

Energy In Transition:

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Energy Performance: Key To Transition

Keynote address by Walt Patterson

We're managing energy wrong. We've been doing so for decades. We think about it wrong. We talk about it wrong. We manage it wrong. As a result we're making a mess of energy, all over the planet. Two billion people, one-third of our fellow humans, still don't have electric light. We fortunate ones who do have electric light worry about 'energy security' - that we may soon have trouble keeping the lights on. Meanwhile science tells us more and more urgently that we're upsetting the climate. Managing energy wrong may cause global catastrophe.

The organizers call this conference 'Energy In Transition'. Let's be clear about what that means. It means changing the way we think about energy, the way we talk about it, and the way we manage it. Tinkering at the edges will not do. The transition we need must be fundamental, far-reaching and fast.

It could start by changing the way we use the word 'energy'. Since the early 1970s we've been using it wrong. We say 'energy' when we really mean oil; or coal; or natural gas; or electricity. They are not the same. They are not interchangeable. But calling them all 'energy', smearing them all together, makes too many people, especially politicians, think one can substitute for another.

We talk about 'energy supply', when we mean, perhaps, 'oil supply' - not the same as 'gas supply' or 'electricity supply'. Why do we need these supplies? That is the key detail we so often ignore. We need fuels and electricity to *run stuff*. What matters is the *stuff* - the lamps and motors and electronics, the appliances and fittings and industrial plant, and especially the buildings. This stuff, these technologies, provide what we want - the comfort, the illumination, the cooked food, the motive power, the refrigeration, the mobility, the information, communication and entertainment. The technologies are what really matter. Oil by itself is almost useless. Natural gas by itself is downright dangerous. Electricity as we use it does not even exist by itself. It's a process taking place in technology. Fuels are only useful *because of technology*.

The title for today is 'becoming efficient through people and technology'. I dislike the word 'efficient'. I know we're stuck with it, as we're stuck with a lot of other misleading language about energy. But I'm a lapsed nuclear physicist, and a pedant. To physicists, 'efficiency' is a measurement: how much useful energy you get out of a process, as a fraction of the amount put in. To call technology 'efficient' just tells us how well it uses fuel or electricity. It doesn't tell us how well the technology delivers the services we want. The most important energy technology is buildings; and you can't measure the 'efficiency' of a building, because most of the energy coming

in - from sunlight, body heat, heat from lamps and appliances and so on - isn't measured. You can, however, describe the building's *energy performance* - how well it keeps its occupants comfortable, and provides the other services they desire. I was relieved and pleased when officialdom decided to require what they call 'Energy Performance Certificates' for buildings - not only that the certificates are now required, but that they refer explicitly to 'energy performance', a qualitative description, rather than to a spurious quantified number called 'efficiency'. That gives me hope that we may in time clean up the rest of the sloppy language that confuses and cripples our attempts to devise and implement real *energy* policy.

What do I mean by 'real energy policy'? What we call 'energy policy' today still means policy preoccupied almost entirely with supplies of fuels and electricity - what we used to call, correctly, 'fuel and power policy'. Fuel and power policy takes user-technology pretty much for granted, and ignores it, except as hand-waving aggregates and averages of undifferentiated so-called 'energy demand'. Real 'energy policy' would recognize that we *do not have* 'energy demand', or an 'energy problem'. We have an assortment of quite specific and distinct problems with various energy services: how best to provide comfort, illumination, motive power, mobility and so on, in an endless variety of contexts all over the world, with an endless variety of specific user-technologies, that may - *or may not* - require specific fuel or electricity to run them.

Real energy policy also recognizes something profoundly important, that fuel and power policy ignores. Better user-technology requires *less fuel* to deliver the same or better services. Fuel and user-technology *compete directly* with each other. Key competitors for ExxonMobil are not Shell nor BP but Toyota and Honda. Competitors for Gazprom are Europe's manufacturers and installers of thermal insulation. Competitors for EDF and E.ON are the manufacturers of compact fluorescent and LED lamps; and so on, across the entire range of user-technology and infrastructure around the world. Real energy policy will foster this crucial competition, to upgrade our user-tech and infrastructure, as the direct objective of coherent strategy for climate and security.

We get energy services not from fuel alone but from *systems* - systems of technology, that in turn are created and maintained by social and financial systems - that is, by people working together accordingly to an agreed understanding and a corresponding framework of rules. To accelerate the transition we urgently need, we have to refine our understanding and refocus the rules. We can start by stating explicitly what we know to be true but have been too mealy-mouthed to say out loud. We talk about a low-carbon UK, a low-carbon future in a low-carbon world. Let's not be coy about this. Low carbon means *low fuel*. We need to use *less fuel*.

We know how. We've known how for decades. We have to invoke better technology - better buildings, better lamps and motors and electronics, better vehicles, and so on. But this is where real energy policy comes in. This is where we also need to refocus the rules, especially the rules for business. At the moment, the large international corporations that call themselves *energy* companies make their money by selling fuels and electricity. They're playing by the rules our governments have made, and they're playing very profitably. But real *energy* policy will no longer focus on short-term batch transactions selling fuels or electricity. Real energy policy will focus on the *energy performance* of our user-technology and infrastructure. It will rearrange the rules, so that energy companies, powerful, capable and versatile, shift their focus and change their business plans, so that they make money by improving our user-tech and upgrading our infrastructure - to focus, in short, on *energy performance*, on improving our energy systems.

On Wednesday, for example, this conference will be hearing from Dr Tony White about what he calls 'Project Rachael', a simple and straightforward way to encourage electricity and gas suppliers to invest in upgrading the premises of their customers - to make money while selling less fuel or electricity. On 12 March this year the UK government endorsed Tony's proposal. Now we need to make sure that UK companies and the regulator actually implement it, as quickly as possible; and we need to replicate the idea around the world.

Infrastructure is also why renewables matter. Renewable electricity, whether from wind, photovoltaics, hydro or marine energy, *does not use fuel*. Renewable electricity is infrastructure electricity. You install a physical asset and it delivers electricity. Many decades hence, if we get this right, our energy systems and our built infrastructure will be one and the same, delivering all the services we desire as a function of the infrastructure. We will not measure energy performance by the unit. We will not buy or sell it in batches. We will invest in the assets, then use them as we wish, exactly as homeowners now use their homes.

Is this too visionary? I don't think so. We need a vision, to guide this transition. I don't look to a low-carbon future. I don't look to a low-fuel future. I look to a *high-performance* future. Let's go for it.

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