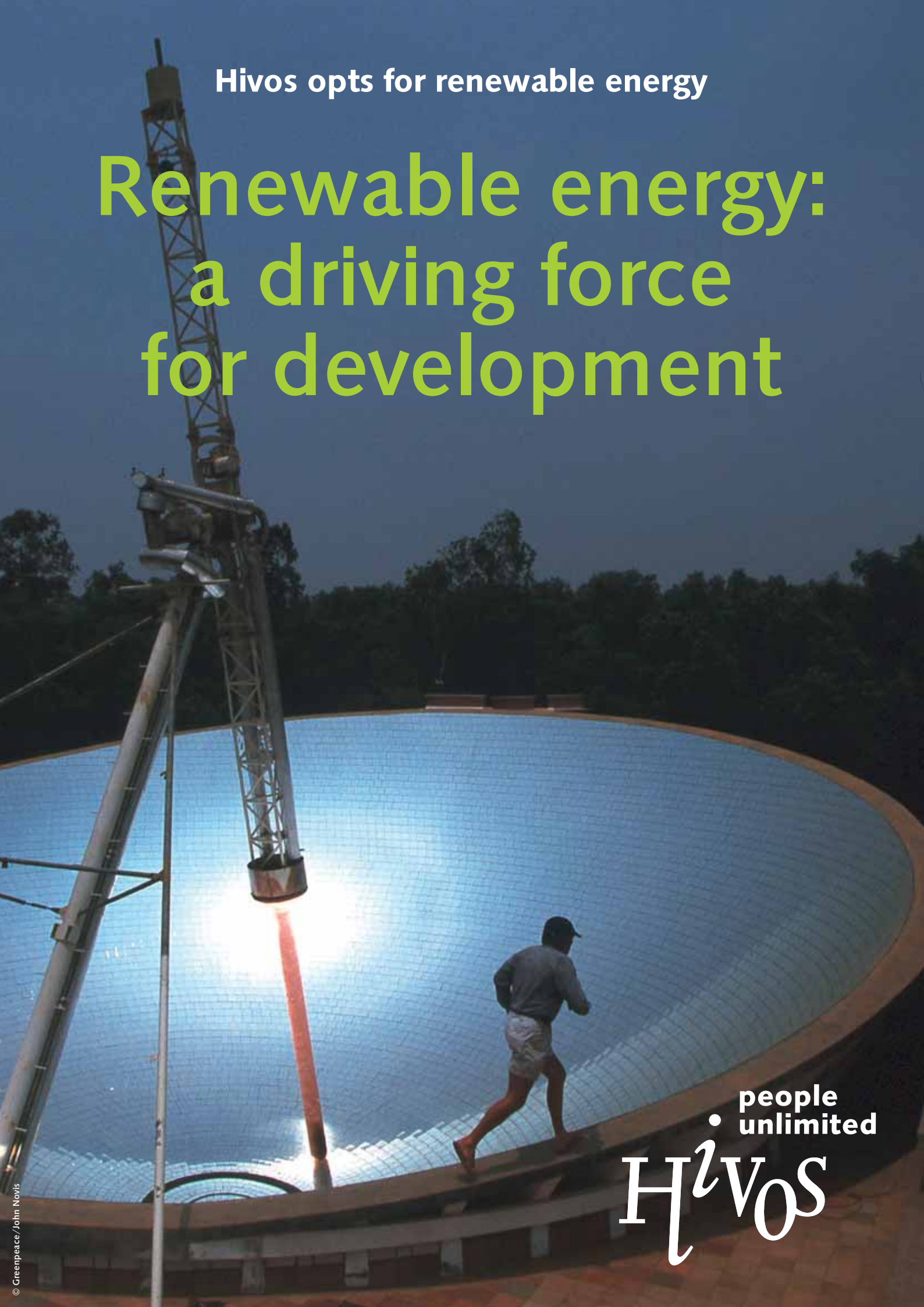
Hivos opts for renewable energy

Renewable energy: a driving force for development



people unlimited

Hivos

Contents

Hivos is a Dutch non-governmental organisation inspired by humanist values. Together with local organisations in developing countries, Hivos seeks to contribute to a free, fair and sustainable world in which citizens – women and men – have equal access to the resources and opportunities for their development. And where they can actively and equally participate in decision-making processes that determine their lives, their society and their future.

Hivos believes in the creativity and capacity of individuals. Quality, co-operation and innovation form the core concepts in Hivos' philosophy. Hivos is committed to the poor and marginalised in Africa, Asia and Latin America. A sustainable improvement in their conditions is the ultimate benchmark for Hivos' work and efforts. The empowerment of women is an essential concern in all its programmes.

Which choice will we make?

If climate change has made anything clear it is this: the Netherlands and other rich industrialised countries have been living beyond their means. Our economic growth is based on vast CO_2 emissions, and we are starting to feel their effects. This has disastrous consequences for the lives of poor people in developing countries and that is unacceptable. We simply cannot continue along this path. But how should we proceed?

If we really want to halt climate change, we have to make choices. Will we deplete the earth's reserves even more? Or will we make a choice for people and for nature, and for the intricate relationship between the two? It would seem at times that hesitant world leaders do not fully realize that we have only one earth. That life here will simply come to an end for us if we do not modify our way of living.

This one earth is what unites us, in the North and in the South, as people. We will have to manage life together, on this one planet. Only when we are united can we tackle global problems like the climate crisis – the biggest environmental problem of our century. People in developing countries are already experiencing the impact of climate change. But the Netherlands, too, is preparing for a massive rise in sea level.

A solution for the climate problem calls for radical changes: policies that go well beyond clean energy subsidies and energy saving light bulbs. But it is possible – as we will show you in this brochure. So, what will we do? Will we take the short-term business as usual approach, or will we act on behalf of our earth's future?

Hivos has made its choice – as have the partner organisations presented in this brochure. Our choice is 100 per cent renewable energy and efficient energy solutions. It is an answer to the climate problem as well as an answer to poverty. Hivos opts for clean, decentralised energy sources which poor people can have access to themselves. It allows them to shape their own lives, as it gives them access to an indispensable source of development – energy.

Manuela Monteiro
Executive Director

Climate change and sustainable development

'Climate change is already here,' Iván Azurdia exclaims when asked how we can prevent climate change. 'In my country, Guatemala, people are dying of hunger because of prolonged drought.' According to the World Bank they are among the millions in Latin America who are suffering increasing water shortages. If the average global temperature continues to rise by about 1.2°C the number of Latin Americans affected will increase to at least 10 million.

© Greenpeace / Peter Caton. India, West Bengal.

Natural disasters and melting glaciers

In other areas of the world the consequences of climate change are also hitting developing countries the hardest. Over half of the natural disasters in Africa are already related to climate change.
The Andean glaciers, a source of water for millions of people in South America, are disappearing at ever higher rates.
And if the nocturnal temperature rises by 1°C, in South East Asia the rice yield will drop by 10 per cent..

Poverty

Every day, people in developing countries are faced with the consequences of climate change on a daily basis. This is a violation of their human rights, Hivos believes. Of all groups in society, poor people depend the most on their natural environment or basic food prices. A shorter rainy season or greater unpredictability of the weather could potentially wipe out the livelihood of small farmers or nomadic pastoralists. Food prices will soar as a result of poorer harvests. In short, climate change is inextricably linked to poverty alleviation and economic development.

Women

Women make up the majority of poor people. So women are even more vulnerable to the consequences of climate change. They are the ones who work the land and are the first to feel the effects of drought or salination of their fields. They have to walk further and further from home to collect water or firewood. But women also play a pivotal role in restoring communities after climate disasters and helping them to adapt to a changing climate. After a succession of floods, women in Bangladesh and India switched to farming other crops and other farming methods and started building elevated storage areas for the harvest.

Rich industrialised countries

Hivos believes that the responsibility for climate change lies squarely with rich industrialised countries. They became wealthy through industrialisation, a process that has emitted billions of tonnes of greenhouse gases. Surely the poorest people in the world cannot, should not, be expected to pay the price for this? And yet this is exactly what has been happening for many years: precisely those countries that have hardly contributed to global warming are the hardest hit by flooding, extreme drought and devastating hurricanes.

Costs of climate change

A recent report by the Economics of Climate Adaption Working Group[1] predicts that climate change could cost developing countries up to 19 per cent of their GDP by 2030. But this need not be the case, say the researchers, as these countries can prevent a lot of economic damage by taking effective adaptation measures. However... that requires money and the willingness of rich industrialised countries to share their technological knowledge.

Promises are promises?

Rich industrialised countries seem to find it hard to loosen their purse strings when it comes to protecting poorer countries against the consequences of climate change. Under the 1992 Climate Convention they made agreements on this, at a price tag of 125 billion dollars a year. In 2001, the deal had already been adjusted downwards to 410 million dollars. Two years later, only 20 million of that had been transferred. A poignant comparison is when, in that same year of 2003, thousands of people died in France in an unprecedented heat wave. The French government had no difficulty releasing 748 million dollars to prevent a repetition of this disaster.

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1. ECA is a partnership between Global Environment Facility, McKinsey & Company, Swiss Re, Rockefeller Foundation, ClimateWorks Foundation, Europese Commissie and Standard Chartered Bank.

Rapid transition required

Several greenhouse gases are contributing to the rapid warming of the earth, but the main cause of harmful climate change is the vast quantities of CO_2 we are emitting. This is caused mainly by polluting power plants, transport, industry and global deforestation. Evidently we have to do something about this, but how, who, where and when? It is a topic of never-ending negotiations. One thing is as clear as daylight, though: without a rapid, large-scale transition to renewable energy sources we will not be able to lower CO_2 emissions fast enough.

Climate solution

Developing countries are already contributing to a climate solution. They still have vast expanses of tropical rainforests that are an enormous storehouse of carbon. Per capita developing countries emit a fraction of the CO_2 emitted by rich industrialised countries. They also produce clean energy from wind, hydropower and solar or geothermal power. The Netherlands has a 20 per cent clean energy target by 2020. Impressive? Not really; 38 per cent of Honduras' current power plants do not run on fossil fuels.

Driving force for development

Hivos opts for 100 per cent renewable energy, both in the Netherlands and in developing countries. Energy is a vital driving force for development. Access to energy can alleviate poverty, improve living conditions and propel economic development. However, continuing along the fossil fuel route to harmful climate change will have disastrous effects, especially for developing countries. Hivos would much rather stimulate sustainable development fuelled by clean energy.

Renewable energy in the South

Naturally we do this the Hivos way, that is: we join forces with local organisations and share our knowledge and expertise. Projects undertaken benefit poor and marginalised groups, giving them more control over their own lives. This is why Hivos prefers small-scale, decentralised energy systems. Key to this approach is equal access for women and men to resources and development, and so also to renewable energy.

Hivos in the Netherlands

In the Netherlands Hivos urges people and businesses to consume less energy and to switch to clean energy. In association with other organisations we lobby for renewable (energy) policies by national and international governments. We also offer companies and private individuals the opportunity to assume their share of responsibility through the Hivos Climate Fund. This Fund sells emission allowances from renewable energy projects to companies and private individuals in the Netherlands, enabling them to offset their residual greenhouse gas emissions.

Energy Scenario: fair, feasible and affordable?

Hivos opts for 100 per cent renewable – a superb choice. But the key question is: is this realistic? Hivos believes it is. We base this confidence on research conducted for Greenpeace by the renowned German Aerospace Centre in association with some 30 scientists from around the world. This has resulted in the Energy [R]evolution Scenario.

© Paul Langrock/Zenit/Greenpeace

Basic principles of the renewable energy scenario

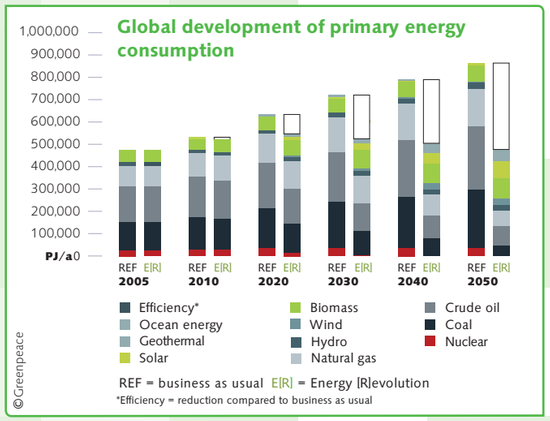
1. Equal access to energy for all.
2. Decentralised, reliable and affordable energy systems.
3. Gradual phasing out of fossil fuels.
5. Worldwide economic growth.

Iván Azurdia is absolutely right – climate change is already here. But we still have time to reverse course. If the earth heats up by more than 2°C on a global scale (since the industrial revolution) the consequences will be disastrous and irreversible, according to IPCC, UN's climate panel. If we are to halt this progression, CO_2 emissions should peak no later than 2015 and rapidly decline by at least 80% below 1990 levels by 2050.

Rapid transition

The energy scenario demonstrates just how quickly CO_2 emissions can be cut. We rapidly switch to renewable energy sources and efficient modes of transport. We deploy smart, energy-saving technologies, both in our homes and in industry. And we produce the energy as close to the user as possible, from local energy sources. Wind from the North Sea in the Netherlands, for example, and hydropower from fast-flowing rivers in Indonesia.

Global development of primary energy consumption



Fully sustainable

Global CO_2 emissions from the energy and transport sectors can be halved by 2050, according to this sustainable energy scenario. Between 2080 and 2090 the whole world will be able to generate its energy from renewable sources, while economic growth steadily rises. There is even room for rapid economic growth in regions like Africa, China, India and Brazil. By no means is this scenario a castle in the air: it only uses available, proven technology.

Redistribution of CO_2 emissions

In addition, the scenario envisages redistribution of global CO_2 emissions. At present, rich industrialised countries are responsible for most of the CO_2 emissions. In the energy scenario the distribution will have shifted substantially by 2020: poor and developing countries, where a large part of the world's population lives, will account for two-thirds of emissions.

Smart technology

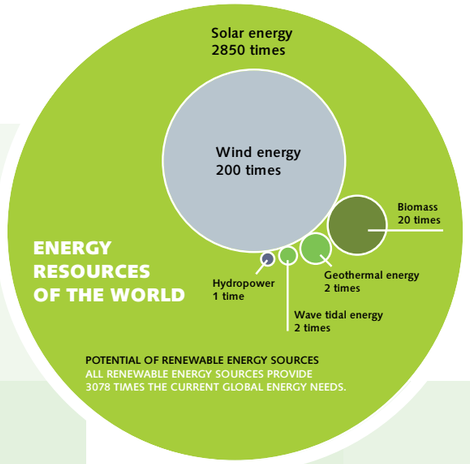
Energy consumption in rich countries can be cut substantially by using smart technology that is widely available. Energy saving light bulbs, standby killers, insulation and efficient production processes can make polluting coal plants redundant. If we go for the sustainable energy scenario, energy consumption in rich countries will drop by 10% in 2020. In developing countries, where many people have little or no access to energy, energy consumption will rise by 20%.

Growth in developing countries

Stimulating economic growth in developing countries while reducing CO_2 emissions is the sure way to go. It is the fossil fuel route that is costly and uncertain: dwindling oil and coal reserves will undoubtedly drive price rises. What we see in operation here are the constraints of a head start. Rich industrialised countries are having to invest heavily in making their industries and transport systems CO_2-free. Developing countries are in a better position to embark on the sustainable path and save costs in the long term.

Vast potential

We have a vast potential for clean energy sources. The wind blows with 200 times the force needed to power global consumption. One day of sunlight is enough to supply the world with eight years of electricity consumption. With today's technology, only a fraction of that can be converted into power.
Yet – in the sustainable energy scenario – that fraction alone will supply 32.5% of the world's electricity in 2020. It will be derived mainly from solar and wind power, closely followed by new technologies such as concentrating solar power, geothermal power and ocean power. In 2050 the share of renewable energy will have risen to 50 per cent.



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Temporary natural gas

Politicians and (energy) companies must now fully engage in the process of renewable energy and energy efficiency. They have simply started the transition to renewable energy sources too late. This means that there is currently insufficient capacity for an immediate transition to solar, wind, hydro and geothermal power. The energy scenario therefore opts for natural gas as a temporary supplement. Natural gas is significantly less polluting than coal and oil, especially if it is combusted in high-efficiency turbines. Moreover, a gas plant can be 'switched on' much more easily, for instance when there is less wind.

Worldwide we would need only one third of our current electricity use, if we could prevent all the wasted power in buildings, agriculture and industry.

Close to the user

Our energy production must undergo radical revision. We must abandon large-scale conventional electricity plants and generate energy closer to the users, in other words, decentralised. Where possible we must choose renewable, locally available energy sources, whether it is wind, solar, hydro or geothermal power. Thanks to combined heat and power systems, the heat generated from energy production can be used immediately.

City and industry

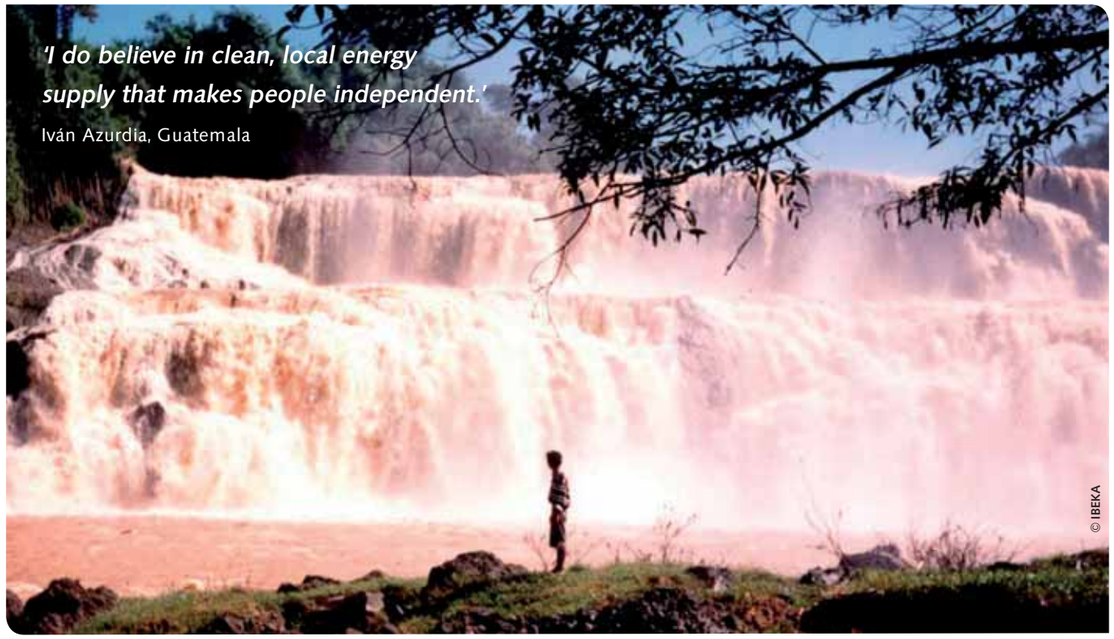
Sustainable solutions are also available for large-scale applications, such as in cities or on industrial sites. Solar panels, combined heat and power systems and energy-efficient buildings provide on-the-spot energy. Further away, offshore wind parks and technology such as concentrating solar power offer great potential.

Nuclear energy and carbon capture

Hivos does not consider nuclear energy or carbon capture and storage (CCS) effective measures to tackle the climate problem. Nuclear energy is hazardous, generates waste that remains radioactive for 240,000 years and provides the raw material for nuclear weapons. CCS cannot yet be applied on a practical scale and the risks are unknown. Ongoing development costs a lot of money, which would be better spent on clean energy sources. Onsite CCS at coal plants is not a good idea. After all, we want to do away with them.

How much does it cost?

What does this energy scenario cost? If you look purely at the cost of the investments needed (e.g. in smart technology and renewable energy sources) the costs would appear to be higher in the energy scenario: until 2030, 14.7 trillion[2] dollars will be needed, compared to a 'mere' 11.3 trillion dollars in investments for business as usual. However, the energy scenario also represents a huge profit of 18.7 trillion dollars. How is this possible? It's quite straightforward: renewable energy sources do not require costly fuel. A coal plant cannot run without expensive coal, but once wind turbines and solar panels have been installed, they predominantly generate cash. In all, the energy scenario is much cheaper – so it is a very profitable investment. Moreover, this scenario creates millions of jobs worldwide.

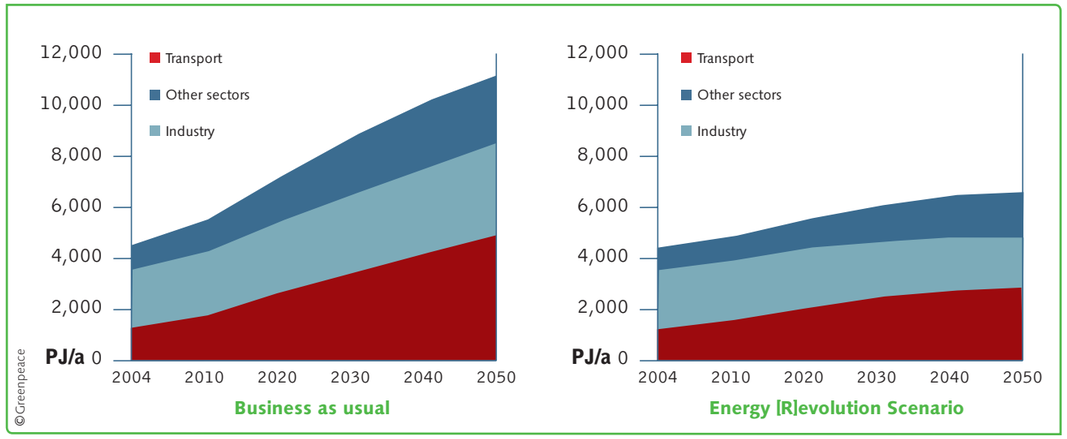


2. 1 trillion = 1,000 billion

An example: Indonesia

Sustainable energy scenarios have also been drafted at regional and national levels. These can be found on www.energyblueprint.info. An example is Indonesia, where the demand for energy is set to rise sharply – that also cannot be avoided in the energy scenario. But in this scenario energy consumption in Indonesia is significantly less than in business as usual. This is possible thanks to smart energy technology and savings in the transport sector. This means that less energy is required for the same activities (transport, production).

Indonesia: projection of total final energy demand by sector



Indonesia will be able to produce more than 60 per cent of its electricity from renewable energy resources by 2050. Increasing energy efficiency and switching to renewable energy sources will reduce Indonesia's long-term costs for electricity by about 30 per cent. Indonesia's sustainable energy strategy until 2050 in this scenario is:

1. Coal plants are to be replaced by high-efficiency gas turbines and geothermal plants.
2. Renewable energy capacity will increase from 5 GW to 78 GW in 2050. Until 2010, biomass and hydropower will be the main sources of energy, after which geothermal power will play an increasingly significant role. As from 2020, solar panels will play a major role, particularly in providing remote villages and over 6,000 islands with access to energy.
3. For environmental reasons, only small-scale hydropower plants will be built. In 2050 these will generate an aggregate estimated 12,000 MW.
4. Only agricultural waste will be used as biomass, also for environmental reasons (mainly deforestation), which will generate some 5,000 MW in 2050.

Lobby for a sustainable energy policy is essential; given the long investment cycle in the energy sector, political decisions have to be made right now.

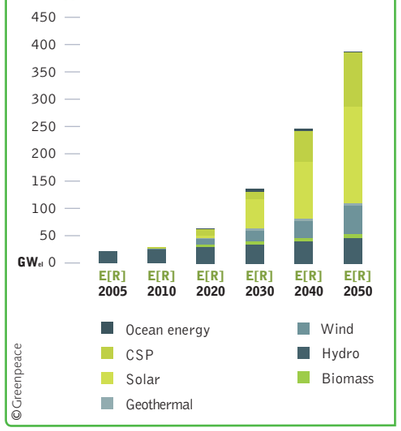
An example: Africa

Another example is Africa, where the demand for energy is rising exponentially. Business as usual means more than a twofold increase in current demand (more than 200 per cent) in 2050. But in the sustainable scenario consumption 'only' rises by 50 per cent, thanks to energy-saving measures. Over half of this is generated from renewable energy sources. High-efficiency vehicles in the transport sector and a shift from road to rail transport will generate significant energy savings.

Africa will be able to produce 73 per cent of its electricity from renewable energy resources by 2050. An important incentive for solar plants is the supply of electricity to rich industrialised countries. In this energy scenario electricity will be cheaper than in the business as usual situation. In 2050 the electricity price will drop by as much as 9 cent/kWh for sustainable electricity supply. By then, the total costs of generating electricity will be a third lower than in business as usual.

By 2050, heating (cooking, hot water) can be a 72 per cent sustainable activity in Africa. Thanks to energy efficiency, the energy demand for heating and cooling will drop while living conditions will improve. The industrial sector will increasingly use concentrating solar power, geothermal power and biomass.

Africa: growth of renewable electricity generation capacity under the Energy [R]evolution Scenario



Hivos and partners: we choose renewable energy

Hivos partner organisations in developing countries are faced with the consequences of climate change on a daily basis. They also lack access to energy, which is absolutely essential to poverty alleviation and development. Yet they do not stand idly by but take the task to hand and organise their own renewable energy supplies. Solar panels and small-scale hydropower plants supply remote villages with electricity. Energy-efficient stoves and biogas plants ease women's workload. Our partners choose clean energy sources that reduce the emission of greenhouse gases and at the same time improve people's living conditions. Hivos is proud of these partners and wholeheartedly supports their sustainable initiatives. Six partner organisations enthusiastically talk about their renewable energy projects in the following pages.

© Godfrey Sanga

Clean and economic cooking

Coughing while trying to avoid smoke: many women in Tanzania have to cook over an open fire. This is bad for their health and bad for the environment. Thanks to TaTEDO energy-efficient stoves this smoke is now drawn through a chimney. The stove saves a lot of wood and also saves time for the women: they no longer have to walk for kilometres on end to collect wood.

'Our stoves are very important for poor people,' director Estomih Sawe explains. 'The smoke is extremely unhealthy for women and children who stand over open cooking fires. I recently read that 1.6 million people worldwide die prematurely as a result of inhaling smoke from wood fires. An efficient stove prevents the release of CO_2. It also means that less forest is cut down – there's so little of it left to begin with.'

Like a bushfire

'The first designs appeared in the 1990s. Today, more than 1.1 million people use our efficient stoves. Over 2,000 small producers are making and selling the stoves and earning a living from this. Yes, you could say that the technology has spread through Tanzania like a bushfire,' Sawe smiles.

Local design

'Our stoves come in all shapes and sizes. What they look like is determined locally, especially by the women who use them. What kind of food do they usually cook, how big are their pots? We also have industrial-size stoves, for instance for schools or hospitals. Women's groups that have bought our stoves are now earning some extra income through the sale of fresh bread rolls!'

Knowledge sharing

'TaTEDO is an organisation that develops and shares knowledge about renewable energy. We don't install all the stoves, but we supply the technical know-how so that others can apply it. With the support of Hivos we have launched a pilot project in ten villages. Around 6,000 households will be getting our new, efficient stove. It is a closed model that saves 60 per cent more wood than the older models.'

Stove builders

'Experience in previous projects has shown that people in the villages find it difficult to change their cooking methods. Initially they do not see why they should change their methods, so we put a lot of effort into education. We generally take the same approach in all the projects: we demonstrate the benefits of our stoves and train the people who will build and maintain them. Once everything is up and running, we can leave it in their hands. Over the years we have established a sizeable sector of stove builders.'

Efficient and affordable

'Of course, 100 per cent renewable energy is very much what we want. We still depend mainly on coal and oil. Decentralised renewable energy sources like solar, wind and hydro power are more efficient and affordable, but on condition that people master the technology. For this reason, TaTEDO applies the same approach for solar panels, solar boilers and small hydropower plants as it does for its stoves: training, promotion and knowledge sharing.'

Facts and figures

Wood saving per stove: 60 per cent.
Annual CO_2 saving: 3.2 tonnes per household.

Climate change in Tanzania

Tanzania is among the top three African countries that have been affected the most by climate change. The rural economy in Tanzania is very vulnerable. Water supply will become irregular and competition for pastoral land will increase. A temperature rise of 2°C can decrease the maize yield by 33 per cent. Malaria has spread up to the foot of the Kilimanjaro.

© Thomas Mkunda

© Harrie Oppenoorth

Cattle and pigs make clean energy

We don't normally associate cattle and pigs with clean and hygienic. But in Cambodia their manure is used for clean energy and improved health. In addition, the emission of methane, a potent greenhouse gas, is strongly reduced. The motor behind this development? Biogas plants.

Around 5,800 farming families in Cambodia cook on biogas supplied by their own cattle and pigs. Before the small-scale biogas plant was installed they would cook their meals over a wood fire. This is expensive, unhealthy and bad for the environment – and, as the women point out, 'cooking with biogas is much faster'. The farmers are also happy with the residual product: slurry that is a good fertilizer for their rice and vegetables.

Satisfied farmers

'We have been working on the project for over three years, with the help of Hivos and SNV, and farmers with a biogas plant are very satisfied' says coordinator Lam Saoleng of the National Biodigester Programme (NBP). 'Reliable', they indicate in surveys, and 'exceeds expectations' they say of the yields. The training we provide – how does the plant work, what must you do – is also well received. They are realising significant savings on the costs of firewood, petroleum and batteries – this money can now be put towards school fees, food and investments in their farming business.'

Microfinance

'The poorest groups have no cattle and very little land, so for them a biogas plant is not an option. Our target group consists of small farming families who use petroleum lamps and cook on wood. Farmers who, with an investment subsidy from the NBP, can invest some cash in the plant.'

Facts and figures

First project stage: 18,500 biogas plants for approx. 92,500 people.
Realisation: approx. 5,800 in October 2009.
Annual CO_2 saving: 6 tonnes per plant.

Climate change in Cambodia

Cambodia will face more flooding as well as more droughts. Irrigation systems will cease to function because of the drought and this will affect rice production. People are already suffering food and water shortages. Malaria and dengue fever will become more widespread. Cambodia was one of the first countries to introduce a National Adaptation Program of Action. One example: the country estimates that it will need 10 million dollars to protect main roads and other infrastructure against flooding and extreme weather.

20 kg of manure

'To keep the plant running you need at least 20 kg of manure per day, and for this you need at least 2 cows or 8 pigs. But the yield increases if you connect toilets to the plant. Not surprisingly, the number of farmers with a water toilet is growing. They have understood the benefits, not only in terms of increased yield but also of improved hygiene!'

Huge potential

'Of the 14 million inhabitants of Cambodia, almost 12 million live in rural areas. This is a huge potential, since a quarter of all farmers have enough cattle for a biogas plant. Just consider the gains: every farmer supports around five family members. They no longer have to inhale the fumes of oil burners or wood fires. Their cattle provide clean energy.'

Realistic price for CO_2

'We do not have much renewable energy yet in Cambodia, it is simply too expensive for our country. The whole world 100 per cent renewable? Possibly, if rich countries are prepared to pay a realistic price for their CO_2 emissions and make it possible for developing countries to switch to renewable energy. However, the Clean Development Mechanism that is responsible for organising this internationally is much too complicated. I only see possibilities for clean energy on a large scale if this is simplified.'

© P. Wiggers/Panos Pictures

Natural gas in rural areas

Ethiopia is one of the developing countries that still uses little gas or electricity. Access to energy is a rare commodity, especially in rural areas. 'Every village, every household is entitled to electricity', according to director Ato Kahisu of EREDPC, the organisation that implements the biogas programme in Ethiopia.

'In our country the demand for energy is also growing rapidly, at an annual rate of about 25 per cent. Ethiopia imports a lot of expensive oil and produces very little energy, so the government is also very interested in our biogas plants.'

Two-day walk

'Most cities are connected to the electricity grid, but in rural areas almost no one gets electricity from a household socket. Light comes from oil lamps or candles. Women do the cooking on wood fires. So much forest has now disappeared that they sometimes have to walk for two days to collect enough firewood!'

Cow pats

'For rural inhabitants, biogas plants are the ideal solution. They offer a two-sided advantage, or in fact three. Biogas does not give them watering eyes or pulmonary infections. Biogas plants are time-saving. Biogas eliminates the need to buy oil or fuel bricks. There is even a fourth advantage: hygiene. Cow pats that used to litter the ground are now collected and used in the biogas plant.'

An example: Asia

'We are learning a lot from the experiences in Asia. I visited Nepal, where 200,000 of these biogas plants have been built. That's not surprising, though, as SNV started there as early as 1993. We have only recently started promoting biogas in Ethiopia. We have already built 110 plants and our target is 400 by the end of this year.'

No shortage of cows

'There is no shortage of cows, as Ethiopia has a lot of cattle. We also have water, so the preconditions for a biogas plant are present. The only problem is that the cows are sometimes very thin. A farmer needs six cows instead of two to produce enough manure.'

Wanted: microcredit

'The biggest problem is that farmers often cannot afford a biogas plant. We are doing everything we can to arrange microcredit facilities for these farmers, but that's easier said than done. In fact, biogas plants are very profitable and thanks to the savings they generate, farmers can repay their loans.'

Job opportunities

'As in Cambodia, we want to establish a biogas sector. People like contractors and masons can earn money building the plants and help us to promote biogas. Biogas can give an enormous boost to employment. I believe that poverty alleviation and local, renewable energy are an auspicious combination.'

Cities and industry

'One hundred per cent renewable? We can do it, but we have to include both small-scale and large-scale energy plants. Our cities and industries also need electricity. More often than not, our large hydropower plants lacked water. This is why Ethiopia has also started building wind parks.'

Facts and figures

Hivos, SNV and DGIS jointly set up the Africa Biogas Programme.
Objective for 2010-2030: 70,000 plants in Sub-Saharan Africa, 14,000 of which in Ethiopia.

Climate change in Ethiopia

The rainy seasons in Ethiopia are getting increasingly shorter while the dry seasons become increasingly longer. People are starving, they have to sell their cattle and their crops are failing. In 2007, children under five were already at a 36 per cent higher risk of becoming undernourished as a result of poor harvests caused by climate change.

Water as a driving force for development

Got to do homework, bah! In the Netherlands it is at the bottom of many schoolchildren's list of priorities. But in Chel, a remote Mayan village in Guatemala, the children are genuinely happy that they get to do homework. Thanks to the micro-hydropower plant there is now light in their homes in the evening. Electricity is now within everybody's reach. What's more, it is cheaper than the oil or batteries the residents use to have to rely on.

Iván Azurdia is one of the motivated initiators of this renewable, local energy supply. 'No matter how small, the hydropower plant is a true driving force for development. When I first came to Chel seven years ago, there were no roads, no health clinic, no mobile telephones – there was nothing. Now there are sixty small businesses and even a hotel. Water from the river provides power for some 2,500 people in three communities. And we're expanding! Seven more villages would like to join us.'

© Consultores Energéticos

Access to development

'The indigenous population of Guatemala has always been marginalised. It does not occur to the people in power to give them access to electricity or any other form of development. We support their access to electricity and thereby their access to development. It is clearly their development, however, in their own unique manner and in tune with nature.'

Ancient Mayan trees

'It's not just about the hydropower plant. Our project combines clean energy with socioeconomic development. This is the only sustainable way. All users pay for their power consumption. They helped build the plant and are jointly responsible for its maintenance. Using the proceeds, the villagers finance small reforestation projects, with ancient Mayan trees like rámon and campeche.'

Vaccines in the refrigerator

'The people have changed. They are learning how to read and write. Their lives go on in the evening and they enjoy this. The shop recently acquired a photocopier and this in turn attracts new trade. Vaccines and medicines are kept in refrigerators in the health clinic. Almost everyone now has a mobile phone and there is a GSM antenna. Before they had to travel two to three days for a telephone call.'

Batzchocolá

'With Hivos' support we are building a small micro-hydropower plant in Batzchocolá, which means 'where the water is born'. Soon the hydropower generated will feed a school, a small shop, a joinery business, a sugar mill and the coffee processing plant. In the evening people will have light and during the day there will be power for small businesses. Here too, three villages are working on the construction of the plant. And we will be doing this in many more places!'

Independence

'I don't believe in a solution for the climate problem, but I do believe in clean, local energy supply that makes people independent. More than anyone else, the Mayans know the land and nature here. We have to reverse the roles now: we can – we must – learn something from the indigenous population so that we can survive in a changing climate.'

Facts and figures

Capacity per hydropower plant: 90 – 110 kW.
Electricity for 6 villages near Chel and Batzchocolá.
Annual CO_2 reduction for the two plants: approx. 400 tonnes.

Climate change in Guatemala

As a result of climate change, Guatemala will face declining rainfall levels, prolonged periods of drought and more violent hurricanes. Hurricane Stan has demonstrated what the long-term consequences can be. At the end of 2005 it raged across the Guatemalan highlands and affected over half a million people, mainly Mayans. More than 1,600 people were killed. A year later most of the survivors had not succeeded in reconstructing their lives; small farmers could not resume production. In the meantime food prices had risen, which meant that many people went hungry.

Independent thanks to hydropower


© IBEKA

Director Tri Mumpuni of the Indonesian organisation IBEKA is a passionate individual. If necessary she will travel the world over to convince governments and NGOs of the importance of clean, renewable energy sources. And just how important it is for those sources to remain under the control of village communities. Yet she is also aware of how difficult this can be.

'In the past 20 years we have built over 60 micro-hydropower plants in Indonesia. Big ones of around 500 kilowatt and very small ones with a capacity of only 200 Watt. The villagers own the plants and everyone pays for the electricity. This does mean that they have to maintain the plants themselves. One of the problems is the rates, which sometimes have been set too low. This means there will not be enough money to cover the costs of repairs and spare parts. So we are preparing the villagers for their future tasks – as owners they have to feel responsible and manage their plant well.'

Working evenings

'Once a hydropower plant is up and running properly, the community really starts to prosper. Women who work in the rice fields during the day can carry out other activities in the evenings that need light. Drying peppers, lemongrass, pressing oil... all sorts of activities that provide them with additional income.'

Money for education

'IBEKA has built a small plant in Cinta Mekar, where the inhabitants are even earning money from the generated power. The village does not need all the electricity and sells the excess to the energy company. The inhabitants have set up an organisation that decides how the money earned this way will be spent. Some 130 children are now attending school, women are getting microcredit for small businesses and poor families are receiving free health care.'

Nature conservation

'IBEKA wants to build as many small hydropower plants as possible. They provide power to residents of remote villages who would otherwise never have had access to energy. Now they have their own electricity! They are independent, and you can see the result: the plants really do improve these people's lives. They also take care of their natural surroundings. A hydropower plant can only continue to provide energy if water continues to flow, and this is only possible through nature conservation, by planting trees in the catchment area. The villagers are conscious of this interrelationship.'

100 per cent dedication

'Yes, 100 per cent renewable energy is realistic. Together we will make sure that it is viable in the near future. It is possible, but only if we are all fully dedicated to this goal.'

Facts and figures

IBEKA hydropower plants: electricity in approx. 60 villages.
Capacity per plant: 200 Watt – 500 kW.

Climate change in Indonesia

In Indonesia climate change will result in more frequent and violent heat waves, flooding, droughts and extreme weather. Increasingly, rain is failing to fall when this is essential for agriculture and coming down in torrents at unsuitable times. Dwindling food production is resulting in hunger and malnourishment. Forest fires are increasing in frequency, destroying nature and causing pulmonary problems. Diseases like malaria and dengue fever are spreading over greater areas, particularly in high temperatures and in the rainy season. Ocean water is heating up and the sea level is rising, putting many more people at risk for flooding.

More food thanks to biofuel

For many years biofuel was seen as an ideal alternative to CO_2-emitting gasoline and diesel. But a few multinationals ran off with this dream. They occupied food-crop land, cut down tropical rainforests and set up colossal biofuel plantations. Biofuel acquired a bitter taste.

We will do things differently, Hivos partner STRO (Social Trade Organization) decided. Peter Moers, coordinator in Central America: 'Oil from the jatropha nut is a sustainable alternative to expensive, polluting diesel. This crop can be grown commercially on large plantations, and it is indeed being done. Aircraft builder Boeing is very interested in this alternative fuel and has already made test flights with jatropha oil. However, we want to develop a local market for this biofuel: small-scale agro-industry, water pumps, cars, buses... Farmers can grow their own fuel!'

Oil and manure

'Jatropha plants have significant benefits. Mature plantations require little maintenance and also do well without irrigation. What remains after you've extracted the oil from the nut is a cake that is a very good natural fertilizer. Farmers can simply plant the bushes between their maize and beans – in other words, it is an added bonus that is not grown at the expense of food crops.'

Factory

'Our pilot project Gota Verde ('green drop') involves 200 farmers. Over half of them are also shareholders in BYSA, the factory that processes jatropha nuts into biodiesel. They own the land, the bushes and the factory that processes them.'

Credit facilities

'Jatropha is also the driving force behind the credit facilities for small farmers. Did you know that in Honduras only 30 per cent of agricultural land is farmed? This is because many farmers cannot get a loan. Banks are afraid that the small farmers will eat up their entire harvest and have nothing to sell. But BYSA can get hold of credit and in turn, extends loans to the small farmers for their maize crops. With the proceeds from the jatropha crop they can repay the loan. Here food production is actually increasing thanks to biofuel!'

Oil price

'Jatropha oil will only really be profitable if the price of oil increases again. That Hivos has decided to go ahead and invest in this demonstrates their visionary approach. Oil prices will undoubtedly rise again as fossil oil reserves start to run dry. Just precisely when this will happen is an uncertain factor in this project. When the oil price rocketed in 2008 we were suddenly the focus of attention. Requests poured in from across the world: can you set up a plantation here as well?'

Independence

'Is '100 per cent renewable' realistic and feasible? No, not without another sustainable solution: energy saving. The demand for energy is only set to increase, and this demand cannot be met by clean energy sources alone. We will therefore also have to consume energy more efficiently. Producing and consuming locally already saves a lot of energy. What's more, it makes you more independent. Just look at the farmers here. In May 2008, just before the rainy season, there was a major shortage of diesel in Honduras. Many farmers had to postpone ploughing, but the farmers of Gota Verde were able to go ahead as usual. Thanks to their own jatropha oil.'

Facts and figures

Pilot: 3 years, 200 ha. jatropha plants.
Number of farmers: 200.
Estimated yield: 4,000 kg/ha = 1,100 litres of oil (after 5 years).

Climate change in Honduras

As a result of climate change, Honduras will face more frequent and devastating hurricanes and floods. As hurricane Mitch (1998) has shown, this will have dire consequences for poor people. In order to survive immediately following the disaster many poor people had to sell their possessions, including those that earned them a living. Therefore, their poverty only worsened: they produced less.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Climate solution: we can. So why is it not happening?

Cutting CO_2 emissions before the climate is irreversibly pushed over the edge? We can. And we should: a rapid transition to renewable energy sources and efficient energy consumption is crucial for a climate solution. But governments, businesses and citizens often make choices that go entirely against this.

Governments

Rich industrialised countries are not doing enough – that's clear. Few energy policies have sustainability as their top priority. Many developing countries, particularly if they have fossil fuels, do not put renewable energy at the forefront of their policies either. Yet it is they who are being hit the hardest by the consequences of climate change. All too often – encouraged by established institutions like the World Bank and the IMF – they still subscribe to western growth models featuring coal plants and expensive oil.

Urgency

There is great urgency to act now, especially for developing countries. Limiting the global temperature rise to 2°C above pre-industrial level doesn't solve their problems. Small island states could be flooded before the two degree-limit is reached. And for Africa this global limit means a regional temperature rise of 3 to 4°C! Even the relatively conservative International Energy Agency (IEA) has issued a warning that every year of delay in switching to renewable energy will cost the world 500 billion dollars.

No matter how logical it seems to choose renewable energy, politicians often look no further than the next election. According to the British climate expert Lord Nicholas Stern, author of the famous 'Stern Review report on the economics of climate change' (2006), the costs of climate change will add up to 20 per cent of global GDP, whereas investing in a climate solution will cost only 1 to 2 per cent. So are politicians eager to support major investments in sustainable alternatives? Hardly.

The Netherlands emits more than 170,000 thousand tonnes of CO_2, while Malawi only emits over 1,000 thousand tonnes.

Expensive technology

Under international agreements (the Clean Development Mechanism, CDM) rich industrialised countries do not have to meet all their CO_2 targets in their own countries. Instead they can also set up renewable energy projects in developing countries, which they are keen to exploit. This would seem an ideal option, as it gives developing countries access to the latest sustainable technologies. But often, rich industrialised countries finance projects that would also have been implemented without their support. Moreover, the companies that carry this out generally go for the safe and profitable options, which means that there are few of these CDM projects in the poorest countries. So in practice, the expensive technology patented by those companies is not accessible to the poorest countries.

Energy security?

Energy security plays an important role in opting for sustainable: dependence on oil, coal and gas is a highly unstable factor in government plans for economic growth. For the many poor people living in rural areas, too, energy security is a major advantage of decentralised, renewable energy sources. They need not count on the big energy companies. The priorities of the political elite seldom include the needs of the poorest groups. Even if they do manage to get connected to the grid, there are so many power failures that their schools and businesses can hardly function.

No more greenhouse gases!

The sustainable energy scenario calculates the CO_2 savings we can make by radically rethinking our energy and transport systems. But we can do much more! If we use all the possibilities at our disposal, in 2050 the emission of greenhouse gases could be as much as 90 per cent lower than business as usual. What is needed for this?

- Stop deforestation and manage forests sustainably.
- Sustainable agriculture.
- HFC-free refrigerators, air conditioners and other appliances.
- Waste prevention and recycling.
- Use of climate-friendly technology in industry and ongoing innovation.
- A different consumption pattern and lifestyle.

Businesses

Where governments often fail to take action, citizens and businesses have a crucial role. Can we rely on the industrial sector in rich countries to save our climate? Unfortunately, here too we hear many promising words from businesses, but do not see enough structural change. They often opt for the lowest production costs without considering polluting energy sources such as coal plants. What's more, the European industry successfully lobbied at EU level for exemption from CO_2 emissions trading, so they can continue to emit large amounts of CO_2. The car industry also managed to significantly lower European CO_2 targets.

Corporate responsibility

Businesses are responsible for the CO_2 emitted by their production processes and their products. Fortunately a growing number of businesses are taking this responsibility seriously – businesses that lead the way, do not wait for government measures but choose renewable energy and efficient energy consumption of their own accord. But they are still in the minority – and more than ever before, the world now needs businesses to switch to energy-saving measures on a massive scale. They must also use the best clean technology available on the market, both in rich industrialised countries and in developing countries.

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'Rich countries should pay a realistic price for their CO_2 emissions and make it possible for developing countries to switch to sustainable energy'

Lam Saoleng, Cambodia

Energy companies prefer fossil fuels

Although energy companies play an important part in the solution for the climate problem, across the globe the vast majority are not stepping up to the mark. In developing countries and emerging economies, too, energy companies are predominantly choosing fossil fuel – large-scale and centralised.

The power being wasted by North American and European households combined is about 18 times the total required to run all African households.

Citizens

In 2008 almost 21,000 people in 21 countries were asked the following question by WorldPublicOpinion: Do you think your government should put more emphasis on renewable energy? Even if this increases the costs of energy in the short run? Surprisingly, in most cases the answer was 'yes', whether those polled were from Nigeria, Argentina or South-Korea. Over three quarters believed that policymakers should invest more in solar and wind energy. Two thirds expect that this will save money in the long term. Support for sustainable energy solutions was only significantly lower in oil-producing states like Indonesia and Russia.

New appliances

Many citizens are fully aware of the need to save energy and start using renewable energy sources in order to counteract climate change. But often this awareness does not lead to energy-saving actions. Many new electronic devices are using so much energy that all the energy savings from economical washing machines and refrigerators are being cancelled out. Companies must use the best available technology in, for instance, their electronics. But citizens in rich industrialised countries must, just as rich people in the urban centres of the South, reduce their consumption standards. It is in rich countries that energy consumption is still rising the fastest, despite all the tales about the massive amounts of CO_2 emitted by industrialising developing countries. By 2020, energy consumption will be 2 to 3 times as high per capita in Europe, the US or Australia than in India or China.

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What does Hivos want?

Hivos, in partnership with local organisations in developing countries, wants to contribute to a free, fair and sustainable world. Access to renewable energy for all brings that world closer. This is why we support the initiatives of our partner organisations but also encourage energy efficiency and a rapid transition to sustainable energy in the Netherlands and worldwide.

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Government

Across the world, the climate discussion is dominated by rich industrialised countries and emerging powers like China, India and Brazil. Their needs and interests come first; they determine whether the climate will be saved. Even when discussing the opportunities and possibilities of renewable energy, governments and big corporations in rich countries have an overriding say. The energy technologies in which they invest have the future. The solutions they choose will prevail throughout the world.

Choices for the poor

Hivos opts for a different approach altogether: what do the poor and marginalised of this world actually want? Which solutions best serve them? Renewable, decentralised energy production plays a key role in counteracting climate change and promoting access to energy for marginalised groups. Governments must therefore unequivocally choose renewable, locally available energy sources – both in their own countries and across the globe. Together with its partner organisations, Hivos opts for small-scale, decentralised energy supply. But large-scale energy generation for industry and cities will also have to be sustainable. We know that the technology is available, but what it comes down to is this: what choices will governments, energy companies and businesses make?

No time to wait

Hivos urges rich industrialised countries around the world to assume, with the greatest haste, their responsibility for the current climate crisis. Hivos supports the demand of over 100 countries at the UNFCCC meeting in Copenhagen, to limit the global temperature rise to 1.5 degrees above pre-industrial level. Governments must radically reform their energy sector, make a large-scale transition to renewable energy sources, adapt electricity grids and encourage energy efficiency. We must not wait and see what 'the market' does or wait for final agreements at UN level. Without financial incentives the market hardly moves forward and everyone waits to see what the others do. We simply do not have time to wait much longer.

Climate aid

Given their climate debt, rich industrialised countries must release a substantial amount of funding for climate aid as well as renewable energy projects. According to estimates by the World Bank, these countries should contribute an annual 110 billion euros towards climate aid for developing countries – in addition to the existing development budget that is indispensable for poverty alleviation. In Copenhagen 100 billion dollars have been promised – a promise that should be realised swiftly.

Clean investments

In addition, governments must give a strong impulse to investing in renewable energy sources. Whether these are soft loans or feed-in tariffs , it is crucial that these incentives are long-term and fixed. Only then will it be worthwhile for private individuals, companies and banks to invest in renewable energy sources. No right-minded company will invest in solar energy if the government changes the remuneration for solar energy every year. Wind parks at sea will not get off the ground if banks cannot recoup their investments with a guaranteed profit.

Businesses

Governments must create conditions, provide incentives, establish a level playing field and set clear requirements on businesses. However, this does not release businesses from the responsibility they shoulder for the climate. What should their contribution be? A radical reduction in emissions of CO_2, methane and laughing gas! They can innovate and apply existing climate-friendly technology to considerably reduce their energy consumption as well as their waste. The ICT sector alone – according to its own sources – can save on 15 per cent of worldwide CO_2 emissions thanks to technological innovation.

Advantages

Worldwide a growing number of businesses assume that responsibility. They also realise that this is in their own best interest. In the long term most businesses, like everyone else, will feel the effects of climate change. Because they have to pay for their CO_2 emissions, because their raw materials are becoming scarce or because insurers demand increasingly higher risk premiums. In fact, one of the driving forces behind a climate solution is Munich Re. This reinsurer (fore)sees an increase in the number of 'natural disasters': major loss items due to the consequences of climate change. Conclusion: climate change is also a disadvantage in financial terms. Businesses that choose to invest in renewable energy sources will have the advantages of a secure energy supply and independence of fossil fuels.

Free technology

Big international companies can no longer protect their technological knowledge and their patents. If they are truly concerned about climate change they will share their knowledge and make their technology freely available. A consortium of 12 European companies intends to erect enormous solar plants in the Sahara that will use concentrating solar power (CSP) technology. The idea is for Europe to get as much as 15 per cent of its electricity from the Sahara by 2050. As admirable as it seems as a sustainable alternative, is it also fair, i.e. will the companies supply energy to the rest of Africa too? Will the solar power be available for the poor, local population?

Switch now

Energy companies hold an important part of the solution for the climate problem. Investments in this sector often take place decades ahead of production. This is why governments and energy companies must decide now to switch to renewable energy. A number of developing countries has already taken important steps in this direction. China is the world's biggest polluter, for example, but it is also investing substantial sums of money in wind and solar parks. And India, although it is building coal plants, is also stepping up its solar capacity considerably. Poor countries like Ethiopia and Kenya are also choosing to make relatively big investments in geothermal and wind energy. There are multiple benefits: no transport loss, fewer costs and greater supply reliability. Wherever possible, energy production should also be decentralised to give poor people in rural areas, islands and in remote mountain areas access to energy.

Citizens

Like businesses, citizens should also bear their share of responsibility. Many people in rich industrialised countries are quite concerned about climate change but find it difficult to abandon the harmful consumption patterns they are accustomed to. In developing countries millions of people aspire to this consumption pattern: if they had the money they would also buy a plasma TV and fly to a wonderful holiday destination – logical of course.

Consumption pattern

That is not an option, however. If we want to save the climate across the world we must modify our consumption patterns. Rich industrialised countries must cut down significantly on consumption and developing countries must realise that they cannot copy 'western' consumption patterns. More and more people want to reduce their emissions by flying less frequently, not using their cars as often and not buying the latest electronic gadgets. Hivos partner organisations are setting a good climate example. They are building their own hydropower and biogas plants as well as investing in efficient stoves. They are organising their own sustainable future. In the industrialised world a good example is the British '10:10' campaign that unites people, organisations and businesses behind the idea of together reducing the country's CO_2 emissions by 10 per cent in 2010.

Hivos Climate Fund

In a fair climate solution, development and renewable energy go hand in hand. Hivos partners show us how this can be done. Small-scale projects? Yes – but with big prospects. In China there are already 20 million biogas plants and in India there are around 4 million. Over 200,000 households in Nepal cook on biogas and Vietnam has 60,000 plants to which some 2,000 are added each month.

Future in their own hands

The Hivos Climate Fund gives businesses and citizens the possibility to compensate for the CO_2 emissions they cannot avoid or for energy they cannot generate sustainably. This could be an air trip, a server or a collection of electrical appliances. Not by planting a forest that may not be there in a couple of years, but by investing in renewable energy projects that truly benefit poor communities. Thanks to this Fund, children, women and men in developing countries can provide their own renewable energy, thereby improving their living conditions themselves.

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Colophon

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Text & photography: Tekstproducties Jacqueline Schuiling
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people unlimited

Hivos

More information:
www.hivos.nl
www.hivos.nl/eng/climate

Hivos Head Office
P.O. Box 85565
2508 CG The Hague
The Netherlands
T +31 (0)70 376 55 00
F +31 (0)70 362 46 00
E info@hivos.nl

Hivos Regional Office Southern Africa
20 Phillips Avenue Belgravia
P.O. Box 2227
Harare
Zimbabwe
T +263 (0)4 706 704
+263 (0)4 727 197
+263 (0)4 706 125
F + 263 (0)4 791 981
E chuma@hivos.co.zw

Oficina Regional América Central
Del Centro Comercial Plaza Mayor
320 este, sobre el Boulevard Rohrmoser,
Pavas
San José
Costa Rica
T +506 231 08 48
+506 296 07 06
F +506 232 29 74
E hivosro@hivos.or.cr

Hivos Regional Office for Southeast Asia
Jl. Brawijaya Raya No. 12A
Kebayoran Baru
Jakarta Selatan 12160
Indonesia
T + 62 21 724.4432
F + 62 21 723.0774
E hivos@hivos.or.id

Hivos Regional Office India
Flat no. 402, Eden Park
No. 20 Vittal Mallya Road
Bangalore - 560001
India
T +91 (0)80 2221 05 14
F +91 (0)80 2227 03 67
E hivos@hivos-india.org