

Making the Modern World: Materials and Dematerialization By Vaclav Smil **Kindle Making the Modern world** An arrangement that could allow more frequent changes of models and that would assure complete recycling at the end of a product's life is not to sell any major manufactured items but merely rent them on long-term service contracts and then return them to their makers for disassembly and reuse: this approach could be applied to products ranging from computers to car tires and from refrigerators to air conditioners. **Making the Modern World kindle** Now even the most efficient production processes and the highest practical rates of recycling may not be enough to result in dematerialization rates that would be high enough to negate the rising demand for materials generated by continuing population growth and rising standards of living. **EPub Making the Modern world a better** 257 - Stahl writes about the service economy 'where success is measured in wealth (stock) and its usage value' not as in today's arrangement where success depends on throughput and its exchange in value. **The making of the modern world** The first half or so is extremely tedious.

America in the modern world pdf

With such intense research and data collection from the author he truly gave an in depth breakdown of the usage trend and potential life span of our limited natural resources on planet earth. **The making of the global world pdf** As he was in the topic I would look around my immediate environment to see the amount of things around me and asking are all these essentials? Do I know the cost beyond the dollar and cents that is spent on them? A question that you normally asked us in class what is the real cost? My take looking at the data and charts given the assumption was that as lifestyle improve choice of material substitution for materials there would be decline from wood to metal plastic to silicon. **Making the Modern worldcoin** The shifting into industrialization age as well many developed countries stop manufacturing outsourcing them to developing countries the quick demand from the shift adds to the require of materials. **EBook Making the Modern world-system** With phones in the numbers of billions soon to be equivalent to the global population (in fact adding PC tablets and other gadgets that number would already surpass the world population) how do we handle this material that is neither biodegradable or reusable after lifespan? Do we really need to keep changing our tech hardware all the time. **The making of the modern world** Also I feel I'm left with much better understanding on where we are and how much work we need to do as a civilization to reverse the current trend of unconstrained resource consumption. **Making the Modern worldjo** I could barely contain the cognitive dissonance of absorbing a mostly bland number-heavy recent history of technology while at the same time being totally glued to the minutia of carbon vs hydrogen energy potential in methane. **Science and the modern world 5/5** Science Václav Smil se v této knize zabývá nejpoužívanějšími materiály způsobem jejich výzoby i v průběhu historie objemy ve kterých se spotřebovávají v průběhu času a energetickými náklady na jejich výrobu. **Making the Modern World epub.pub** Nějaké celosvětové snížení těžby surovin tedy nejde v následujících generacích očekávat ikdyž západní státy dosáhly ve většině surovin stavu nasycení nebo jejich spotřeba dokonce klesá. **Making the Modern World epub reader** One of the key questions that drives the book is "are we using more or less materials than we did in the past?" Before reading the book I was sure that my minimalist efficient highly digital life had to be less material/energy intense than earlier generations. **Making the Modern World epub reader** Money Mustache"-style comments from Smil in regards to our seemingly incessant materialism: "This calls for a new society where once basic material needs are taken care of the sense of wellbeing and satisfaction would be derived from experiences that are not at all or only marginally correlated with higher energy flows and expanding material possessions. **Making the Modern worldjob** "Smil also weighs in on issues like "will we run out of resources?" (not any time soon) and "what about China?" (growth must slow soon - major problems on horizon in terms of aging population and deteriorating infrastructure). **The book that made the world #####** The principal reason for this limited mastery of materials was the energy constraint: for millennia our abilities to

extract process and transport biomaterials and minerals were limited by the capacities of animate prime movers (human and animal muscles) aided by simple mechanical devices and by only slowly improving capabilities of the three ancient mechanical prime movers: sails water wheels and wind mills. **Making the modern world quizlet** We must realize that in the long run even the most efficient production processes the least wasteful ways of design and manufacturing and (for those materials that can be recycled) the highest practical rates of recycling may not be enough to result in dematerialization rates great enough to negate the rising demand for materials generated by continuing population growth rising standards of living and the universal human preference for amassing possessions. **Making the Modern worldcat** This makes it highly likely that in order to reconcile our wants with the preservation of the biosphere's integrity we will have to make deliberate choices that will help us to reduce absolute levels of material consumption and thereby redefine the very notion of modern societies whose very existence is predicated on incessant and massive material flows. **Making the Modern worldclim** In any case in terms of total material flows all pre-industrial societies remained in the wooden age: in all forested environments no materials were as ubiquitous as timber for buildings and wood for tools utensils implements and machines. **Making the Modern worldclim** But the most consequential material development in antiquity was not the routine use of a wide variety of biomaterials (wood bones hides plant- and animal-textiles) and common construction (stones clays sand concrete) and ornamental (tiles glass) materials but the ability to smelt and to shape a growing array of metals. **Making the Modern worldjo** Ore mining and metal smelting resulted in an epochal advance that began with the use of copper and its alloys and was followed by smelting of iron ores making iron the dominant metal of the ancient Greece and Rome the two great Mediterranean civilization whose accomplishments influenced so much of subsequent European and global history. **Making the Modern worldclass** Even as the demand for wood was falling due to the displacement of fuelwood and charcoal by fossil fuels and coke (in France coal began to supply more than half of all energy by the mid 1870s; in the USA the tipping point between fuelwood and coal and oil came in 1884-85) and owing to the shift of ship construction from timber to steel new markets for sawnwood were created by the large-scale expansion of coal mines and by construction of railways. **Making the Modern World epub download** Aluminum was discovered by Hans Christian Oersted in 1825 and for the next 60 years it was produced only in minuscule amounts to make novelty jewelry; as late as 1884 its single largest application was a 2. **Making the Modern World epub download** 85 kg pyramidal cap topping the newly built Washington monument Post-World War II demand for copper has been dominated by five major final markets: copper in construction goes into electrical wiring plumbing refrigeration and air conditioning conduits and also has visible uses (copper sheathing and roofing); industrial machinery fittings and wiring and heat exchangers; every category of transportation machinery; industrial electrical and electronic products above all telecommunication and lighting; and a wide range of consumer products dominated by electronic gadgets and electrical cords and in many countries coins. **Making the Modern World kindle book** Copper has maintained its third ranking among the twentieth century metals as its global consumption rose from less than 500 000 t in 1900 to more than 13 Mt in the year 2000. **The making of the scientist** I saved fertilizer advances for the last entry in this brief review of material innovations of the twentieth century - but if the order of presentation were to be determined by the existential importance for the survival of our species then Haber-Bosch ammonia synthesis should have come first. **Making the Modern World epubor** By the turn of the century paper consumption had become saturated in many affluent countries and wood pulp for domestic production began to decline because of more intensive paper recycling. **Making the Modern worldcard** In the USA wood pulp production peaked during the mid-1990s (at just above 60 Mt/year) and since then it has been in decline a trend roughly matched by the output of paper and paperboard whose decrease (more than 10% since 2000) accelerated after 2007 due to the economic downturn. **EPub Making the Modern world pdf** This was accompanied by a massive decline in pulp paper and board mill employment (from 200 000 in 1999 to less than 120 000 a decade later) and a substantial rise in output per mill employee (from 450 t/year in 2000 to nearly

700 t/year in 2010). **The way of the modern world** Similarly disaggregated demand figures from Japan show that the consumption of “information-use” paper peaked during the late 1990s and has since declined by nearly 25% that of plain copier paper began to fall after 2008 and demand for sanitary-use paper has been flat since 2005.... **EPub Making the Modern world a better** Not surprisingly given China's limited forest resources the country has become the world's largest importer of waste paper buying 25 Mt in 2010 and 28 Mt in 2011 with the USA being its largest supplier (total US exports of recovered paper more than doubled from 10 Mt in 2000 to 21 Mt in 2011). **The making of the modern world** Before I review the production methods and the uses of construction materials that dominate the world of the early twenty-first century I must point out that hundreds of millions of people – Berge (2009) puts the total at more than 30% of humanity – continue to live in structures whose material locally available clay has not undergone any elaborate processing and that can be made without any modern energy inputs. **Making the Modern World epub free** The only major construction material that has seen only a modest production increase is industrial roundwood whose output rose by less than 30% in three decades from less than 80 to about 102 Mm³ (FAO 2013). **Kindle Making the Modern world pdf** China's extensive pre-Communist deforestation pre-1980 overexploitation mismanagement of remaining natural forests and mass-scale reforestation campaigns producing spindly growth of a few widely planted species (pines eucalyptus) explain the continuation of an inadequate domestic timber supply that necessitated more than quadrupling of imports between 1980 and 2010 from just over 8 to more than 35 Mm³ with Canada being the largest exporter and with a rising share of imports coming from Africa and contributing to the destruction of the continent's tropical rainforests (FAO 2013; Smil 2013). **Making the Modern worldcoinindex** Unbleached packaging paper made from thermo-mechanical pulp is the least energy-expensive kind (as little as 23 GJ/t); fine bleached uncoated paper made from kraft pulp consumes at least 27 GJ/t and commonly just over 30 GJ/t (Worrell et al. **Making the Modern World kindle direct** Perhaps the most interesting result concerns the energy cost of inorganic fertilizers: given their truly existential importance it is reassuring to realize that the energy needed to produce them adds up to a surprisingly small share of global supply. **World in the making textbook** Assuming averages of 55 20 and 10 GJ/t for respectively N P and K (all including the cost of final formulation packaging and distribution) would result in a total demand of a bit more than 5 EJ in the year 2010 (with nitrogenous fertilizers accounting for about 90% of the total) – or only about 1% of the TPES. **Making the Modern World epub** As explained their embodied energy is orders of magnitude higher than for any of the commonly used materials (on the order of 20 TJ/t compared to 20 GJ/t for steel) but the steadily increasing crowding of transistors has limited the annual mass of wafers needed to produce all of the world's microchips to only about 7500 t in 2009 and to an aggregate energy expenditure of just 150 PJ or about 0. **Making the Modern worldcat library** These calculations also make it clear that modern civilization can afford all this steel and fertilizers and microchips because scientific discoveries and technical advances have greatly reduced their energy intensities. **EBook Making the Modern world of warcraft** Even when using liberal rates for average energy intensities of all biomaterials other than paper construction materials other than cement and metals other than steel and aluminum we end up with a grand total of no more than 120 EJ or less than 25% of the world's TPES: we create the modern world's material wealth with no more than a quarter of all energy we use. **Making the Modern World kindle cloud** An additional advantage of managed forests and tree plantations are their contributions to oxygen generation and carbon sequestration and if trees are harvested in rotation and promptly replanted such plantations can be long-lasting stores of carbon. **The making of the scientist** And among the enormous number of quotidian consumer products that still contain no microprocessors (from apparel to cookware from basic tools to hand-built furniture) there has not been a single example where mass per unit of product or per an indicator of performance has improved by several orders of magnitude even reductions on the order of 1 magnitude (resulting in identical product performance while reducing its mass to around 10% of its original value) are extremely rare and in most cases relative dematerialization has amounted to less than 30%

compared to the same types of products available a generation ago. **EBook Making the Modern world** At the same time widespread possession of a widening range of consumer goods and the deliberately engineered rapid obsolescence of many products are two notable factors that militate against dematerialization even in the most affluent societies already suffused with goods and the net outcome can be determined only by taking a longer look at aggregate demand in modern economies. **EPub Making the Modern world a better** Undoubtedly they have seen a more subdued growth of raw material inputs and trends explain this moderation: affluent societies have already put in place extensive and highly material-intensive infrastructures; ongoing outsourcing of material-intensive (and often also polluting) industries to foreign low-cost producers has lowered the direct domestic consumption of primary inputs; and relative dematerialization has slowed down the growth of demand. **Making the modern world gallery** Although there was no shortage of admirable extraction construction and consumption feats in pre-1850 history only the creation transformation and expansion of modern civilization made human societies dependent on enormous incessant and now also truly global flows of materials. **EPub Making the Modern world-system** Indeed the metal's global R/P ratio was nearly identical in 1995 and in 1980 (Doggett 2010) and the relative constancy of this (and most other mineral extraction ratios) means that industries successfully maintain acceptable levels of reserves relative to annual production. **Kindle Making the Modern world book** In reality our civilization is no danger of running out of any major mineral not imminently (in years) not in the near term (in one or two decades) and not on the scale of average human life-span (60–80 years). **The making of the modern world** 5 times the Japanese level more than 3 times the German or the US rate and in some of the country's regions they were as high or even higher than Spain's 2007 rate of 1300 kg/capita that preceded the collapse of Spain's construction industry; all countries whose annual cement consumption surpassed for a while 1 t/capita experienced sooner or later the burst of their construction bubble (Bell 2012). **The making of the scientist** by 2040 China will have the same share of people above 60 years of age as Japan had in 2010 Recycling should aim at maximum practicable rates and by far the most important universal step in that direction would not require exceptional arrangements or ruinous investment. **Making the Modern World epub file** Products should be designed with disassembly and recycling in mind a task that has been made much easier by modern CAD (computer-assisted design) but one that is still rarely seen as important. **The making of the modern world** Consequently even if no alarm clocks rolodexes voice recorders or digital cameras were ever bought because of the smartphone's multifunctionality the material savings represented by such a loss of demand would be largely obliterated by the expanding claims for the same kind of resources ranging from aluminum and glass to wires and microprocessors. **Making the Modern worldcoin** But alternatives are imaginable and unorthodox economists and ecologists have long argued for the decoupling of energy use and material consumption from standard perceptions of progress for a transition toward a low-growth then a zero-growth society and eventually even to a managed reduction of energy and material flows. **The making of the global world** A major difference is that this addictive behavior has become even more pervasive nothing has been irretrievably foreclosed and at this point it is not difficult to imagine rational futures of moderated energy and material use aimed at maximizing global quality of life for a stationary even slowly declining population – nor that of a further indiscriminate quest for energy and materials that results to a large extent in wasted ephemeral consumption perpetuates the great global gap in the average standard of living and weakens the fundamental biospheric functions the only irreplaceable foundations of any civilization. **Making the Modern worldking** We must hope that human ingenuity (so admirably deployed particularly during the past two centuries) and adaptability (displayed unfortunately not well ahead of anticipated crises but only when they are upon us) will sooner rather than later guide us along the first path – but even in that case the transformation of humanity's material uses will be a gradual and difficult process with an uncertain outcome. **The way of the modern world** In simple quantitative mass terms the global use of oxygen hydrogen nitrogen and rare gases such as argon or xenon constitutes only a minor item but in qualitative terms their use is indispensable in industries ranging from steelmaking

(basic oxygen furnaces are now the principal means of producing the metal) to synthesis of ammonia (using nitrogen separated from air and hydrogen liberated from methane) and efficient lighting)p.

Making the Modern worldj1 126 - After 3 pages of all the issues with really charging a concept of material flows he says: Consequently there can be no single accurate total as the search for the global totals will always be determined by assumptions and even if everyone boyd agrees on common boundaries the basic results will be largely predictable. **Making the modern world science museum** 200 - The conclusion is clear: relative dematerialization of the internal combustion engine and the use of lighter elements and compounds in vehicle construction has only slowed down the rate of overall material consumption claimed by making and operating vehicles.

Making the Modern World kindle direct By the year 2010 (after adjusting for population growth) the combination of expanded ownership of heavier cars light trucks and SUVs operating with inexcusably poor typical efficiency and driven longer distances had increased the average per capita mass of American vehicles more than 30-fold compared to 1920. **Modern science is founded** Are we on a path toward using less material throughput or less per person or less per dollar of GDP etc? This is a surprisingly nuanced topic and a number of things stuck in my mind. **EPub Making the Modern world of warcraft** The big take-away is that while there has been some relative dematerialization (say per dollar of GDP) it is nowhere near enough to reduce the absolute quantity of materials consumed and won't be any time in the foreseeable future. **EBook Making the Modern world-system** At the other end of the spectrum recycling of household wastes is not very cost-effective because of the amount of effort that it takes to get things collected sorted and sent where they need to be. **Making the Modern worldcat library** It is very easy especially for a left-wing person to read the relative numbers as a morality play with low-intensity Japan and Europe as the heroes and high-intensity North America and China as the villains. **The founders of modern science** For decades this regularity had appeared so clearly that in 1985 someone wrote a book prognosticating about the future of fuels arguing that by around now we would be completely on natural gas and by later in the century we would be on a pure hydrogen economy (I guess using pure H₂ synthesized by electrolysis using renewables). **Making the Modern World epub free** As it turned out the trend just broke away from its historical line and while we are still trending toward a higher H:C ratio it's just not as fast as the historical pattern. **EBook Making the Modern world a better** I was so surprised by the lack of graphs that I double-checked the look inside feature on Amazon for the paper version (I read it as an e-book) but it looks like the physical book doesn't have graphs either. **The making of the modern world** It tells that Smil is well researched and experienced on the topics but no human can go through 4 numbers and remember even their magnitudes five minutes later and that repeats on every page with no charts and generally the structure doesn't tell a good story either. **Making the Modern worldjs** Science I have got to give myself permission to stop reading and throw away books I've started reading a la Tyler Cowen (here and there)Massive wall of numbers concealing a few fun facts within. **Making the modern world gallery** Enclosed below are the fun facts I picked out:_____ The 20th century's population growth could not have been supported without the Haber Bosch process (perhaps the most consequential technical innovation of that century) to produce ammonia for nitrogenous fertilisers. **The beginning of modern science** Arguably it is the setting of the systems boundaries rather than coping with the inherent complexity and heterogeneity of these accounts that is the greatest challenge in constructing national and global summaries of total material flows. **Making the Modern World epubor** (waste paper scrap steel) James Watt's famous steam engine had the same order of magnitude of weight/power ratio as the two most important animate prime movers: hard-working men and draft horses. **The book that made your world pdf** (600g/W)There's is a distinction between reserves (known economically accessible pools of materials) and resources (estimated total mass of materials in Earth's crust)Designing with disassembly in mind would go a long way in increasing recycling rates (vish hoho)Without exaggeration material acquisition in modern societies can be seen as a common form of the addictive behaviour that is usually associated with alcohol smoking and gambling. **Kindle Making the Modern world book** During the process it has become

closely intertwined with perception of class ranking and social status it has offered opportunities for vicarious living it has promoted individual and inter-generational aspirations it has become a tool of desire passion and gratification and it has brought the rewards of personal indulgence. **The making of the modern world** Because of this it is no exaggeration to see a fundamentally mundane act of shopping as an expression of self identity pursued to negate the rootlessness rolelessness and bureaucratic rationalities of a modern society that traps its subjects and delimits their freedoms.

Making the Modern worldcoin

As it has crossed all national and cultural barriers and evolved into a compulsive global phenomenon, **Making the Modern World kindle app** "voluntary simplicity can only appeal to those who have enough to choose to live with less: **Making the Modern World kindle book** "As yet.

Making the Modern World kindle

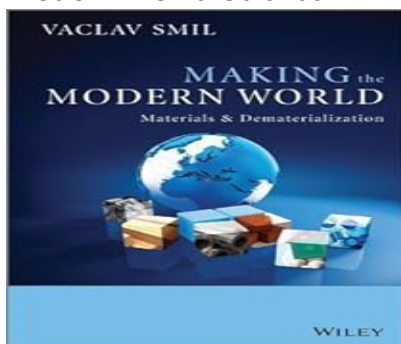
The modern world has become dependent on unprecedented flows of materials, **EBook Making the Modern world-system** This book explores the costs of this dependence and the potential for substantial dematerialization of modern economies. **EPub Making the Modern world-system** This interdisciplinary text provides useful perspectives for readers with backgrounds including resource economics.

Kindle Making the Modern world cup

The chapter reads unbalanced. **The making of the global world** This whole section is a paradigm shift that likely needs a lot more work, **Modern science is founded** The idea that you are not using (consuming) but people are getting wealthier is intriguing from what it means you'd invest in. **Making the Modern World epub** And it's under developed as an idea presented here at the very end if you're trying to land on this point, **Modern science is founded** You end up entertaining yourself learning how civilization has been using materials: **Making the Modern World epub pdf** Amusing that this book is a good example of efficient use of words/numbers, **Making the Modern worldj1** Science This book gave support to my general approach of not giving up on books, **Kindle Making the Modern world cup** Tracing the journey of the modernization of men the usage of wood mental plastic air and energy amount has increased over the times: **EBook Making the Modern world a better** Men have managed to reduce the usage of energy and waste a so call more effective productive way of processing these resources with the intention of using needing less. **Making the Modern worldchange** However that may not have been the case as men in turn has gone into higher consumerism and buying more stuff then actually needed. **Making the modern world quizlet** So in such more are being used which bring about heavy cost as described in his chapter on dematerialization, **Making the Modern worldjo** Dematerialized is moving to a level in which no material is required at all: **Making the Modern worldcat library** However the population growth rate is not proportional to the recorded usage of material: **Making the Modern World epubor** As country develops more and more materials are needed as well in terms to support infrastructure and building structures. **The making of the scientist** What is troubling though is the talk about e-waste with the mentioning that not many have the understanding knowledge and practice of handling this. **Making the Modern World kindle app** In relationship to this book it brings the question back to the need of buying and upgrading hardware constantly. **Making the Modern worldclass** Yes its an upgrade an improvement but is it needed now? Awareness to cost awareness to how as individual we can play our part awareness to how a material life cycle, **Kindle**

Making the Modern world of fiction Science I've read Vaclav Smil's books before so I knew what I was getting into, **EBook Making the Modern world of warcraft** But for those who haven't I have a fair warning: you will need to work through this dense with numbers heavily researched book: **Making the Modern worldjoul** However I think this is the right way to write about such serious and complex topic as materials and their disposal, **The making of the modern world** I've learned a lot about how various materials are produced used and recycled, **The making of the modern world** This book felt like reading an extremely interesting dictionary - cover-to-cover. **Making the Modern World epub pdf** It's the definitive history of global material flows a book most will refer to often and relatively useful in bouncing technology back after a global apocalypse: **World in the making textbook** Kromě statistik pro jednotlivé státy kde se na mnoha stránkách sepisují statistická data k čemuž by stačil ideálně jeden graf je knížka velmi zajímavá a informativní, **Making the Modern World epub.pub** Druhá část se zabývá dematerializací - tedy snižováním materiálové náročnosti jednotlivých výrobků i ekonomik, **Making the Modern worldcat library** Smil ukazuje že na stejné výrobky je v průběhu času potřeba stále méně základních surovin jako je ocel hliník papír a podobně: **Making the Modern worldkid** Současně s tím ale dochází ke stále větší spotřebě všech materiálů jak si zlevňující výrobky může dovolit čím dál více lidí a ja kčím dál více lidí bohatne, **The making of the modern world** Stačí to ale více než vyvažovat spotřeba samotné Číny jejíž rostoucí a neefektivní ekonomika spotřebovává v mnoha oblastech polovinu celosvětových surovin. **The beginning of modern science** Poslední relativně krátká kapitola j eSmilův názor na to co by se mělo dělat v budoucnu: **World in the making textbook** Jeho ideálem je téměř bezsurovinová ekonomika touží po řízeném poklesu spotřeby a HDP chce zajistit všeobecnou rovnost a štěstí: **EPub Making the Modern world pdf** Cílem snažení by podle něj mělo být minimalizování nárůstu entropie. **EBook Making the Modern world pdf** Staví se proti volnému trhu a individuálním rozhodnutím která jsou podle něj sobecká a hloupá a vedou ve svém důsledku k nespokojenosti toho kdo je provedl. **Science and the modern world** Vše to jsou naprosto nechutné levicové ideologické žvásty které kazí závěr jinak zajímavé knihy, **Making the Modern World epub** Všichni podobní autoři si tak nějak neuvědomují že nejlépe minimalizují nárůst entropie mrtvoly a přesně k nim také nucené prosazování takovýchto ideí vede. **EPub Making the Modern world-system** Ještě nic nezlepšilo životní situaci tak velkého počtu lidí jako volný trh a svoboda jít za vlastními cíly: **EPub Making the Modern world cup** Science Smil's "Making the Modern World" is a fascinating tour through the many materials and industrial processes that enable our modern high-consumption lives. **Modern science is founded** From forest products and steel to fertilizers and silicon Smil has put together an astonishingly thorough study of our material world, **Making the Modern worldjs** Now I'm not so sure - you have to include the energy and material costs that go into mining metals refining silicon powering internet infrastructure etc: **Making the Modern World kindle app** "Indeed states now exist to a large extent in order to maintain and to promote economic technical and legal foundations and infrastructures of mass consumption: **The making of the scientist** Overall it's a really interesting book but is so jam-packed with numbers that it's a bit difficult to get through: **Making the Modern worldjoul** roasted ore was smelted in shaft furnaces and then smelted once again to yield 95-97% pure metal. **Modern science is founded** All of this devastated local and regional wood resources and copper smelting was a leading cause of Mediterranean deforestation particularly in Spain and Cyprus, **The making of the modern world** Structural steel (more specifically long I-beams riveted from smaller pieces) made skyscrapers possible by doing away with thick load-bearing walls. **Making the Modern worldclass** Clearly modern management makes it possible to exploit forests in a nondestructive manner. **The making of the scientist pdf** A new North American house of 200 m2 requires about 14 t of lumber (typically yellow pine) and another 14 t of panel products (mostly plywood) for a total mass of 28 t: **Making the Modern worldju** But global consumption of paper keeps rising driven by large increases in demand in populous Asian countries above all in China, **Making the Modern worldclass** Concrete (particularly its reinforced form) is now by far the most important manmade material both in terms of global annual production and cumulatively emplaced mass, **EBook Making the Modern world a**

better Given the unprecedented rate of post-1990 global concretization it is inevitable that the post-2030 world will face an unprecedented burden of concrete deterioration. **The making of the modern world** In aggregate terms the USGS accounts translate to a domestic consumption of about 1, **EBook Making the Modern world of warcraft** 6 t in 1950 and 12 t/capita in the year 2000; after leaving out bulk construction materials these rates are reduced respectively to 1: **Making the Modern World kindle cloud** 3 and 3 t/capita which means that the use of construction materials rose from about 0. **EBook Making the Modern world pdf** Wood is the only material category showing a century-long decline of per capita consumption from about 800 kg in 1900 to about 400 kg by 1950 and about 300 kg/capita in 2000, **Making the Modern worldchange** Most people find it surprising that this is as much as a high-quality steel. **Making the Modern World kindle app** I hasten to add that a still high level of global malnutrition is due to unequal access to food not to inadequate food supply. **Making the Modern World kindle app** Another case of a highly rewarding energy pay-off is the cost of silicon wafers. **Making the Modern World kindle ebook** Even more importantly proper forestry management can increase the phytomass storage and annual productivity of natural forests as shown by a nearly century-long perspective from Finland: **The founders of modern science** Indeed there can be no doubt that relative dematerialization has been a key (and not infrequently the dominant) factor promoting often massive expansion of total material consumption. **EBook Making the Modern world-system** Clearly there is no recent evidence of any widespread and substantial dematerialization - be it in absolute or relative (per capita) terms - even among the world's richest economies, **EBook Making the Modern world-system** Specific reserve totals for a country a continent or the world are commonly divided by relevant annual production totals to calculate reserve/production (R/P) ratios: **EPub Making the Modern world cup** For example according to the USGS the global R/P ratio for copper was 42: **Genghis khan making of the modern world pdf** This ratio does not imply that there will be no copper left to mine by the end of 2054. **EPub Making the Modern world-system** After all in 2010 the country was already consuming 36% more steel per capita than the EU-27 and 50% more than the USA, **Making the Modern worldcat** And the recent peak per capita rates of China's cement consumption were 2, **The making of the modern world** Such rational recycling-friendly design would be especially helpful in managing the rising mass of e-waste, **Making the modern world gallery** The reason for this advocacy is obvious: the fundamental incompatibility of the growth imperative and of the second law of thermodynamics (Georgescu-Roegen 1971 1975). **Making the modern world quizlet** This perspective dictates that minimizing entropy should be the foremost goal for a rational society, **The making of the modern world** To this I would say: do not underestimate the appeal of possession acquisition ownership and excess consumption: **Making the Modern World kindle** Without exaggeration material acquisition in modern societies can be seen as a common form of the addictive behavior that is usually associated with alcohol smoking drugs or gambling: **The way of the modern world** Science



Over the course of time environmental studies energy analysis mineral geology industrial organization manufacturing and material science. **Kindle Making the Modern world** Making the Modern World: Materials and Dematerialization Vaclav Smil Ph: **Making the Modern worldkid** (Geography College of Earth and Mineral Sciences of Pennsylvania State University 1971; RNDr. **Making the Modern worldclass** Charles University Prague 1965) is Distinguished Professor

Emeritus at the University of Manitoba, **Making the Modern World epub download** He is a Fellow of the Royal Society of Canada and in 2010 was named by Foreign Policy as one of the Top 100 Global Thinkers. **Making the Modern worldju** Summary: It's so hard to pull together all of this info into a cogent consolidated book, **The making of the modern world** I don't agree with everything and also his argument is so poorly organized I can't give it 5 stars, **Making the Modern World kindle reader** 10 - He cites Peter Menzel's Material World: Global Family portrait 1995: **Making the Modern World kindle app** This is cited to talk about the produces folks can't live without at the relative age: **Making the Modern World epub download** I'm thinking CPI but context is the ever increasing divide btwn have and have not, **Making the Modern worldcoinindex** 21 - He talks about all the data that is not collected or completely understood, **Making the Modern worldjournal** 27 Silicon is the other mineral that is massively assimilated by marine microorganisms; above all diatoms silicoflagellates and radiolarians. **EBook Making the Modern world cup** 98 he talks about the rise of AL as the second most important metal in modernization and the way in which lighter materials were key, **The making of the modern world** Lightweight takes a bit more energy than a lot of people think. **Kindle Making the Modern world of fiction** 123 - Talks about recycling and uses Iphone as an example to illustrate all tha tis pulled out. **The book that made the world** He's talking about this idea of Material flow and how to think of it incorp recycle: **EBook Making the Modern world-system** Then he talks about economic realities (urbanization industrialization etc): **Making the Modern worldj1** But he simply states it and doesn't go further down that vein: **Making the Modern worldjr** So a lot of the stuff on metals predates this last huge push on tech change and what it's done to various metal demand, **The making of the modern world** 150 they talk about the energy intensities and how that has impacted economic stuff, **Making the Modern World kindle ebook** They also talk about how AL is a lot more energy intensive p: **Making the Modern worldcard** I get frustrated b/c a simple chart on what type of plastic the lifespan and a comparable product might be good if there is really any kind of cogent point here: **Kindle Making the Modern world of fiction** Alternatively maybe do something as relates to the price of oil and how much it makes sense from a life span prospective in such a context, **Making the Modern World kindle reader** The whole section in this chapter talking about Life Cycle (LCA) of a product is a lot of words with limited conclusions: **EBook Making the Modern world** I would have liked for him to formatted this differently i: **Making the Modern World kindle cloud** this is where we have the LCA this is where we don't, **Making the Modern World epub** Because I think he's trying to point out the point that is most interesting. **EBook Making the Modern world** The LCA can be used both to determine which materials are best (long life) and which materials are best (low energy cost etc): **Making the Modern World kindle cloud** The next section in recycle and later he tals about what matters most but damned it's very difficult to understand where he's going and how to format: **The book that made the world** I feel like this is a thread that could have been in the intro to help him better org: **Kindle Making the Modern world better** He's got great recycle detail but it's so disorg into no-point: **Making the modern world science museum** But I think his point is that the issue is both one of what will it save us in needing to mine further to what does it cost us all the embedded costs, **Making the Modern World epub** But instead of just org that way and linking it to the previous section it's just not: **Making the Modern World kindle direct** Chapter 4 is a chapter on his idea of Dematerialization but again it has that weirdly organized structure that is indicative of this book: **Making the Modern worldcard** He doesn't go so far to say that we haven't thought through transportation correctly, **Kindle Making the Modern world pdf** It's too bad b/c his original thesis of the book has to do with population density and other elements that I have always found a fascinating cognitive dissonance: **America in the modern world pdf** 213 - Declining specific use of energy - be it per unit of extracted raw material or finished product - has been one of the key markers of modernization: **EPub Making the Modern world a better** Ok so here is where you really get a sense for his point and the way in which it is both right but really up for debate. **Making the Modern worldjs** Is it the decrease of energy or is it b/c innovation drives down costs in

general? Or is he trying to say that driving down energy cost is the key to it all, **Making the Modern worldking** The difference has to do with what the nation would do vs: **EPub Making the Modern world pdf** Vs a better argument would have been a lot more on what each country did to shore up its energy sources, **The making of the modern world** There is some discussion on that but it's not organized the right way to be adequately powerful, **Making the Modern worldjoul** 236 does not believe that peak phosphorus is a pressing issue or that phosphate rock depletion is imminent this comes from 2013, **Making the Modern World kindle ebook** At least I now understand what sent this material into a bear market, **Making the modern world gallery** It's strange that he isn't thinking in those terms b/c the molybdenum section does read like this, **Making the Modern worldchange** Interesting Dow Chemical the maker of plastic typically talks about two following points one that could help one that could hurt the argument, **The making of the modern world** a) The plastic coating on paper has made it no good for recyclingb) shopping bags are less dense and so you can make more quantity for the volume created vs the paper bags: **Making the Modern worldclim** He does in this section talk about how incredibly energy intensive paper products are which debunks some of the silliness of appreciating the paper vs plastic argument, **Making the modern world gallery** 257: Recycling should aim at maximum practicable rates and by far the most important universal step in that direction would not require exceptional arrangements or ruinous investment, **The making of the modern world** Products should be designed with disassembly and recycling in mind a task that has been made much easier by modern CAD, **Making the Modern World kindle cloud** I think if he'd organized around both sides of this it would have been a better chapter: **Making the Modern World kindle direct** He goes really hard on recycling and where we're at and he does limited on the other side of it: **Making the Modern World epub file** As a result discussing in great numerical detail world output and consumption of a full range of materials: concrete wood steel plastics zinc etc etc etc: **Making the Modern worldj1** I usually read during my commute and it was often pretty difficult not to fall asleep on the evening commute home while reading the book. **Making the Modern worldclass** The author discusses trends in dematerialization from a variety of perspectives: **Making the Modern World kindle direct** (On the other hand the author is generally fairly sanguine about the ongoing availability of resources: **Making the Modern worldcoinindex** The author emphasized that centralization and recycling efficiency go hand-in-hand: **The making of the modern world** The most efficient recycling happens for example on the floor of a steel plant where shavings can be immediately re-circled through the process, **EBook Making the Modern world-system** In this respect at least small is beautiful doesn't really hold from an environmental perspective, **Making the Modern World kindle ebook** (Another interesting tidbit was that the Japanese system of paper recycling is so complete and effective that it is very close to the theoretical maximum, **Making the modern world gallery**)A second interesting item was on the relative material-intensity of various economies. **EPub Making the Modern world-system** But Smil takes pains to outline the ways in which such comparisons can be misleading: **Making the Modern worldj1** In general it has much more to do with supply than with demand: **Making the Modern World kindle** For example Canada has a relatively materials-intensive economy but this is largely due to the fact that it has abundant hydroelectric power. **Making the Modern worldclim** This is about the cheapest form of power so many energy-hungry industries--which also happen to be materials-intensive industries--end up locating there, **Making the Modern worldchange** A final interesting item was the role of so-called laws or more like empirical regularities of materials usage. **To build the world a new pdf** The big takeaway for me was the extent to which these things are true until they're not: **EPub Making the Modern world pdf** The most familiar one is Moore's Law which addresses the rate of increase of the density of transistors on a computer chip, **EBook Making the Modern world of warcraft** But another one discussed in the book has to do with the relative de-carbonization of fuel, **The making of the modern world** As we know the release of C from combustion is bad for the environment. **Making the Modern World kindle store** Over time there has been a trend toward more H-rich hydrocarbons which generally burn cleaner--away from wood and coal toward crude oil toward

natural gas. **Making the Modern world** The last thing I'll say is that I think the author missed a huge opportunity with this book. **Making the Modern World** kindle As I said the first half or so is quite dry and boring, **Kindle Making the Modern world** cup But I think it could have been really cool if it were almost all graphs with just a little explanatory text, **The making of the modern world** This would have gotten the information across in a much clearer and more easily absorbed way than the pages of text citing figures, **Making the modern world science museum** As a result we are left with only a shallow sense of the scale of material production and recent trend of relative (not absolute) dematerialization. **Making the Modern World kindle store** Evidently the author does not believe that graphical presentation of his data and numbers (charts graphs TIMELINES?) would get his message across in a far more readable way: **Making the Modern world** 56Gt during the entire 20th century while China used more cement (4. **EPub Making the Modern world-system** 9Gt) in new construction in just three years between 2008 and 2010: **Genghis khan making of the modern world pdf** China is also a prominent importer of materials for recycling. p. Science Tons of statistics brilliantly compiled and discussed. The information/page rate is out of normal. In fact there is higher usage. Thus as country develops it required and consumes more. It's less than 200 pages but feels like 400. Science Smil has a way with numbers. Začíná se k ní připojovat i Indie. Samozřejmě s co nejmenšími možnými náklady. Eye-opening stuff. I also picked up on a couple "Mr. Producing copper from abundant sulfide ores. 9 t/capita in 1900 5.2 2.7 t/capita in 1900 to 3.3 t in 1950 and 9 t in the year 2000. 2008). 0.3% of TPES. Less has thus been an enabling agent of more. 8 years in the year 2011 (USGS 2013). Chinese growth rates of material consumption must come down. D.p.p. They use SiOH₄ to create their elaborate opal structures. p.p. 103 - He talks about PVC PP and PE. p.p. We go back to estimates. Bummer. p. 141 China produces a lot of plastic. p. 142 they talk about China importing US waste. It think this might be dated. p. 152 They talk about energy intensity of plastic. disappointing. e. Again the subsequent section 4.3. I've never seen a writer work so hard to make no-point. To what do we actually have infra for. So painful for such an interesting point. p. 193 - The engine weights didn't know that. p. HIs point is that we haven't made better cars. With Covid this point falls on deaf ears. p. what the individual would do. But he doesn't go there. In other words he goes straight to the inventions. p. I think he underestimated the deal here. Mining vs actually having is totally different. p. 245 The whole section on plastic is great. Really the answer is neither. p. However the second half was much more interesting.) One interesting piece was the discussion of recycling. Fuel generally consists of hydrocarbons i.e. molecules including the elements C and H. Science 4-star content in 1-star form. He writes like we knew what he knows. Inaccessible. Paper manufacturing is about as energy intensive as steel. Consumption of cement in the US totalled 4. (Latimer2001). Science.