

Watt's Happening? #173

by Don Pettit

for Peace Energy Renewable Energy Cooperative

www.peaceenergy.ca ph 250-782-3882



Earth, water, wind and sun



Geothermal, hydroelectric, wind power and solar power together can provide all the energy we will ever need – and so much more.

Today we are poised on the brink of a rapid “phase change” from one vast energy source to another, an historic event that will reshape our lives, open up vast new opportunities and protect life on our fragile planet.

This complex energy transition may perhaps make a bit more sense if we take the insights of ancient wisdom traditions and mix them with a sprinkling of modern science. Let’s give it a try.

THE ELEMENTS – ANCIENT AND MODERN

The ancients of many traditions knew nothing of

what we call science. But they were just as smart as we are. When they looked closely at the world around them, they saw that there was order and pattern there.

They saw that yes, nature took on a bewildering number of forms, apparently without limit, but that all these countless forms fell into just four simple categories: earth, water, air and fire. These were the four fundamental “elements” of many ancient traditions.

Today modern science has of course discarded this definition of the “elements” and now has found 92 modern elements, the pure substances that cannot be separated into simpler substances by

ordinary means, and that make up all the different forms of matter in the physical universe. Everything, everything, everything is made up of different combinations of these 92 elements. Hydrogen, nitrogen, zinc, sulfur, aluminum, calcium, iron – these are examples of the modern “elements.”

THE FOUR STATES OF MATTER

It is interesting to note, however, that even in modern science, there are still just four fundamental forms of matter, today called “states” of matter: solid, liquid, gas and plasma, corresponding perfectly to the ancient elements of earth, water, air and fire.

Each of these states of matter, as we move up the scale from solid to plasma, is at a higher and higher energy level. Starting with solids at the lowest energy, we can add energy until at some critical level there will be a rapid “phase change” to the next highest energy state, and so on.

Think of solid water (ice) staying as ice as we slowly add energy (say, heat) until suddenly it melts and changes to liquid water. Adding more energy eventually causes another sudden phase change to gas (water changes to vapour as it begins to boil) and then with a lot more energy, a sudden change to a stable very high-energy plasma.

THE FOUR PILLARS OF NEW ENERGY

The four ancient elements and the modern scientific states of matter correspond beautifully to the four pillars of modern renewable energy: geothermal power from the heat of the Earth, hydro power from the energy of moving water, wind power from the energy of moving air, and solar power from our most energetic forever energy source, the sun, an

immense shining ball of nuclear plasma.

Geothermal and hydro provide centralized, solid baseline power. Wind and solar, although intermittent, are plentiful and distributed everywhere. Together, they are all we will ever need.

Phase changes are rapid, but the states of matter between each are stable. In our human energy history, there have been four “phase shifts” to new sources of energy, each followed by a long, stable pause. Yet change was always coming, as human ingenuity, knowledge and experience quietly built up the “energetic” background, preparing the way for the next phase shift.

The four pillars of new energy: earth, water, wind and sun.

ENERGY CHANGES

From the very first power sources of human and animal muscle, our first energy phase change was to that of the early use of wind and waterpower. With these we explored our planet and began the pursuit of modern science.

Then, just a few hundred years ago, the second major shift occurred, this time to coal, spawning the era of steam power

and the industrial revolution: a higher energy state.

The third great energy change was from coal to the more versatile and powerful oil and gas, the era we are in today. With this we became history’s first worldwide civilization, perfected the modern scientific method, invented vast and powerful technologies, and explored both the microscopic and macro cosmic universes.

Today, we are at the beginning of our next great energy revolution, this time to the “forever” pollution-free renewable energies from the earth, water, wind and sun.

We are now seeing the fourth, and perhaps final, great and rapid energy phase change of human civilization.