

A Our ancestors lived in eras we call the Stone Age, the Bronze Age, the Iron Age... we live in the fossil-fuel age. The energy we've extracted from the earth has spread abundance, however unequally shared, across humanity. Will this continue and can we manage its impact on our environment? Our guest, Frank Vaughan, is an energy specialist and will help us to see into the future.. .

B I'll do my best. BP regularly publishes updates of its Energy Outlook and the 2015 edition tells us what well-informed people in the oil and gas industry consider the most likely trajectory of the global energy system to 2035. In this period, global economic output is forecast to rise by one hundred and fifteen per cent. Asian emerging economies, principally China and India, will generate more than sixty per cent of that increase.

A The prosperity of emerging economies will catch up with that of high-income countries, then, but won't such a rise in the output of goods and services lead to skyrocketing energy consumption?

B No, energy consumption will grow by only thirty-seven per cent, thanks to rapidly rising energy efficiency. But the combined share of renewable energy sources, hydroelectricity, and nuclear power, will grow from nine per cent to only nineteen per cent.

A This, then, is expected to remain a fossil-fuel age.

B Yes. The revolution in the production of shale gas and tight oil is expected to continue. Their share in primary energy production is expected to rise to about ten per cent, resulting in large shifts in patterns of trade. The US is forecast to shift from being a net importer of twelve million barrels a day of oil in 2005 to being a net exporter by 2035. China is forecast to shift to being a net importer of more than thirteen million barrels a day by 2035, whereas it was self-sufficient in the early 2000s; and India to being a net importer of about seven million barrels a day.

A What is the forecast for emissions of carbon dioxide?

B Emissions of carbon dioxide are forecast to grow by only twenty-five per cent, which is a huge achievement in terms of the link between output and emissions.

A The picture you're painting is one of a world that continues to rely overwhelmingly on fossil fuels and emit ever greater quantities of greenhouse gases. Isn't this achievement inadequate? Couldn't we do better? We're told that emissions need to cut outright, in order to have a good chance of limiting the rise in global average temperature to below two degrees centigrade.

B It's true that if the International Energy Agency's targets are to be met, something far more radical, an accelerated technological revolution, needs to occur.

A And what are the chances of such a revolution taking place?

B At the Oslo Energy Forum in February, one speaker, Amory Lovins, argued that US gross domestic product in 2050 could be two and a half times what it is today, even if the country stopped using oil, coal and nuclear energy altogether and cut its use of natural gas by one-third. This would mean carbon emissions of just one-fifth of their present level. He also argued that the growing economic superiority of the new technologies meant that the revolution could well be driven by market forces alone.

A Does such a radical and rapid market-driven revolution seem likely in the light of the BP report?

B The sense of the report of BP, a fossil-fuel producer, is that such a revolution seems unlikely. There are many purported obstacles: costs, technological limits, slow turnover of the capital stock, inability to implement policy globally, and natural inertia.

A So there's no hope?

B I fear BP is right about the obstacles, but Mr Lovins might be right about the opportunities, though only if policy makers give them a push. If governments could agree to implement a tax on carbon, they would give a big impulse towards a more efficient and less polluting energy future. With this push, normal market forces should pull the world economy towards a more sustainable future.

A So it's a daunting challenge but one that has to be met, for our children's sake.

Outline

The energy extracted from the earth has spread abundance across humanity, however unequally shared. The 2015 edition of the BP Energy Outlook presents oil and gas industry opinion on the most likely trajectory of the global energy system to 2035. The fossil fuel age will continue: energy consumption will grow by thirty-seven per cent, but the combined share of renewable energy sources, hydroelectricity, and nuclear power, will increase from nine to only nineteen per cent. It has been argued that US gross domestic product in 2050 could be two and a halftimes what it is today, even if the country stopped using oil, coal, and nuclear energy altogether and cut its use of natural gas by one third, but such a revolution seems unlikely.

Questions

1 How appropriate do you consider the term "the fossil fuel age" to describe our age? 2 What are your thoughts about the level of global economic growth that is expected? 3 Do you think that market forces will pull the world economy towards a more sustainable future? 4 What innovations would you like to see in the next twenty years?