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Factor Five: Transforming the Global Economy through 80% Improvements in Resource Productivity

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Ernst Ulrich von Weizsacker, Charlie Hargroves, Michael H. H. Smith : Factor Five: Transforming the Global Economy through 80% Improvements in Resource Productivity before purchasing it in order to gage whether or not it would be worth my time, and all praised Factor Five: Transforming the Global Economy through 80% Improvements in Resource Productivity:

0 of 0 people found the following review helpful. A MANUAL OF TECHNOLOGIES FOR MACRO LEVEL POLICY MAKERS By Nirmalan Dhas This book has the potential to function as a manual of technologies for macro level policy makers engaged in the formulation of policies for the management and mitigation of the impact of Rapid Resource Depletion and to a lesser extent that of Pollution and Global Climate Change. The book belongs to the thinking that characterized the first decade of the 21st century and which took as its basic premise that of a purely technological response to these challenges and which therefore reads as a litany of technological prescriptions designed to increase resource productivity making it an essential part of the technological toolkit of those engaged in the field of development planning.

1 of 1 people found the following review helpful. good ideas, many errors in content, not such great presentation By Ronald W. Garrison This was a really perplexing book; it does some things so well, yet gets others so wrong. If you read my other reviews, you'll probably notice that I have this impression about many other books. But it seems to be true of Factor Five to an unusual degree. If I try to think of adjectives to describe Factor Five, one word that comes to mind is "wonky." There is obviously a lot of research behind its many pages, with a blizzard of footnotes. There are quite a few good ideas, and most of them I agree with. Certainly increasing efficiency must be a large part of the solution to the energy problem; and some major problems other than energy as well, such as water. We may need to replace 30 terawatts of power before this is all over; and over half of them may end up being "negawatts." Putting out generally correct and important information is the good part of this book. Unfortunately, the presentation is not always as good as the content. For one thing, there is sometimes sloppy handling of numbers. Some examples: p 218: "Private car ownership globally is expected to grow from 646 million cars in 2005 to 12 billion by 2030, an increase of 20 times." The way that's phrased makes it clear that's not just a misprint. That's ridiculous! Not only would that be a growth rate of 13%/year, but it would mean at least 3 cars for every person eligible to be a driver on the planet; more than 4 times the rate of even the car-crazy US! p 241: "In Australia, despite a significant shift away from shipping to trucking between 1973 and 2003, a 2007 report by the Australia Institute concluded that shipping is well over 80 percent more efficient than trucking freight...." Considering the context, apparently they really mean to say down 80%, or a factor of 5 (as in the book title); but to say "80 % more efficient" sounds like 1.8 times as efficient, which of course is not nearly as big a change. Which is it? p 23: "hellip; Sir Nicholas Stern came to the conclusion that if action is not taken, the economic impacts associated with climate change would reduce the global GDP by between 5 and 20 per cent each year." Taking that literally implies the total collapse of the world economy in just a few years! Down 20% in one year, then 20% more the year after that... even the Great Depression didn't descend on us that fast (although Russia's collapse in the 1990s probably did). I'm thinking that Stern probably meant that GDP growth would be less than expected by 5; 20%. That's still a huge problem, but not even on the same plane as the other interpretation. The authors were not clear about the numbers, and that's a recurring problem. p 220: "Particularly as public transport, walking and cycling need less land for infrastructure and associated requirements (parking etc.), with a single lane of railway able to carry up to 50 000 persons per hour (pph), a busway 7000 pph, and a highway lane just 2500 pph." At first glance, I had to wonder what walking has to do with railways or busways. Apparently they're referring to width of multiple walkways totaling as much as a railway or busway. But even if you accept that way of looking at it (which TTTT still strikes me as strange), it's hard to gauge the significance of people walking by one point at 50 000 persons per hour, since they're walking so much more slowly than trains, buses, or cars. p 183: Soil can sequester 0.6; 1.0 billion tons of carbon/year; So say the authors; but then they quote the IPCC saying that agriculture could sequester up to 6000 MTCO₂/yr (which would be around 1.8 billion tons of carbon). Those two figures seem to disagree by almost a factor of two. There are errors other than numerical quantities. Some more examples: p 54: "It was found that up to 60% lower greenhouse gas emissions values can be obtained by using alternative refrigerants." Nothing is said about what these refrigerants would be, or anything about them. (Maybe the cited source had more to say, but that should have been included in the chapter text.) p 223: "Since its invention in the early 1800s, the humble bicycle has been a mainstay of private transportation, losing popularity only in the 1900s with the advent of the automobile." This is some really bad history, since the bicycle as we know it hardly even existed before the 1900s. As Wikipedia puts it: "Starley's 1885 Rover, manufactured in Coventry, is usually described as the first recognizably modern bicycle." So how did the bicycle manage to lose popularity before it even could have gained it? Maybe it had a small rise and fall in use, only to later become much more popular around the world, especially where few people could afford cars. But I'm just speculating; the authors certainly have not described the situation clearly. p 225: "JR East Group has also manufactured and is currently trialling the world first [sic] diesel hybrid electric passenger train." What are they talking about? Diesel locomotives ARE hybrid electric. p 330: Fig. 8.1; US energy productivity doubled, energy consumption rose 37% (1974; 2007); But in that interval population went up 47%, so per capita it must have dropped slightly. Where's the rebound effect? Besides the numerical and factual errors, the writing was generally quite inept; even though, I must acknowledge, the authors often had very worthwhile things to say. Errors in detail (spelling, word choice, punctuation, and so on) are frequent, but it goes farther. The phrasing, and the overall style of writing, strongly indicate that this was written by someone whose native language is not English. This would not be a serious problem

at all, with a good editor to revise everything before publication. But it's clear that no such revision was undertaken. Maybe we should go to Factor 6, or even Factor 10, for a sequel. Such a reduction might well be feasible, with some of the exciting developments that has appeared since this book's publication. There is certainly more need than ever for correct, timely information on these subjects. 2 of 2 people found the following review helpful. Detailed, thought-provoking recap of how to reduce world energy use by a factor of five. By Rolf Dobelli. Recycling garbage, turning off lights, taking shorter showers: All these actions contribute to the reduction of energy consumption. Written as a joint project by Ernst von Weizsäcker, the author of Factor Four, and by four experts from The Natural Edge Project, an environmental research group, this call to action argues for a "whole-system approach" that unites engineers, designers, scientists and builders to create new products, processes, buildings, homes, factories and stores to reduce energy consumption by 80%, diminishing it to one-fifth of current usage, by 2050. A mountain of research, statistics, case studies and examples provide a strong, documented case that achieving "sustainable consumption" without forgoing prosperity not only is possible but necessary. getAbstract recommends this work to policy makers, executives, engineers, designers and all those who want to know why they should keep separating their plastic from their glass.

When first published in 1997, *Factor Four: Doubling Wealth, Halving Resource Use* by renowned economic and engineering experts Ernst von Weizsäcker, Amory Lovins and L. Hunter Lovins, transformed how economists, policy makers, engineers, entrepreneurs and business leaders thought about innovation and wealth creation. Through examples from a wide range of industrial sectors, the authors demonstrated how technical innovation could cut resource use in half while doubling wealth. Now twelve years on, with climate change at the top of the world agenda and the new economic giants of China and India needing ever more resources, there is a unique historic opportunity to scale up resources productivity and radically transform the global economy. And *Factor Five* is the book set to change all of this. Picking up where *Factor Four* left off, this new book examines the past 15 years of innovation in industry, technical innovation and policy. It shows how and where factor four gains have been made and how we can achieve greater factor five or 80%+ improvements in resource and energy productivity and how to roll them out on a global scale to retool our economic system, massively boost wealth for billions of people around the world and help solve the climate change crises. Spanning dozens of countries including China and India and examining innumerable cases of innovation in design, technology and policy, the authors leave no engineering and economic stone unturned in their quest for excellence. The book tackles sustainable development and climate change by providing in depth Factor 5 resource productivity studies of the following sectors: Buildings, Industry, Agriculture, Food and Hospitality, and Transportation. In its systematic approach to demonstrating how Factor 5 can be achieved, the book also provides an overview of energy/water nexus and energy/materials nexus efficiency opportunities across these sectors. Given that these sectors are responsible for virtually all energy usage and greenhouse gas emissions globally, this book is designed to guide everyone from individual households, businesses, industry sector groups to national governments in their efforts to achieve the IPCC recommended target of 80 per cent reductions to greenhouse gas emissions. It also looks at innovation in regulation to increase resource productivity, pricing, carbon trading, eco-taxation and permits and the role of international institutions and trade. The authors also explain exciting new concepts such as bio-mimicry and whole system design, as hallmarks for a new generation of technologies. The last part of the book explores transformative ideas such as a long term trajectory of gently rising energy and resource prices, and new concepts of well-being in a more equitable world. Like its predecessor this book is simply the most important work on the future of innovation, business, economics and policy and is top drawer reading for leaders across all sectors including business and industry, government, engineering and design and teaching. This book is full colour throughout. Published with The Natural Edge Project

"As economic, environmental, and security imperatives converge, advanced resource productivity is quickly rising to the top of the global agenda. But let's make no little plans: new technologies, artfully combined via integrative design, can now quintuple the work wrung from energy, water, and other resources. Building on our 1997 collaboration in *Factor Four*, and cross-pollinating with new findings from around the world, this exciting synthesis combines a powerful efficiency toolkit with farsighted policy insights - vital to ensure that efficiency's gains are not offset but reinforced to create a richer, fairer, safer, and cooler world." — Amory B. Lovins, Chairman and Chief Scientist, Rocky Mountain Institute, USA, Co-Author of 'Factor Four' "This book shows once again, even to the most conservative critics, that not only are significant improvements possible, they are profitable, and when coupled with the understanding that reducing environmental devastation is critical, provide a vital message of hope for the future." — Hunter Lovins, President, Natural Capitalism Solutions, Co-Author of 'Factor Four' "The fivefold increase of resource productivity described in this book is impressive, but perfectly feasible, and it would give the world a bit more time to learn how to adapt." — Dennis Meadows, Co-author *Limits to Growth* and 2009 Japan Prize Laureate "The exciting thing about *Factor Five* is the combination of boldness and realism, precisely what is needed to get civilization back onto an economic path that is environmentally sustainable." — Lester R. Brown,

President, Earth Policy Institute "The potential to reduce emissions by 80% on an economically viable basis is good news for world leaders and their negotiators on climate change." ndash;nbsp;Dr R K Pachauri, Chairman, Intergovernmental Panel on Climate Change (IPCC) "Factor Five is the clearest non-partisan handbook on ecological renaissance available to date and should be read by every policymaker and practitioner." ndash;nbsp;Professor Calestous Juma, Harvard Kennedy School "The arrival of Factor Five couldn't be more timely - or more significant." ndash; Jonathon Porritt, Founding Director, Forum for the Future, UK "The mounting concern about climate change has distracted attention from the fact that CO2 emissions are just part of the existential problem facing humanity. We need urgently to reduce our use of ALL the resources, not just fossil fuels. This new book is the best point of departure I know for doing that. The fivefold increase of resource productivity it describes is impressive, but perfectly feasible, and it would give the world a bit more time to learn how to adapt to ecological collapse. The book has two especially important innovations. The authors deal seriously with the rebound effect, and they base their scenarios on a long term trajectory of rising energy prices." ndash;nbsp;Dennis Meadows, Co-author Limits to Growth and 2009 Japan Prize Laureate "Is it possible to imagine a world where we can actually phase out fossil fuels before the climate phases us out? It's now feasible by reading Factor Five." ndash; Peter Newman, Professor of Sustainability, Curtin University and author of Resilient Cities "[There can be] no sustainable development without a sustainable development of companies. Factor Five provides compelling arguments and examples that sustainable business is achievable and profitable on a large scale and that companies play a key role in creating sustainable development. Factor Five confirms the crucial role of increasing eco-efficiency to foster sustainable development." ndash; Stefan Schaltegger, Professor of Sustainability Management, Leuphana University, Germany "The world needs radical eco-innovation to shape an opportunity out of the current crisis. This book provides excellent key examples in a systems perspective. Written by radical thinkers with a unique experience on how change can be managed, this book is a must-reading for both leaders and academics." ndash;nbsp;Prof. Dr. Raimund Bleischwitz, Wuppertal Institute, Co-Director 'Material Flows and Resource Management' Professor at the College of Europe, Bruges/Belgium "Some may have ignored the message of Factor Four 15 years ago. We can no longer afford to ignore it, and should now embrace the strengthened message of Factor Five." ndash;Professor Bedrich Moldan, Senator, Czech Republic, Former Chairman, European Environment Agency, and former Czechoslovak Environment Minister "We are living in the most exciting era of human history. We are in the process of expanding our perspectives from a focus on short-term economic and materialistic growth to a whole-system approach with true, long-term happiness for all at its core. We are adding the need for 'sufficiency' to 'efficiency' and 'productivity' in our discussions on how to reduce human impacts on the Earth. Economy and ecology are not an 'either-or' trade-off. We now know that both are critical in every aspect of society. We must advance science and technology based on values and vision. The 'leapfrog' effect should be promoted in developing nations-not only in terms of technology but also in terms of lifestyles and societal values. Our urgent imperative is to figure out how to maximize happiness while minimizing environmental impacts. Factor Five provides the West and East alike with a compass to set our visions and to measure our progress." ndash; Junko Eda, Environmental Affairs Journalist, co-Chief Executive, Japan for Sustainability "Factor Five is the clearest non-partisan handbook on ecological renaissance available to date. It should be read by every policymaker and practitioner irrespective of their political position on global change." ndash;nbsp;Professor Calestous Juma, Harvard Kennedy School "We all know what will happen if we go on producing and consuming the same way as in the twentieth century. But we don't really know how to produce and consume in the planet-friendly way. This is why we need this book. So urgently." ndash; Brice Lalonde, French Climate Ambassador, former environment minister of France "Strong economic signals and innovative technologies make a powerful combination, and are the best hope - indeed, the only hope - of the changes needed to protect the environment. Building on the robust foundation of Factor Four, Ernst von Weizsacker and his colleagues write an inspiring manifesto for change to reduce resource use while minimising the impact on living conditions. If their recipe is sometimes over-optimistic, that is a good fault. The environment needs some optimistic friends these days." ndash; Frances Cairncross, Exeter College, Oxford (Author of Costing the Earth) "Climate change represents the biggest challenge our generation has experienced. Factor Five shows us through sustainable business practices we can achieve positive environmental and economic outcomes. They are not mutually exclusive concepts - sustainability is just good business." ndash; Dan Atkins, Managing Director, Shaper Group "Even if the climate were not changing, the need for the transition from fossil fuels to renewable, regenerative systems would be just as urgent. This is a recipe book for a far more economically rational world, as well as a more sustainable one." ndash; Professor Janis Birkeland, Queensland University of Technology (QUT), and author of Positive Development "Every lawyer and lobbyist who is asked to defend 'Business As Usual' should read Factor Five. This manual for re-engineering the future holds out both hope and profit in equal parts - if only we can get the political framework right, and align the lobbies with the interests of humanity." ndash;nbsp;Tom Spencer, Former Member of the European Parliament, Founder and Executive Director of the European Centre for Public Affairs, and Vice Chairman, Institute for Environmental Security "Today, the world is faced by many challenges which all derive from the unsustainable practices with which we use our resources. Despite the most severe global economic crisis, resource prices have not returned to the low price levels of the 1990's, demonstrating that we have to reduce our

'resource obesity' as an economy and come to sustainable levels of resource consumption. A factor five improvement in resource efficiency is not only necessary, it is imperative for economies and companies to survive in a new resource and atmosphere-constrained world. This book not only clearly makes this point, but also shows that it is possible with what we know today. This key message makes this book essential reading." ndash;nbsp;Professor Ernst Worrell, Utrecht University, Lead Author, IPCC Working Group III, Fourth Assessment Report (2004 - 2007) "Factor Five is about how to achieve the resource productivity gains that are necessary for the world to avoid a future with declining human wellbeing. It provides a clear way forward. In the past, the pursuit of efficiency gains has sometimes led to loss of resilience, resulting in unexpected and unwanted outcomes (like salinized irrigation systems). I applaud the Factor Five initiative, and urge it to embrace the equally important goal of maintaining resilience in the face of the looming global shocks confronting the world." ndash;nbsp;Dr Brian Walker, CSIRO Research Fellow, Resilience Alliance Program Director and Chair of Board About the AuthorProfessor Ernst von Weizsacker is Co-Chair, International Panel on Sustainable Resource Management. He is also the lead author of Factor Four (Earthscan 1998). Karlson Charlie Hargroves, Michael H. Smith, Peter Stasinopoulos and Cheryl Desha are members of The Natural Edge Project, a Sustainability Think-Tank hosted by Griffith University and the Australian National University.