No one is unaware of the need for our products and processes to become more energy efficient and yet, often due to a focus on the short term, there remains a reluctance to make the transitions required.

To arrive at a carbon neutral world by 2050, we need to drive overall energy efficiency improvements of at least 3 per cent per year. ‘We’ – industry, transport, public infrastructure, homes – must at least double the rate of energy efficiency improvement, primarily by accelerating infrastructure renovation to around 3 per cent per year. In parallel with this we also need to be moving to clean energy sources at a rate that also equates to 3 per cent of our energy mix per year.

Critically, the current rate of energy efficiency improvement hovers at around 1.5 per cent per year. At the same time, demand for energy continues to rise at about 3 per cent per year driven by population growth, increased prosperity and mobility. Simply doubling the rate of energy efficiency improvement would reduce global energy costs by more than US$2 trillion by 2030, slash the average household energy bill by a third, and create more than six million jobs by the end of this decade.

There are two main elements required to double the rate of energy efficiency improvement. The first is accelerating the renovation of existing infrastructure in developed countries. Secondly, there needs to be a focus on helping developing countries leapfrog to clean technologies such as solar-LED and combine these with new business models. It is a sad fact that many of the countries which have suffered the most from climate change have been least responsible for creating it. It is vital that developing countries do not follow the same destructive phases that the richer nations of the world have been through.

When speaking about energy, we often talk about individual technologies and their potential in their respective silos. In reality, we must pursue them all. Energy efficiency, renewable energy and carbon engineering are all needed. Only by enacting all of them in unison will we be able to achieve the ultimate goal of carbon neutrality in the coming 40 to 50 years. The International Energy Agency projects that energy efficiency needs to do over half of this job. One could say that by combining energy efficiency and renewable energy we can decarbonise society twice as fast and twice as cost-effectively.

The fact is that many of the technologies we need already exist. All that is required is to take a longer-term view which the challenges of today and tomorrow demand of us.

By adding a focus on social equity and inclusiveness, we can enter an age where the socio-economic model becomes about Sustainalism, building on the foundations laid by capitalism and socialism, but taking the broader view which the challenges of today and tomorrow demand of us.

Above: LED-lit Dragon Bridge in Da Nang

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But off-grid solar LED lighting solutions can help to end this injustice, at a fraction of the long-term cost of kerosene or typical infrastructure, while stimulating social and economic development as communities are brought out of the dark.

However, in all these cases what can hold the development back is the initial up-front cost. The cheapest individual lightbulb to buy remains the incandescent bulb – yet viewed over any length of time, it becomes the most expensive.

It is also extremely limited technology. In contrast, LEDs can now be embedded with sensors and intelligence so they can be connected wirelessly and managed remotely via the internet. This connected lighting for smart buildings and smart cities can further boost the initial energy savings by up to 80 per cent.

The benefits of this connected technology can be measured in much greater terms than simple energy savings. Businesses can enable employees to personalise their lighting and temperature at their workspaces via a smartphone app, with associated improvements in both productivity and employee well-being. In addition, building managers can receive real-time data on how the office is being used, how much space is required, and how to optimise the space they have.

The benefits of connected lighting can be seen on a city-wide scale. For instance, the City of Los Angeles has converted 140,000 street lights to LED and has 110,000 nodes connected and managed through a Philips Lighting CityTouch connected street lighting management system. Not only does this allow the city to remotely manage and monitor the lighting, but the technology is already available and simply needs accelerating.

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