

Climate-friendly technologies

What are the benefits?

In the last *Labour Bulletin* **Richard Worthington** outlined the causes of alarming climate change. Following on this, he details the possibilities of arresting this process and talks about some of the positive outcomes in following a climate-friendly technology route.

In the previous edition I noted that South Africa's greenhouse gas (GHG) emissions should peak no later than 2020 if we are to make a reasonable contribution to global efforts to avert climate catastrophe. By this I mean keeping global warming below 2 degrees compared to the pre-industrial global average temperature (about 15 degrees). Combined with deep reductions by developed industrialised countries, limitations on developing country emissions are needed so that total global GHG emissions peak no later than 2015.

Projections of South African emissions without constraints suggest that by 2050 they will be at least four times what they are today, when they should be well below half. While emissions will need to increase for a while if we are to achieve goals of employment and poverty reductions, the higher they climb, the harder and more costly it will be to bring them down again. With 80% of emissions coming from the energy sector, we urgently need to assess the future costs and risks of continuing carbon-intensive investments (fossil fuels and energy-intensive industries like aluminium smelters). The use of renewable forms of energy is one way to reduce these destructive emissions.

TAKING THE ISSUES SERIOUSLY

There is more than enough renewable energy for all our energy

needs, but the full costs of concentrating this energy must be paid up front as capital investments. The costs of accessing fossil fuels, on the other hand, are paid as people consume them while the cost of the pollution they produce is carried by society as a whole, and particularly by workers and local communities or, in the case of GHGs, passed on to future generations.

We can see the impacts of emissions on the environment in such things as reduced water supply, crop failures and rising sea levels. But dealing with these problems is fundamentally an economic one. How do we mobilise sufficient investment in climate-friendly technologies, when dirtier options are more profitable under current market conditions? This should be a principle focus of South Africa's Integrated Energy Planning (IEP), as well as of Environmental Fiscal Reform (EFR). Unfortunately the IEP process was suspended last September and remains "in abeyance" and nothing has been heard of EFR since a draft policy paper was published for comment in April 2006.

A longstanding tactic of many companies is the argument that there is a conflict between development and maintaining a healthy life-support system. This obscures the links between social and environmental justice. The advent of Sustainable Development

supposedly recognised the interdependence of economic, social and ecological benefits, yet leaders still accuse activists of putting 'environment' before development. This is why the Stern Review, which highlighted the threat that climate change poses to economic growth, has been so important.

The statement by Stern, formerly chief economist at the World Bank, that climate change "is the greatest and widest-ranging market failure ever seen" no doubt helped to prompt Minister Manuel's promise of "green" measures in next year's budget. This could include a 'carbon tax' or other pollution charges, but it may be no more than incentives for biofuels and these might benefit only industrialised agriculture and big energy companies.

We have not heard much about climate from organised labour in South Africa, but internationally it has been taken up by the ILO (International Labour Organisation). This is fitting given the equity dimension of accelerating climate change: it is the poor and those least responsible for the problem that are most vulnerable to the impacts. A further motivation for labour to join the call for urgent climate action is that many of the measures to mitigate climate change by limiting emissions have co-benefits, such as increased employment or safer working conditions.

Renewable energy is better for **BOTTOM UP** development – it allows for direct **COMMUNITY** involvement

START A JUST TRANSITION TO SUSTAINABLE ENERGY!

Conventional energy: **73%** less employment in the electricity sector since 1980



Renewable energy needs people: **One million** new energy jobs possible by 2020

Sustainable energy brings MORE jobs!

We have the SUN but we DON'T have the JOBS!

Direct jobs per unit of electricity
(Jobs for every 10 GigaWatt/hours generated)

Conventional energy technology	Renewable energy technology
Coal (current): 3 jobs	Solar thermal: 104 jobs
Coal (future): 1 job	Solar panels: 420 jobs
Nuclear: 1 job	Wind: 128 jobs
Public land nuclear reactor: 2 jobs	Biomass: 56 jobs
Gas: 1 job	Low/tilt: 230 jobs



Renewable Energy is Peoples' Power

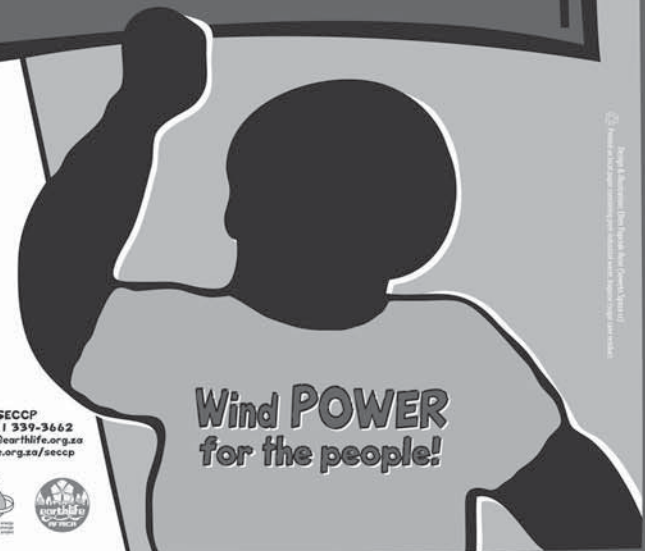
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JOB CREATION AND OTHER OPPORTUNITIES

South Africa is amongst the least energy efficient nations in the world. Yet many opportunities for improvement lie in intelligent design. The implementation of energy efficient standards in low-cost housing, such as requirements for insulated ceilings, would improve quality of life, including children's health, reduce the energy bills of poor households and avoid local and atmospheric pollution. When quality is sacrificed for quantity, resources are wasted and people are made more dependent on service providers.

Land management provides another example. As industrialisation of agriculture has replaced human and animal energy with machines and fossil fuels, including fertilizers and pesticides which are zero-rated for VAT, human labour is reduced in our food production and we are made dependent on commercial suppliers. Land is also degraded and requires additional inputs and it loses the ability to store carbon. We may in future have to bring human and animal energy and waste back into the business, if only to restore the land's ability to hold carbon.

Rational urban planning should ensure that people can access shops and other services without using motorised transport. The failure to introduce integrated public transport systems increases the use of private vehicles which become less efficient as more vehicles take to the roads. The failure to enforce vehicle maintenance, even of public and commercial fleets, means further wasted fuel and increased air pollution.

In South Africa 29 companies, primarily in mining and minerals processing, account for about 40% of national electricity consumption. Yet efficiency improvements in some energy-intensive industries do not necessarily lead to savings or

significant public benefits. Mining equipment, for example, has become more efficient but mines now have to go deeper and deeper to extract lower quality resources. To improve the energy efficiency of the economy as a whole, we need to radically improve resource efficiency, including material reuse and recycling, which also requires human energy.

The greatest opportunity for job creation through investment in climate-friendly technologies is in renewable energy, an area in which some developing countries are big players. An Indian company recently bought a majority share in a German wind company. China is producing the world's most cost-competitive solar water heaters, to international standards, through large-scale manufacture. Yet South Africa allows an international license for mass production of a cost-cutting photovoltaic technology, developed at the University of Johannesburg, to go to Germany.

A study published in 2003, which quantified employment associated with different energy technologies, featured in *Labour Bulletin 30.4* illustrates the point. The table below compares *direct* jobs in the electricity industry, using renewable energy versus jobs in conventional or stock energy (fossil or nuclear fuels). As different technologies have different availability factors (deliver different quantities of energy from a plant of the same rated capacity) figures are given per unit of electricity dispatched, in GWh (billions of

domestic meter units), as well as per MegaWatt (MW) of installed capacity.

Renewable energy technologies (RETs) come in small units and are suited to decentralised applications and bottom-up project development, offering substantial opportunities for communities to participate in delivering energy services. Thus in addition to creating formal jobs in commercial operations, implementing RETs will also have benefits in the so-called "second economy," for example through letting of land (some Texas cattle farmers are making more from the wind companies than the animals they raise amongst the windmills) or producing biomass and avoiding cash leaving communities to pay corporate suppliers.

GOVERNMENT AND OTHER INITIATIVES

Clearly, avoiding hundreds of millions of Africans becoming climate refugees and our children being left with insufficient water for basic needs, are not the only reasons for driving massive investment in climate-friendly technologies and practices. Fortunately we don't need to wait for the Department of Mineral and Energy (DME) to resume Integrated Energy Planning, useful as this would be. We can engage authorities on how public spending is directed, when standards are introduced and enforced, and what kind of market measures are needed to address costs.

In addition to promising "green taxes", government has committed to reviewing both the renewable energy target (in the White Paper 2003) and

Direct jobs in electricity supply

Renewable energy technologies	Per GWh	Per MW	Conventional energy technologies	Per GWh	Per MW
Solar thermal	10.4	5.9	Coal (current)	0.3	1.7
Solar photovoltaic	62	34.5	Coal (future)	0.7	3
Wind	12.6	4.8	Nuclear (current)	0.1	0.5
Biomass	5.6	1	Nuclear PBMR	0.2	0.2
Landfill	23	6	Gas	0.1	0.1



implementation of the 2005 National Energy Efficiency Strategy in 2008. These reviews should be informed by another important process: the Long Term Mitigation Scenarios (LTMS) being developed to explore the likely costs of policies and measures to limit and then reduce GHG emissions.

Business and industry, particularly those with a large carbon footprint (high emissions), have a far stronger presence than organised labour (an occasional representative) and other civil society representatives. However, it is a rigorous process and probably the most transparent and inclusive deliberation on our country's future development options that has been initiated to date. Looking at emissions from all sectors, it should impact on energy developments, and chemicals industries, agriculture and waste management.

Cabinet mandated the LTMS process and the results should be reported to ministers and other leaders in the first quarter of 2008. Some stakeholders are likely to feel threatened by what the process shows and the conclusions drawn from the findings. However, the broad

trend of high-emission's industries employing fewer workers means that both workers and the unemployed can only benefit from serious consideration of the findings.

It is unfortunate that the Externalities Study, which was commissioned by DME last year as part of IEP was once again postponed. This should also have served as input to the LTMS. This makes it harder to ensure that the full economic benefits of climate action will be reflected. The study should have enabled some reflection of the social costs and benefits of some of the options.

Given that the DME seems content to ignore externalities until they have been quantified in a study of their own making, a rigorous study that embraces full social costs and benefits of resource and technology choices is urgently needed. To achieve this it makes sense for government to invite labour to comment on the draft terms of reference, which have been undergoing revision for at least half a year, though this should not be used as another excuse for delay.

The civil society Energy Caucus, which includes several unions, has proposed a target of 15% of national

electricity generation from renewable resources by 2020 excluding imports from large dams. It also proposed separate and additional targets for solar water heating to displace electricity demand. The stock response is that this will cost too much – high returns are expected on capital while benefits from public health to avoiding depletion of fossil fuels and runaway climate change, are not reflected in economic terms.

The "too expensive" argument proposes that we should perpetuate market failure, often citing affordability of services for low-income households. The poor are already deprived of energy services by current tariffs and these are set to go up. A stepped block tariff becomes essential to make services affordable for the majority, even as costs increase and we address a range of market failures, including climate change, with co-benefits in public health and employment. ^{LB}

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