

Vaclav Smil: ‘Growth must end. Our economist friends don’t seem to realise that’

[Jonathan Watts](#)

The scientist and author on his latest book – an epic, multidisciplinary analysis of growth – and why humanity’s endless expansion must stop.



Vaclav Smil: ‘People ask me if I am an optimist or a pessimist and I say neither.’ Photograph: David Lipnowski
[@jonathanwatts](#)

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[Vaclav Smil](#) is a distinguished professor emeritus in the faculty of environment at the University of Manitoba in Winnipeg, Canada. Over more than 40 years, his books on the environment, population, food and energy have steadily grown in influence. He is now seen as one of the world’s foremost thinkers on development history and a master of statistical analysis. [Bill Gates says](#) he waits for new Smil books the way some people wait for the next *Star Wars* movie. The latest is [Growth: From Microorganisms to Megacities](#).

You are the nerd’s nerd. There is perhaps no other academic who paints pictures with numbers like you. You dug up the astonishing statistic that China has [poured more cement every three years since 2003 than the US managed in the entire 20th century](#). You calculated that in 2000, the dry mass of all the humans in the world was [125m metric tonnes](#) compared with just 10m tonnes for all wild vertebrates. And now you explore patterns of growth, from the healthy development of forests and brains to the unhealthy increase in obesity and carbon dioxide in the atmosphere. Before we get into those deeper issues, can I ask if you see yourself as a nerd?

Not at all. I’m just an old-fashioned scientist describing the world and the lay of the land as it is. That’s all there is to it. It’s not good enough just to say life is better or the trains are faster. You have to bring in the numbers. This book is an exercise in buttressing what I have to say with numbers so people see these are the facts and they are difficult to dispute.

Growth is a huge book – almost 200,000 words that synthesise many of your other studies, ranging across the world and exploring far into the past and future. Do you see this as your magnum opus?

I have deliberately set out to write the megabook on growth. In a way, it's unwieldy and unreasonable. People can take any number of books out of it – economists can read about the growth of GDP and population; biologists can read about the growth of organisms and human bodies. But I wanted to put it all together under one roof so people could see how these things are inevitably connected and how it all shares one crystal clarity: that growth must come to an end. Our economist friends don't seem to realise that.



The Three Gorges Dam on the Yangtze river in China. Photograph: Laoma/Alamy

I first came across your work while I was writing a book about the Chinese environment. Time and again, you had the data that I was looking for – and it often revealed how dubious many of the official statistics were. You have been described as a “slayer of bullshit”. Is that your goal?

I was brought up in Czechoslovakia during the era of the Soviet bloc. Having spent 26 years of my life in the evil empire, I do not tolerate nonsense. I grew up surrounded by commie propaganda – the bright tomorrow, the great future of mankind – so I'm as critical as they come. It's not my opinion. These are the facts. I don't write opinion pieces. I write things that are totally underlined by facts.

You debunk overly rosy projections by techno-optimists, who say we can solve all our problems with smarter computers, and economists, who promise endless capitalist growth. In many countries, the downside of material growth now seems greater than the upside, which leads to what you call “anthropogenic insults to ecosystems”. Is that a fair summary?

Yes, I think so. Without a biosphere in a good shape, there is no life on the planet. It's very simple. That's all you need to know. The economists will tell you we can decouple growth from material consumption, but that is total nonsense. The options are quite clear from the historical evidence. If you don't manage decline, then you succumb to it and you are gone. The best hope is that you find some way to manage it. We are in a better position to do that now than we were 50 or 100 years ago, because our knowledge is much vaster. If we sit down, we can come up with something. It won't be painless, but we can come up with ways to minimise that pain.

So we need to change our expectations of GDP growth?

Yes, the simple fact is that however you define happiness, we know – and we have known this for ages – that the amount of GDP is not going to improve your satisfaction with life, equanimity and sense of wellbeing. Look at Japan. They are pretty rich but they are among the unhappiest people on the planet. Then who is always in the top 10 of the happiest people? It is the Philippines, which is much poorer and smitten by typhoons, yet many times more happy than their neighbours in Japan. Once you reach a certain point, the benefits of GDP growth start to level off in terms of mortality, nutrition and education.

Is that point the golden mean? Is that what we should be aiming for rather than pushing until growth becomes malign, cancerous, obese and environmentally destructive?

Exactly. That would be nice. We could halve our energy and material consumption and this would put us back around the level of the 1960s. We could cut down without losing anything important. Life wasn't horrible in 1960s or 70s Europe. People from Copenhagen would no longer be able to fly to Singapore for a three-day visit, but so what? Not much is going to happen to their lives. People don't realise how much slack in the system we have.

The growth of information is not just a flood or an explosion. Those adjectives are inadequate. We are buried under information. It's not doing anyone any good

You cite Kenneth Boulding's distinction between the "cowboy economy" and the "spaceman economy". The former is wide-open spaces and seemingly endless opportunities for resource consumption. The latter is a recognition that planet Earth is more like a closed spaceship on which we need to carefully manage our resources. The challenge is to shift from one way of thinking to another. But human history is thousands of years of cowboys and only a few decades of spacemen. Aren't we hardwired?

There is a deep tradition both in the eastern and western traditions of frugality, living within your means and a contemplative life. It has always been like this. Now there is this louder voice calling for more consumption and a bigger bathroom and an SUV, but it's increasingly apparent that cannot go on. It will be something like smoking, which was everywhere 50 years ago. But now that people realise the clear link to lung cancer, this is restricted. The same will happen when people realise where material growth is taking us. It is a matter of time I think.

How do we move in that direction before the risks become unmanageable?

To answer this, it's important not to talk in global terms. There will be many approaches which have to be tailored and targeted to each different audience. There is this pernicious idea by this [Thomas] Friedman guy that the world is flat and everything is now the same, so what works in one place can work for everyone. But that's totally wrong. For example, Denmark has nothing in common with Nigeria. What you do in each place will be different. What we need in Nigeria is more food, more growth. In Philippines we need a little more of it. And in Canada and Sweden, we need less of it. We have to look at it from different points of view. In some places we have to foster what economists call de-growth. In other places, we have to foster growth.

Your one-man statistical analysis is like the entire output of the World Bank. Did this research make you feel we are closer to the end of growth than you previously realised?

People ask me if I am an optimist or a pessimist and I say neither. I am not trying to be deliberately agnostic: this is the best conclusion I can come up with. In China, I told people how bad the environment was and the picture totally shocked people. They said: "When will it collapse?" And I'd answer: "It's collapsing every day, but it's also being fixed every day." They used more coal and got more air pollution, but they also took billions from the World Bank and finally have modern water treatment in big cities. Now they are using modern farming, so they use less water for irrigation. This is how it is. This is what kind of species we are: we are stupid, we are negligent, we are tardy. But on the other hand, we are adaptable, we are smart and even as things are falling apart, we are trying to stitch them together. But the most difficult thing is to calculate the net effect. Are we up or down? For all the analysis, we don't know this.

Your book notes that the entire library of Rome, 2,000 years ago, contained about 3 gigabytes of information, but now the global internet has more than a trillion times more. You are clearly sceptical this has been a net positive or that it has improved our ability to deal with our problems.

The growth of information is not just a flood or an explosion. Those adjectives are inadequate. We are buried under information. It's not doing anyone any good. There are satellites above us producing huge amounts of information, but there are not enough people to analyse it. Yes, computers can help and shrink the amount, but someone still has to make decisions. There is too much to grasp.

Did you experience any statgasms (statistical orgasms) in the course of the research?

I am a biologist by training, so I was delighted to read new studies about the world's biggest trees – the redwoods and eucalyptus. They never stop growing. And for elephants, they have indeterminate patterns of growth and never really stop until they die. We humans stop when we are 18 or 19. But the biggest species on the planet keep on growing until they die.

And on human population?

What is most remarkable is how rapid the decline has been. For more than a 100 years, the growth rate accelerated. The 1930s faster than the 20s, the 40s faster than the 30s and so on. By the 1960s, the world population was growing so fast that a famous paper in Science said that by 2024, it would be growing at an infinite rate – like a population singularity moment, which is, of course, absurd. Since then, the rate has declined every year. [Population](#) continues to grow in absolute terms, but in percentage terms it has been declining since the mid-60s.



The US far outstrips other countries in terms of energy consumption. Photograph: Saul Loeb/AFP/Getty Images

Overall, I would say the tone of the book is pessimistic, but you also mention the possibility of a more optimistic scenario in which the global population does not expand beyond 9 billion – as is currently predicted – and in which the energy transition is faster than expected. Even if material demands peak before 2050, that still leaves us several decades of rising pressure. Given the already apparent strains on the climate, the soil, biodiversity and social stability, how do we get over this dangerous bulge?

That is the difficult part. In the western world and Japan, we are almost there. China still has a way to go because it is at the level of Spain in the 1960s in terms of energy. The real bulge is coming in Africa, where 1 billion more people will be born. Just to bring the current African population to a decent level of living, like Vietnam and Thailand, is tough. To do that with an extra billion will be extraordinarily hard. You can bring it all down to one figure – it is gigajoules of consumption of energy per person per year, but the unit is not important. Just consider the comparison. The US is about 300. Japan is about 170. The EU is about 150. China is now close to 100. India is 20. Nigeria is 5. Ethiopia is 2. To grow from Nigeria to China is a 20-fold increase just on per capita terms. Such is the scale of the bulge. So you can cut consumption in Copenhagen or Sussex, but not in Nigeria.

Is ageing Japan a model? It strikes me as incredible that the country has been able to weather a long decline of property prices, stock market values, population vitality and influence without sliding into chaos. Are there lessons there for others who face involuntary retreat?

Japan can only be a partial model, because until recently it was such a frugal and disciplined society that people there can tolerate what others would not accept. But we have slack. We are so fat in terms of material consumption. There is room to cut back. But there is no easy answer. If there were, we would have already done it.

Can businessmen accept an end to growth? Have you mentioned this to [Bill Gates](#)?

I don't need to tell him. He knows a lot about the environment. Put aside the billions of dollars and he is just a guy who likes to understand the world. He reads dozens of books every year. Like me.

Growth: From Microorganisms to Megacities by Vaclav Smil is published by MIT Press (£30). To order a copy go to guardianbookshop.com. Free UK p&p on all online orders over £15

What Microsoft founder Bill Gates says about Vaclav Smil's books



Photograph: Saeed Adyani/AP

Energy and Civilization: A History

(MIT Press, 2017)

“Smil is one of my favourite authors and this is his masterpiece. He lays out how our need for energy has shaped human history – from the era of donkey-powered mills to today’s quest for renewable energy.”

Making the Modern World: Materials & Dematerialization

(Wiley, 2013)

“If anyone tries to tell you we’re using fewer materials, send him this book. With his usual scepticism and his love of data, Smil shows how our ability to make things with less material – say, soda cans that need less aluminium – makes them cheaper, which actually encourages more production. We’re using more stuff than ever.”

Harvesting the Biosphere

(MIT Press, 2013)

“Here [Smil] gives as clear and as numeric a picture as is possible of how humans have altered the biosphere... it tells a critical story if you care about the impact we’re having on the planet.”

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