

Watt's Happening? #267

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THE FUTURE *is* NOW!



*This rig in Iceland is not drilling for oil, but for clean, renewable geothermal energy. As Bob McDonald explains in his new book **The Future is Now**, energy is everywhere, shining from the sky, blowing in the wind, boiling out of the ground, and today we know how to capture and use these unlimited, clean energies as never before.*

Bob McDonald, beloved long-time host of CBC radio's science show *Quirks and Quarks*, has just written a remarkable new book: *"The Future Is Now: Solving the Climate Crisis with Today's Technologies."*

As the climate crisis heightens, we must change our energy ways dramatically. But the good news, he says, is that we already have the technologies we need to do so.

"There is thousands of times more non-fossil fuel energy available than even our hungry consumer mouths are swallowing," says McDonald.

FOSSIL FUELS: AMAZING!

As he so aptly points out: "Fossil fuels are incredible. They pack an amazing amount of energy into a very small space . . . Fossil fuels are easy to carry around, can remain in storage without losing energy until we need them, and, besides providing the power to keep trains, planes and automobiles on the move, can be broken down into many useful products, from plastics to synthetic fabrics, fertilizer, even coffee whitener. No wonder they're so popular.

Too bad the way we burn them is changing the climate."

No problem. Shining from the sky, blowing

in the wind, boiling out of the ground, energy is everywhere, and today we know how to capture and use that energy as never before.

HOW MUCH ENERGY DO WE USE?

One of the most amazing insights in McDonald's book is just how much energy the world is actually using right now. The numbers are astounding!

Worldwide, we consume around 100 million barrels of oil EVERY DAY. That's four billion gallons (billion with a "b"!)" "... enough to keep Niagara Falls running for two hours." Now that's a lot of oil.

But how much energy is that actually? McDonald explains: "Think about the great pyramids of Egypt, the largest man made monuments on the planet. Based on the mass of all the stones that make up the pyramids and the height to which those stones were lifted during construction, in pure energy terms, it has been calculated that it took about 2.4 trillion joules to build those structures." (A metric joule is the energy used to lift 1 kilogram up 1 metre.)

"Translated into oil, the pyramids could be built with about 400 barrels ... That is less than one second of world oil production. So if we look at our total global energy consumption from all sources – fossil fuels, hydro, geothermal, wind, solar, nuclear it works out to more than two million pyramids every year! It took the Ancient Egyptians twenty years to build them once."

Such an immense quantity of energy that needs to be replaced with cleaner sources: wow, that's a daunting task! But as McDonald insists, it's entirely possible, right now.

WE CAN DO IT

Energy efficiency will certainly play a role: the internal combustion engine (ICE), for instance, is

famously inefficient. Put \$100 worth of gas in your car and you are throwing \$80 out the window, because most ICE vehicles are, at best, 20% efficient. We can do better than that.

Solar and wind power are now growing exponentially (doubling every three years or so) because they now produce energy much less expensively than any other energy source. And that cost is going down, while the cost of fossil fuels is going up. Eventually, basic economics will win.

A HOPEFUL VISION

From solar and wind to small nuclear, from fusion and energy storage to carbon capture, McDonald covers it all, bringing the reader up to date with the latest technology and showing us what a clean energy future will look like.

"Rather than becoming depressed over all the bad news coming out of environmental stories or frustrated at the glacial pace of climate action, there is encouragement from a scientific perspective," says McDonald.

RECORD GROWTH IN CLEAN ENERGY

The growth in clean energy is one such indicator. A 2023 Bloomberg NEF analysis saw 40% of the world's electricity coming from zero-carbon sources, including 14% from solar and wind. This 14% milestone is set to be exceeded yearly, as nearly 91% of added net power capacity is now from solar and wind, while fossil fuels contribute only six percent of power production growth – the lowest level on record.

"The solutions are there. It is a matter of implementing them before the climate clock runs out," says McDonald.

For a comprehensive, hopeful and fun read about all the new energies, *"The Future Is Now"* comes highly recommended.

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