

Bearings for the biomass boom

■ DUNCAN MACQUEEN



Biomass energy is booming — more than two billion people depend on biomass for their energy and the International Energy Agency predicts that biomass' share of the global energy supply will treble by 2050. But in many developing countries it is still regarded as a traditional and dirty solution that is often criminalised, unsustainable and poorly paid. A more sophisticated approach that legalises and secures sustainable production by and for local people could help improve energy security, cut carbon emissions, protect forests and reduce poverty.



The case for biomass

Rising fossil fuel costs and fears about energy security are driving a global search for energy alternatives, particularly those based on renewable sources that can reduce carbon emissions and help tackle climate change.

Biomass energy — energy from plant or animal matter — fits the bill in many ways. Most biomass energy is based on wood. It is renewable and can meet rising demands as long as forests are locally controlled and thereby managed in a way that is sensitive to food security needs. If it is produced sustainably and burnt efficiently it is also low carbon. And new ways of converting biomass into energy are increasingly cost competitive with energy alternatives at a range of commercial scales.

There are other advantages too, particularly when it comes to meeting development goals. Biomass is accessible in even the poorest nations. Indeed, more than two billion people in developing countries already rely on woody biomass for their energy. Biomass can also be readily converted into all energy carriers (heat, electricity, liquid and gas), even using basic technologies. It is labour intensive across the whole supply chain, offering employment options to reduce poverty. And potential health risks can be cheaply and easily solved with more efficient processing and stove technologies.

Biomass energy already makes up ten per cent of the global energy supply, and more than three-quarters of the world's renewable energy supply. The International Energy Agency (IEA) predicts that by 2050, biomass energy's share of the world's energy supply will reach 30 per cent.

The developed world is embracing the opportunity with a fast-evolving range of serious and sophisticated approaches to biomass energy. In Austria, 80 per cent of new homes are equipped with wood pellet boilers. In Denmark, plans to become 'carbon neutral' in energy by 2050 include a doubling of biomass energy. And in the United Kingdom, plans to build new biomass power stations would expand demand for biomass from one million tonnes to 50–60 million tonnes (much more than the country can produce itself).

But developing countries are much less prepared. Many governments still treat biomass energy as traditional and dirty, viewing it as a backward poverty trap, a threat to forests and a health hazard. Control over biomass energy is usually delegated to forest authorities, who often simply criminalise its production. For example, in Malawi none of the near 100,000 people supplying charcoal to 93 per cent of the population have been issued with a charcoal permit.

Other countries rig production in favour of wealthy elites. For example, in Senegal, the forest department enforces quotas on charcoal supplies that have led to the 20 wealthiest charcoal merchants making an average US\$300,000 per year compared with an average villager receiving less than US\$3.50.

These approaches do nothing to either stem increasing demand for biomass energy or create a sustainable industry. Instead, they drive production underground into clandestine or, at best, unsustainable, poorly paid trade whose scale provides rich pickings for bribery and corruption.



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A new approach

Harnessing the potential benefits of biomass energy for development requires a new, more sophisticated, approach that legalises and secures sustainable production and processing by, and for, the millions of poor people who use biomass for energy.

In particular, this means putting biomass energy at the heart of national energy strategies and creating formal markets built on clear institutional mandates, secure biomass tenure rights for local people and strong investment in newer biomass technologies, including an active programme of research.

It is not impossible. And even in the developing world, we are starting to see one or more of the key ingredients needed.

Comprehensive biomass energy policies. For example, in Malawi, the government commissioned a Biomass Energy Strategy in 2009 which recognises that even with the most ambitious development of other energy sources, the country will still be 82 per cent biomass dependent in 2020 and charcoal production will still double by 2023 as populations rise. The strategy describes the need to quantify biomass use more accurately and make it more sustainable by providing clear incentives to increase biomass supply, create formal markets, improve the efficiency of end use, and enhance institutional capacity to oversee the strategy. While not yet approved, or integrated into thinking on climate change or poverty reduction, the new strategy marks the start of a more sophisticated approach to biomass.

Accurate biomass accounting. In other countries, international agencies are raising policymakers' understanding of the scale of biomass energy use and the potential rewards of legalising its production. For example, in Tanzania, a 2009 World Bank study showed that 80 per cent of the country's energy needs are met by fuelwood and that the charcoal sector generates an estimated US\$650 million each year. This is more than ten times the contribution of major cash crops such as coffee and tea to the national economy. Perhaps more importantly, the study suggested that unregistered or unregulated activities cost the treasury about US\$100 million in lost taxes every year. It would be unthinkable for any other industry to escape careful monitoring and tax collection by the state.

Such one-off surveys can help raise awareness but they do little to effectively monitor the sector in the long-term — for that, annual data on production and use are needed with regular surveys in yearly national energy plans.

Biomass energy in practice

Making biomass energy strategies work in practice also requires governments to provide clear biomass tenure rights. The simple truth is that people will not plant or manage biomass sustainably unless they can be guaranteed commercial returns from their activities.

Clear biomass tenure rights and incentives. In Niger, efforts to clarify biomass rights and responsibilities over the past two decades have nearly doubled the number of rural fuelwood markets, and increased the extent of managed forest. The legislation, brought in in 1992, focuses on: directed markets, where specific areas have annual harvesting quotas for deadwood, as agreed with the local community; and controlled markets, where a detailed forest management plan allocates management parcels and harvesting quotas for greenwood. The legislation also abolished the fuelwood-cutting permit and instead levies tax on firewood transport, some of which returns to local forest management funds.

Investment in technology research and development.

If secure tenure is important to make biomass energy work for development, so too are clear incentives and strong support for technology and research. India, a global leader in renewable energy, has already shown how investing in support measures for new biomass businesses can pay dividends. Such support includes waiving industrial clearances for new renewable energy industries, a five-year tax holiday for renewable energy power generation projects, and soft loans for renewable energy equipment manufacturing. The results have been impressive. Several thousand small-scale biomass electricity plants have begun to serve off-grid rural communities under initiatives such as the India Remote Village Electrification Programme. Benefits include both a new energy supply and many job opportunities in producing and processing wood for energy.

India is not the only country actively supporting biomass energy. A recent analysis by Bloomberg New Energy Finance concluded that in 2009, governments worldwide subsidised renewable energy and biofuel industries by up to US\$46 billion, through feed-in tariffs, tax credits, cash grants and other direct subsidies. Not bad! But the sum seems pitiful compared with the US\$557 billion that the IEA estimates governments spent in 2008 to subsidise the fossil fuel industry. With concerns over energy security and climate change, inequities of this sort should no longer be tolerated. If governments want to effectively harness the potential of biomass, it must be treated fairly compared with other energy sources.

Next steps

Putting these four ingredients together — comprehensive biomass energy policies, accurate biomass accounting, clear tenure rights and incentives for biomass production, and investment in technology and business research and development — has the potential to deliver energy security, emissions reductions, sustainable forestry and poverty reduction. Small advances are being made in some of these areas to harness biomass energy more effectively across the developing world. But we need to massively scale up these efforts and fill the gaps to realise the true potential of biomass energy.

The full report Bundles of energy: the case for renewable biomass energy can be downloaded at <http://pubs.iied.org/13556IIED.html>.

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