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Renewables stir strife over jobs

New energy technologies bring many benefits, but employment effects must be managed

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The conflict between renewable energy and coal in SA was illustrated recently by coal truck drivers flexing their perceived might at the possible loss of jobs.

Technological change worldwide is moving apace, with the result that the interface between job loss and creation has to be carefully managed. What is SA's government doing about it?

Job loss and job creation in society as a result of technology innovation are part of the competitive nature (efficiency) of the capitalist marketplace.

The Luddite hostility of the truck drivers needs attention as the global energy sector is undergoing rapid change, with the effect of renewable energy (decarbonising electricity) and the electric motor car with its associated battery technology.

Also worth mentioning is the development of LED technology, for which the 2014 Nobel prize for physics was awarded. A US department of energy report estimates that the ongoing change of all lights to LEDs by 2030 in the US would save something like 1.8-billion tonnes of coal. Big numbers.

Technology has, since the Industrial Revolution (roughly 1800–1890), been an important component of the improvement of humanity's quality of life, with two world wars accelerating this technological development.

The effect of the Nobel prize-winning discovery of the "trans-resistor" or transistor effect in the 1940s, which eventually resulted in advent of the computer and cellphone, continued this acceleration.

Looking to the future, we see another two spectacular technology changes taking place: the electric car and the effect of renewable energy or the decarbonisation of electricity.

After the global energy crisis of 1973-74, US president Jimmy Carter accelerated the development of renewable energy technology by significantly increasing federal funding. However, Ronald Reagan subsequently cut back on this spending as there was no major market pull-through on the horizon then.

In the mid 1980s, I visited Washington to access information to determine the way forward for solar energy in silicon metal production. My conclusion that photovoltaic panels were not going to become a significant outlet for silicon metal in the next 10 years was pretty well confirmed.

This all changed in the late 1990s with the anxiety over climate change, and has been dramatically illustrated with the improved efficiency of solar cells from about 6% in the mid-1980s to more than 22% today.

While silicon metal for solar cells is nearing the end of its technological improvement, there are future technologies at hand such as perovskites that hold promise for pushing the efficiency of photovoltaics further upwards and the associated costs downwards.

ECONOMIC ADVANCE

The economics of renewable energy sources (solar and wind in particular) has now reached an impressive situation where it is becoming cost-competitive with traditional energy sources, namely coal, nuclear and gas.

Renewable energy now accounts for about 1% of annual electricity production in the US and the economics are on a par with coal, nuclear and gas (although without the cost of storage for intermittent sources added in). It also holds significant potential for job creation.

Currently, 260,000 reported jobs in the US in renewable energy is more than that of coal, nuclear and gas combined.

Wind energy is becoming particularly important in the energy mix; for example, Denmark and Scotland can generate an entire day's energy requirements from wind alone. The Netherlands runs its whole rail system on wind.

The Chinese have a solar photovoltaic park that has a maximum generating capability of more than 800MW – similar to a nuclear unit's capability. Together, solar and wind make a remarkable success story.

By comparison, while SA has a sound renewable energy development programme through independent power producers (IPPs), it is some way from being world-class. However, the IPP programme has precipitated the conflict with the coal drivers and their perceived job losses. This has to be managed better if SA is to avoid conflict.

Renewable energy is here to stay, and although in its relative infancy as a technology, there is considerable optimism worldwide for future success. The cost reduction as a function of cumulative capacity (the experience curve) is well-researched and in the 1970s, was loosely referred to as Boston Consulting Theory.

Michael Liebreich, the advisory board chairman of Bloomberg New Energy Finance, was quoted in a recent article stating that "renewables are robustly entering the era of undercutting [fossil fuels]". The article outlines this remarkable success story and Lazard's levelised cost of energy graph (the latest costing technique) provides a further useful quantitative comparison of the costs of renewable energy versus fossil fuels.

One should not be misguided by the misinformed statements of US President Donald Trump, who is questioning the importance of renewable energy and considering support for coal. Either he is being badly advised or he has shares in the coal business, because a focus on renewable energy would provide just the impetus for his mantra "more jobs for Americans".

This also rather raises the question: in today's rapidly changing technological world, does a president need a technological background such as Germany's Angela Merkel (who has a PhD in physics) to successfully drive this change?

In SA, we do have Naledi Pandor in the Cabinet; however, we are not in a position to drive the frontiers of technological change here, without huge numbers of trained specialists and the associated funds.

BARRIERS TO PROGRESS

The conflict arising from rapid technological change is ever-present, caused by the effect of job losses and lack of creation of alternative jobs.

It is useful to remember how one innovation, the inkjet printer, was blocked for some time by trade unions in the UK. This development meant the transfer of newspaper production using the old printing technology of Fleet Street to satellite facilities with Imperial Chemical Industry's pilot plant in Manchester.

Can you imagine with our current state of information technology that anyone would have questioned the introduction of something as simple as an inkjet printer — now a household item purchased from almost any retail outlet?

At the recent World Economic Forum conference in Davos, the term Fourth Industrial Revolution brought up the issue of more expected job losses. Part of this forward picture is the advent of 3D printing or additive manufacturing, as distinct from the current machining or casting manufacturing technology.

While there is no doubt scientific innovation has materially improved people's quality of life, governments that wish to keep ahead must heed the call for future technologies – not those that rely on outdated coal-fired power stations and expensive nuclear plants for job creation. Retraining people for technological change is a necessity to avoid conflict over job losses.

That would be the "radical economic transformation" we really need.

Wood, a former newspaper columnist and silicon metal development manager, has a PhD in physical chemistry.