

(reprinted with permission from the 30th anniversary issue of
Modern Power Systems, January 2011)

Electricity to the rescue

By Walt Patterson

We are managing energy wrong. But over the coming decades electricity could be the key to getting it right.

Why wrong? Think about it. We say 'energy' when we really mean coal or oil or natural gas or even electricity. They're not the same. They're not interchangeable - not without also changing the technology to use them. Readers of *MPS* understand that very well. Politicians appear not to. Furthermore what they call 'energy policy' is really just 'fuel and power policy', as it was half a century ago, ignoring almost completely why we actually want the fuel and power. We want them to *run stuff* - lamps and motors and heaters and chillers and electronics, and especially buildings. Real *energy* policy would focus first of all on the user-technology and infrastructure that deliver the energy services we desire. But user-technology and infrastructure remain an afterthought.

Instead we grapple with problems of security of supply and climate. But those problems, serious though they be, are not about energy. They are about *fuel*. We have almost forgotten the word fuel. We need urgently to recall it. Fuel is the reason we worry about OPEC and Gazprom. Burning fuel is the main reason we are upsetting the climate. If we want to reduce our vulnerability to interruptions of fuel supply, and minimize the consequences of emitting fossil carbon dioxide into the atmosphere, we have to reduce our use of fuel.

We can do so in two related ways. The first is to recognize that the most important competition in any energy market is the competition between fuel and user-technology. For any energy service - comfort, illumination, motive power, electronic information and communication - the better the user-technology the less fuel it needs to deliver the service. Don't call this 'energy efficiency', or even 'fuel efficiency'. What matters is not how well the technology uses fuel, but how well it delivers the desired service - what we ought to call 'energy performance'.

For almost any user-technology the available room for improvement is substantial. For buildings alone it is vast, as study after study confirms. However, today's energy companies still make their money by selling fuel or electricity by the measured unit: the more they sell the more their revenue. It is in their interest for the rest of us to use technology with mediocre performance, requiring us to buy and pay for more fuel and electricity. This simple, perverse incentive is the biggest single obstacle between us and a more secure, healthier planet.

We need to change the ground-rules, so that the companies become true *energy* companies, making money by upgrading and improving everyone's buildings and other user-technology. Energy business should become more and more a matter of investment not in yet more supply technology but in continually improving user-technology. That means not commodity markets but contract markets, as the UK's incipient Green Deal concept is to demonstrate. It links the investment to the property rather than to the user, creating mutual benefits, with a low risk and guaranteed return for enlightened companies and users alike.

The second way to reduce our use of fuel starts by recognizing that human society uses two different kinds of electricity. One we generate using the stored energy in fuel, such as coal, natural gas or uranium. The other we generate using technology to convert natural ambient energy - hydro, wind, photovoltaic, solar thermal, wave, tidal and geothermal - into electricity. This electricity *does not use fuel*. Most people call it 'renewable'; I prefer to call it 'infrastructure electricity'. It is created and delivered by the function of physical assets, not by combustion or any other reaction. Once the assets are in place and functioning, whenever the natural ambient energy is available the infrastructure converts it into electricity, for us to use however we wish.

Using fuel the way we do threatens the security of our energy services and the climate of the only planet we have. Of all the ways we use fuel, generating electricity is the easiest to change. To get better, more reliable, more universally available and sustainable electricity services, we should be aiming to move as rapidly as possible away from fuel-based electricity to infrastructure electricity, for every feasible application, all over the world.

It will not happen rapidly. But it might happen more rapidly than many now expect. A coherent vision of a low-carbon, low-fuel future led by innovative electricity looks ever more appealing. Thirty years hence, how much closer might we be? That depends on the decisions we take today. Let's take them with a vision in view.

(c) Walt Patterson 2011

Walt Patterson's latest book, Keeping The Lights On: Towards Sustainable Electricity (Chatham House/Earthscan), is now available in paperback.