Managing Energy Wrong:
What The Future Holds For Energy Users

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When I saw what the organizers wanted me to talk about this morning, I recalled the words of the great Danish nuclear physicist Niels Bohr: 'Prediction is very difficult, especially about the future'. A lot, however, depends on what you are trying to predict, and why. I predict with confidence, for example, that the sun will set this evening and rise tomorrow morning. If I'm wrong my failed prediction won't much matter. In any case, right or wrong, I can't do anything about it. Either it happens or it doesn't. All I can do is wait and see. Unlike sunset and sunrise, however, some predictions matter. Moreover, and more importantly, some predictions you can do something about.

This morning the organizers have asked me to tell you what the future holds for energy users. I can tell you right away, and with confidence, that the future for energy users will be a lot less predictable than sunset or sunrise. That is partly because - as my title declares - we are managing energy wrong. The way we manage energy makes predicting the future much more difficult than it needs to be. We energy users focus on aspects that are mostly beyond our control, while mostly ignoring the aspects we actually can control.

What in particular do we want to predict, and why? The conference title says 'Energy Prices'; and this opening session is entitled 'Energy Prices: Overview and Outlook'. Right away I see a problem. Nobody buys 'energy'. We say 'energy', when we really mean, perhaps, fuel oil, or petrol, or natural gas, or electricity. They are not the same. They are not interchangeable. Calling them all 'energy' makes non-specialists, especially politicians, think they can substitute one for another. They can't. You can't run your petrol car on diesel, much less natural gas or electricity. You can't run your American 60-hertz AC motor on European 50-hertz AC electricity. In fact, despite the title of this presentation, we are not even 'energy users' as that expression is commonly understood. What we use is not some amorphous commodity called 'energy'. We use petrol, or diesel, or natural gas, or electricity, of very precise, very tight specifications. What matters is what we use them *for*, and what we use them *in*.

We use fuels and electricity to *run stuff*. The *stuff*, the user-technology, is what matters - the buildings, the lamps, the heaters and coolers, the motors, the electronics, the vehicles. This user-technology is what actually delivers the services we want - the comfort, the illumination, the motive power and mobility, the information, communication and entertainment. These services are separate and distinct, and not interchangeable; nor are the user-technologies that provide them. We do not,

therefore, have an 'energy problem'. We have a lot of different, distinct problems - how best to provide comfort, or illumination, or motive power, and so on, in different places and different circumstances around the world - rich and poor, urban and rural, temperate and tropical, inland and coastal, lowland and mountainous and so on. Using the label 'energy' makes too many people think that 'one size fits all'. It does not. Worse still, it makes people think that the most important part of the system delivering the services is the commodity fuel or electricity it may require. It is *not* - on the contrary. The most important part of the system is the user-techology or user-infrastructure - the building, the fitting, the appliance, the process plant, the vehicle. The better this user-tech, the better this user-infrastructure, the less fuel it needs to deliver reliable, quality service. We've known this for decades, We've talked endlessly about what we call, mostly erroneously, 'energy efficiency', without ever doing much about it. But we are now at last coming to understand these arrangements in a new way.

Proponents of the 'free market', including regulators, have been preoccupied for at least two decades with 'competition', as a way to ensure optimum satisfaction of what they call energy users. They still mainly think, however, that this means competition between different suppliers of natural gas, or between different suppliers of electricity. They think that what matters to energy users is the lowest achievable price of a cubic metre of gas or kilowatt-hour of electricity. In my experience, however, the great majority of energy users - that is, all of us - have absolutely *no idea* what they are paying per unit for gas or electricity. What matters to them is the *bill*. What they want is a *low bill*. A low unit price may not mean a low bill. On the contrary, a *high* unit price may well mean a *lower bill*. That's because a high fuel or electricity price forces us to stop ignoring the most important part of the system - the technology and infrastructure we ourselves use.

The most important competition, the competition that really matters, is between *fuel* and *technology*, for the reason we are at last beginning to understand: because better technology, better infrastructure, delivers better, more reliable services while requiring less fuel or less electricity. 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. The competition between user-technology and fuel is different for different services, and is evolving rapidly as technology evolves.

What does this mean for you and me, as energy users? Start by recognizing explicitly that we are users not just of fuels and electricity but of technology and infrastructure. You and I have little or no control over availability, reliability and prices of fuel oil, natural gas, electricity and the other commodities we've come to call 'energy'. What we can control, to what may be a considerable extent, is our own user-technology and infrastructure. That's what I mean by 'managing energy wrong': focusing on fuels and electricity instead of on the stuff that delivers the services - the user-technology that competes with fuel. If we take the *stuff* for granted we users of fuels and electricity are at the mercy of the future. What we users can control is the *stuff*: the user-technology, and especially the buildings. By doing so, we users can thereby recover a measure of control over the future.

I personally dislike the expression 'energy efficiency'. When you can actually measure it - and often you can't, for instance for a building - it only tells you how well the technology uses fuel or

electricity. I prefer the expression 'energy performance' - how well the technology delivers the service you actually want. For you, as a user of energy services, the key questions therefore should therefore be: how well does my user-tech, my infrastructure, perform? and can it do better?

You ought to know not just how much you use, but what you use it *for*. What do you know about *how* your technology uses fuel and electricity? How much goes for heating, lighting, motive power, cooling, mobility, information, entertainment? You can easily find out fascinating details. Three months ago I purchased a gadget that fits on the incoming electric main to my house, and a meter that plugs into a wall-socket. The gadget on the mains feeds a digital display on my mantlepiece, telling me at any instant how much electricity is coming into the house. When someone switches on the electric kettle the display leaps upward. I rapidly identified a number of parasitic vampire loads I'd never previously noticed, for instance a one-kilowatt electric heater in the basement I'd left on 24 hours a day. Yike. The wall-socket meter tells me how much electricity the appliance plugged in is using. Just by keeping a eye on these two gadgets I've cut electricity use in our house by more than half. The company sent me an estimated bill for well over £500; I sent them back a corrected meter reading that reduced the bill to under £150.

Other speakers today will be describing some key aspects of this approach to managing energy, focusing not on fuel but on user-technology and infrastructure. You don't have to do this yourself. Enlightened energy companies are already looking for ways to help you. Let me tell you about an idea I find especially exciting. In the UK, a friend and colleague, Dr Tony White, ex-CEGB and Kleinwort Benson, a co-founder of Climate Change Capital, has devised what he calls 'Project Rachael', to encourage electricity and gas suppliers to invest in upgrading the premises of their customers - to make money while selling less fuel or electricity. When the supplier invests in a customer's premises, by installing insulation, better lighting, better doors or windows, better controls, microgeneration or some other performance upgrade, the supplier receives a return on the investment by a suitable surcharge on the bill - a guaranteed, risk-free return, a very attractive business proposition. But the upgrade reduces the amount of fuel or electricity used, making the overall bill not higher but probably lower. Company and customer both win.

The key to Project Rachael is that the requisite contract is tied not to the property-owner but to the property itself, a relationship akin to those for incoming supply-pipes and wires. If a particular owner changes supplier, or even sells the property to a different owner, the contracted payments to the original investor continue. On 12 March this year the UK government endorsed Tony's concept. We now need to publicize it and urge regulators to implement it; and we need to replicate the idea around the world.

In the wake of the financial mess, leading commentators such as Professor Nick Stern and President Obama's energy and science advisors have called for 'green stimuli', investing in upgrading infrastructure, such as government buildings. Innovative ideas abound. Looking into my crystal ball, I predict that what the future holds for us energy users is abundant opportunities to manage energy right. Let's do it.