



Energy

The power to change lives

PRACTICAL ACTION
Technology challenging poverty



The power to change lives

Even today, in the 21st century, millions of people living in developing countries have no access to modern energy. This means they can't switch on a kettle, turn on a lamp, or power a fridge. They must rely on traditional methods of lighting, heating and cooking – methods that are often unreliable and hazardous.

Lack of modern energy can have a huge impact on people's livelihoods – for example without power for welding equipment you can't run a bicycle repair shop – services of which are in great demand in Sri Lanka where bicycles are a main mode of transport. For people like Bebi Nona Sayawerage in Sri Lanka, poverty takes away her choices: how she cooks, how she travels, where she lives, what she eats. The list is endless. At Practical Action, we are working hard to put the power in the hands of the people who need it. The right low-cost technology changes life for the better in so many ways and opens up possibilities for people like Bebi. *"What I would really like to do is open some kind of shop – a business of our own"* she says.

The Practical way

There is no "one size fits all" answer, which is why we don't start with the technology, but with the people who use and benefit from it.

Practical Action begins by talking to the people we are working with. What are their energy needs? Do they have the knowledge and skills to keep the technology going? Can it be fixed and maintained? As women often have the main responsibility for providing and using energy in the home, Practical Action ensures that women are fully involved in planning and managing energy projects in their communities.



A child reading by candlelight.

Energy and Poverty: the facts

- **one person in every three depends on wood, dung or crop residues for cooking fuel.**
- **traditional fuels are becoming increasingly scarce.**
- **a quarter of humanity still has no access to electricity.**
- **more than 1.6 million people die every year from illnesses caused by wood smoke from cooking fires.***

By using simple credit schemes, with funds from local people or donors, energy projects can get off the ground. It is the initial capital costs that are prohibitive – so community groups borrow from these funds to buy the technology they need. The money is repaid once the energy scheme is up and running enabling another group to be helped with start-up costs. With Practical Action providing technical support this type of scheme has transformed the lives of over 25,000 rural villagers in Peru where they have set up and maintain their own micro hydro schemes.

With Practical Action's know-how, the community take up of energy-efficient stoves in Bangladesh has exceeded even our expectations. Nearly twice as many people are using the improved stoves than we anticipated. These are stoves that are safer, burn nearly 50 per cent less fuel, and have less greenhouse gas emissions than traditional stoves. Practical Action is working with more communities providing training on how to build the stoves using local materials – a great idea that keeps on growing.

Power in the hands of the people

Practical Action has a strong reputation and expertise in biogas, wind and hydro energy technology. In recent years the impact of our work has helped many poor people improve their quality of life by providing a greater range of energy technologies. Here are just a few of those practical answers ...

Smoke from cooking stoves kills. Almost four million people die each year from respiratory diseases. Nearly half of all these deaths are caused by the smoke from traditional open cooking fires – many are women and children. That's one fatality every twenty seconds.

In the poor neighbourhoods around Kisumu in Western Kenya, Practical Action is helping families install smoke hoods, fuel efficient stoves, and simple improvements to the building's design. Larger eave spaces in the roof and small windows to improve ventilation, have been hugely beneficial for people like Rispa who know only too well the dangers of smoke. *"I used to cough all the time and have watering eyes now I can sit comfortably by the fire. I am much happier now".*

There are small, remote villages in Peru, Sri Lanka and Nepal that used to live in darkness after nightfall. Not any longer – since Practical Action worked with the communities to introduce small wind turbines to charge vehicle batteries, evenings have become a family affair. These batteries power household lights and radios, enabling children to study after dark, and provide communities with access to vital news and information.

Practical Action continues to promote small hydro schemes that generate up to 500 kilowatts of power. The micro hydro station, which converts the energy of flowing water into electricity, provide poor communities in rural areas with an affordable, easy to maintain and long-term solution to their energy needs.

In Sri Lanka biogas units installed as a viable alternative energy source to the destructive and expensive reliance on wood fuel are proving to be a great success. Mr Ratnayake is one such success story. With training and advice from Practical Action he installed a biogas unit and is using manure from his two cows to produce the power he needs. The dried manure left after the biogas process makes a rich, organic fertiliser that can easily be sold at market or used to fertilize his crops.



"The dung from two cows is enough to provide power so we can do all our cooking, light the house, and even heat the iron. I now have power all year round – and better harvests too".

Bringing people on board

Building on our grassroots experiences and recognising the millions of people suffering ill health or even death as a result of indoor air pollution we have sought to raise awareness of the danger of smoke in the home and how simple technologies can save lives. In three countries Kenya, Nepal and Sudan a 'Forum for Action on Smoke' has been formed to influence government health policy. Practical Action is also raising awareness about the dangers of smoke through the Partnership for Clean Indoor Air.

Based on our practical experience, Practical Action has published a report, 'Smoke; the Killer in the Kitchen,' calling for international action to address the problem. We've joined forces with others to develop and promote affordable technologies that save lives by reducing people's exposure to smoke.

Our work also looks at how sustainable energy can be a solution to reduce poverty worldwide. There is a growing consensus that modern, clean, sustainable energy is central to reducing poverty and hunger, and improving long-term health. These solutions don't cost the earth and are becoming increasingly linked to the current debate on Climate Change. They bring the benefits of energy without adding to greenhouse gas emissions. This is one of the messages we are taking forward to the UK government through our membership of the Stop Climate Chaos coalition. Increasingly people's access to energy is vital if we are to achieve the Millennium Development Goals of halving poverty and improving health.

Project in Action



Charging a battery from a small wind generator in Sri Lanka.

Wind power in Peru and Sri Lanka

Practical Action has been working with communities that live in isolated rural areas of Peru and Sri Lanka. The National Grid does not reach these communities. Instead, villagers depend on kerosene lamps (that are expensive to run and can be easily broken causing serious accidents and burns), wax candles and vehicle batteries to light their homes.

Every week, the batteries have to be recharged at centres a considerable distance away. Not only is the journey long, across difficult, rugged terrain, but recharging is an expensive business. For many villagers in these isolated areas wind power offers the perfect solution. Small wind turbines with fibreglass blades can be made with cheap, locally available materials and can be easily maintained by the people. The turbines harness the wind's energy to charge batteries, lighting homes long into the evening. Electric lights are brighter, safer, cleaner and cheaper to run than kerosene lamps.

Children can study in the evenings and villagers spend so much less time travelling to recharge their vehicle batteries. Instead, they can use their time more productively, often earning more family income and enjoying more family time. *"Now we have lights from six until ten in the evenings before we didn't have any. Now my children can study for longer. It's easier for me to do household chores. We've got more time now so we can be more productive and earn more"* says Sisira Rajapaksha.



Woman and child by cooking fire with a newly installed smoke hood.

Project in Action

Smoke, health and household energy

Across the world smoke from kitchen fires kills 1.6 million people every year. In communities around Lake Victoria in West Kenya, Practical Action is helping villages to share ideas about cooking in a different, safer way. The installation of smoke hoods and fuel efficient or bottled gas stoves, and the simple improvements to the building's design – such as larger eave spaces under the roof and small windows to improve ventilation – have brought huge benefits. Changes like these have reduced smoke by about two-thirds.

In Kassala, Eastern Sudan, Practical Action has been working with the internally displaced communities to research and monitor the effects of indoor air pollution levels. During this time some households used liquid petroleum gas (LPG) cookers, which proved to be more cost effective and also reduced the level of indoor pollution by up to 80 per cent. By working in partnership with a local women's organisation a revolving credit scheme has been set up to enable families to access funds to purchase an LPG cooker. People like Zienab have seen the benefits of this. She says: *"I am no longer suffering from the eye infections and headaches that used to attack me. Financially, I also benefit from cost savings, I used to spend SDD 50 per day on charcoal, while the LPG cylinder costs me about SDD 400 and lasts for three weeks"*.

And in Nepal, where stoves are used for heating as well as cooking, the problem has been attacked from all angles: the insulation of walls to retain heat; smoke hoods to remove smoke; and improved stoves to reduce firewood demand. Lemma Tamang says *"Now we can keep warm and cook, with no worries about what the smoke is doing to the children"*.

Photography: Ian Capewell, Crispin Hughes, Zul, Nigel Bruce

Future directions

For Practical Action, the way forward is to continue to build on Schumacher's vision. We will take every opportunity to develop and promote energy technology that is appropriate, affordable and sustainable.

Future plans include

- expansion of sustainable energy sources like biofuels, wind, solar and hydropower give a safe, clean energy supply without adding to greenhouse gas emissions.
- build the capacity of local communities, other organisations, and local decision makers to take up appropriate energy technologies.
- continue to highlight the ongoing danger of indoor air pollution by raising awareness of the health risks.

Further information

If you would like to know more about energy and development, Practical Action's work in general please contact:

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