbanism investigates multiple facets

of smart approaches to design thinking that augment the potentials of user experiences as well as his her physical and mental interactions with the built environment Split into six paradigms this volume looks at the theoretical and historical background of smart design smart design methodologies and typologies smart materials smart design for extreme weather and climatic regions as well as climate change issues and side effects smart mobility and the role of digital technologies and simulations in architectural and urban design Often at odds with each other this volume places emphasis on smart design for various typologies and user groups emphasizing on advancements in form making and implementation of technology for healthy and sustainable living environments Written by emerging and established architects planners designers scientists and engineers from around the globe this will be an essential reference volume for architecture and urban design students and scholars as well as those in related fields interested in the implications various facets and futures of smart design

*Routledge Handbook of the History of Sustainability* Jeremy L. Caradonna, 2017-10-18 The Routledge Handbook of the History of Sustainability is a far reaching survey of the deep and contemporary history of sustainability This innovative resource will help to define the history of sustainability as an identifiable field It provides a unique resource for advanced undergraduates graduate students and scholars and delivers essential context for understanding the current state and future path of the sustainability movement The history of sustainability is an increasingly important domain within the discipline of history which draws on an interdisciplinary set of fields ranging from energy studies transportation and urbanism to environmental history economics and philosophy Key sections in this handbook cover the historiography of sustainability resilience and collapse in historical societies the deep roots of sustainability seventeenth century to nineteenth century the recent history of sustainability twentieth century to present and core issues and key debates in sustainability This handbook is an invaluable research and teaching tool for those interested in the history and development of sustainability and an essential resource for the many sustainability studies programs that now exist in the world s universities **Sustainaspeak** Elizabeth Lewis, 2018-02-01 Architecture 2030 BUG Biophilic Design BIPV Circular Economy LEED Passive Design Solar Chimney Systems Thinking WELL Xeriscaping What does it all mean The complex and evolving language used in the sustainable design community can be very challenging particularly to those new to environmentally friendly and resource efficient design strategies that are needed today Definitions of over two hundred terms with further sources Clearly cross referenced with Sustainaspeak Theoryspeak and Archispeak terms Illustrated throughout with sustainable award winning buildings by e g Behnisch Brooks Scarpa EHDD KieranTimberlake Lake Flato Leddy Mahtum Stacy SmithGroup Perkins Will ZGF VMDO and McDonough Partners Sustainaspeak A Guide to Sustainable Design Terms provides a current guide to the sustainable design strategies terms and practices needed for the next generation of designers architects students and community leaders to design a carbon neutral world for future generations **Creating Capacity and Capability: Embracing Advanced Technologies and Innovations for Sustainable Future in Building Education and Practice**



Monty Sutrisna, Mostafa Babaeian Jelodar, Niluka Domingo, An Le, Ravindu Kahandawa, 2025-07-19 This three volume book is the proceeding of the 46th Australasian Universities Building Education Association AUBEA 2023 Conference which brings together papers on construction and built environment education and practice This particular conference theme Creating Capacity and Capability Embracing Advanced Technologies and Innovations for Sustainable Future in Building Education and Practice is closely related to a flagship national research programme funded by the Government of New Zealand known as the CanConstructNZ research programme aiming to balance the capacity and capability in the construction industry and the national pipeline of construction projects The capacity and capability of our construction industry in fulfilling the construction needs of the whole nation are reflected in the national pipeline of construction projects and have long been recognised as one of the main challenges facing the construction sector The practices and education of building and construction play an important role in determining the capacity and capability of the construction industry Within the context of achieving sustainable future and embracing advanced technologies to create capacity and capability in the construction sector various concepts research and innovative development have emerged and taken place This particular conference theme has facilitated more in depth discourses and discussions on the latest ideas and innovation within the building and construction education and practice not only from the Australasian region but also from the wider international community including the USA the UK Brazil South Africa Nigeria China and Sri Lanka The contents of this book will be of interest to academic researchers industry professionals and policy makers alike

*Advancements in Sustainable Architecture and Energy Efficiency* González-Lezcano, Roberto A., 2021-06-18 Thermal comfort and indoor air quality IAQ issues have gained significant interest in the scientific and technical community involved in building performance analysis and other related subjects In terms of thermal comfort the achievement and maintenance of a thermally acceptable indoor environment is affected by energy costs and energy poverty is a widespread problem globally There is a call for energy efficient architecture for a developed and sustainable world However with the use of renewable energy that increased considerably in recent years new technical challenges arose for the energy sector Consumers are key players in this context as flexibility in demand is crucial to cope with the intermittent nature of most renewable energy sources Active demand side participation is particularly important to ensure the efficient use of locally and globally available energy Sustainability human comfort and healthy living environments have become top priorities *Advancements in Sustainable Architecture and Energy Efficiency* explores how housing is a key health factor for individuals and looks at factors such as air quality ventilation hygrothermal comfort lighting physical environment building efficiency and other areas as important pieces in healthy architecture It discusses how the poor application of these parameters can directly affect human health and how sustainable architecture provides a solution Beyond just labeling the important facets of architecture for healthy living this book will look at different perspectives of energy consumption and demand to ensure sustainable energy increased energy efficiency improved energy

policies and reasonable energy costs for homes This book is ideal for architects designers engineers energy engineers environmental scientists practitioners researchers academicians and students interested in architecture that is both conducive to healthy living and energy efficiency Retrofitting for Optimal Energy Performance Tantau, Adrian,2019-06-14 Retrofitting expresses in a traditional approach the process of improving something after it has been manufactured constructed or assembled These systems integrate new technologies new functions and new services that increase the energy performance in existing private public and commercial buildings Retrofitting for Optimal Energy Performance is a comprehensive reference source that examines environmentally conscious technologies and their applications in advancing retrofitting practices Providing relevant theoretical frameworks and the latest empirical research findings in the area it highlights an array of topics such as climate change energy management and optimization modeling and is essential for academicians students researchers engineers architects entrepreneurs managers policymakers and building owners

**Research Anthology on Clean Energy Management and Solutions** Management Association, Information Resources,2021-06-25 Energy usage and consumption continue to rise globally each year with the most efficient and cost effective energy sources causing huge impacts to the environment In an effort to mitigate harmful effects to the environment implementing clean energy resources and utilizing green energy management strategies have become worldwide initiatives with many countries from all regions quickly becoming leaders in renewable energy usage Still not every energy resource is without flaws Researchers must develop effective and low cost strategies for clean energy in order to find the balance between production and consumption The Research Anthology on Clean Energy Management and Solutions provides in depth research that explores strategies and techniques used in the energy production field to optimize energy efficiency in order to maintain clean and safe use while delivering ample energy coverage The anthology also seeks solutions to energy that have not yet been optimized or are still produced in a way that is harmful to the environment Covering topics such as hydrogen fuel cells renewable energy solar power solar systems cost savings and climate protection this text is essential for electrical engineers nuclear engineers environmentalists managers policymakers government officials professionals in the energy industry researchers academicians and students looking for the latest research on clean energy management

**Transforming Issues in Housing Design** Kutay Guler,2023-11-02 TRANSFORMING ISSUES IN HOUSING DESIGN A practical and complete resource for students researchers and practitioners of housing design Transforming Issues in Housing Design delivers a comprehensive vision for the design philosophy psychology efficiency and constitution of housing This collection of articles explores many of the most pressing and relevant issues related to the ongoing transformation of housing design Twenty two contributed chapters discuss the past and current state of housing design how it evolved to become what it is today and finally how it may unfold in the future A team of global experts presents the most up to date research and a diverse and illuminating collection of examples to highlight housing design around the world Readers will also find A

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**Encyclopedia of Sustainable Technologies** Martin Abraham, 2017-07-04 Encyclopedia of Sustainable Technologies Eight Volume Set provides an authoritative assessment of the sustainable technologies that are currently available or in development Sustainable technology includes the scientific understanding development and application of a wide range of technologies and processes and their environmental implications Systems and lifecycle analyses of energy systems environmental management agriculture manufacturing and digital technologies provide a comprehensive method for understanding the full sustainability of processes In addition the development of clean processes through green chemistry and engineering techniques are also described The book is the first multi volume reference work to employ both Life Cycle Analysis LCA and Triple Bottom Line TBL approaches to assessing the wide range of technologies available and their impact upon the world Both approaches are long established and widely recognized playing a key role in the organizing principles of this valuable work Provides readers with a one stop guide to the most current research in the field Presents a grounding of the fundamentals of the field of sustainable technologies Written by international leaders in the field offering comprehensive coverage of the field and a consistent high quality scientific standard Includes the Life Cycle Analysis and Triple Bottom Line approaches to help users understand and assess sustainable technologies

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In a digitally-driven earth where displays reign great and immediate communication drowns out the subtleties of language, the profound strategies and psychological subtleties concealed within phrases usually go unheard. However, situated within the pages of **Passivhaus Designers Manual Technical Buildings** a interesting fictional value blinking with raw feelings, lies an exceptional journey waiting to be undertaken. Written by a skilled wordsmith, this marvelous opus encourages readers on an introspective trip, gently unraveling the veiled truths and profound affect resonating within ab muscles material of each and every word. Within the mental depths with this moving evaluation, we shall embark upon a sincere exploration of the book is core themes, dissect its captivating publishing design, and fail to the powerful resonance it evokes serious within the recesses of readers hearts.

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