Power to the People

Sustainable energy solutions for the world's poor

PRACTICAL ANSWERS TO POVERTY

The World Summit on Sustainable Development offers a potential double win: reducing poverty without choking the planet. To achieve this there needs to be a global action plan to provide clean, sustainable energy to the world's poor.

Two billion people have no access to electricity and up to three billion depend on bio-mass (wood, charcoal and dung) to meet their household energy needs. Energy services have a critical role in achieving the Millennium Development Goals (MDGs). The UN Commission on Sustainable Development has called access to sustainable energy a "prerequisite" for halving poverty by 2015.

What is required at WSSD are strong intergovernmental commitments ('Type 1') on sustainable energy to complement voluntary partnerships ('Type 2') between governments, businesses and civil society groups.

Sustainable energy for cooking...

Nearly two million people, mostly children, die each year because their homes are polluted with smoke from cooking fires. Many people in developing countries spend up to a third of their income on energy, most of which is for cooking. Women spend up to three hours a day collecting firewood, walking up to ten kilometres and carrying 35kg of wood. More efficient stoves can reduce the amount of fuel used. In addition, simple, low-cost solutions to deadly indoor air pollution are available, including chimney stoves, smoke hoods, switching to cleaner fuels and improved ventilation.

- Provide one billion people with improved, clean stoves by 2015
- Halve the numbers of deaths from indoor air pollution by 2015
- Put in place reforestation programmes in order to create sustainable supplies of biomass

Getting renewable electricity to the rural poor...

Many of the two billion people who lack access to electricity live in rural areas that are far from transmission grids. Decentralised renewable energy options can use resources more efficiently, empower local communities, develop indigenous technological and manufacturing capacity and deliver strong environmental benefits.

- Provide electricity to one billion of those who currently lack access to clean energy by 2015 – at least two-thirds of this from renewable energy

Sustainable energy for the urban poor...

Urbanisation is one of the defining trends of the developing world today. Many poor people living in cities depend on wood and charcoal for fuel, which contributes to both air pollution and deforestation. In the short to medium term fossil fuels will continue to be the main alternative fuel for poor urban households. However, innovative technologies like solar water heaters, waste-to-energy and biogas need to be developed to deliver sustainable long term solutions.

- Put in place international and national strategies to assist the urban poor in the transition to cleaner and more sustainable fuels

Power to the People: a Ten Point Agenda for Change

To meet these challenges – clean energy for cooking, renewable rural electrification, sustainable energy to the urban poor – ITDG is calling for a ten point Agenda for Change

1. Put energy at the heart of poverty reduction strategies
2. Provide aid support to sustainable energy options for the poor
3. Shift trade and subsidy policies towards renewable energy
4. Develop financing mechanisms to reach the grass roots
5. Increase national capacity for sustainable energy
6. Leverage private sector partnerships to target the poor
7. Engage the poor as active partners in delivering change
8. Set up a decentralised international renewable energy agency
9. Agree a target of 15 per cent of global energy to come from renewable energy by 2010
10. Move towards tougher long-term global action on climate change

Energy is central to achieving the Millennium Development Goals...

Halving extreme poverty: freeing up time spent gathering fuel, increasing income and employment through enterprises that need energy (such as workshops, sawmills, welding and metalworking, etc).

Halving the number of people living with hunger: approximately 95 per cent of the food we eat has to be cooked, and most foods need energy for processing of some kind. Hunger is related to poverty, so efforts to eradicate poverty should help eradicate hunger. Energy is needed to process food (such as grinding cereals) and to produce food (such as water for irrigating agricultural land).

Achieving universal education: extended study opportunities in the evening, access to information and communication technologies and long distance learning materials.

Promoting gender equality: reducing drudgery of arduous tasks such as grinding and food preparation, increased opportunity for enterprise, opportunities for evening education due to lighting for night classes.

Reducing mortality/ improving health: through reducing indoor air pollution from household smoke, better health facilities through vaccination, refrigeration services and modern hospital equipment.

Ensuring environmental sustainability: conventional energy is a contributor to greenhouse gas emissions but newer cleaner technologies can provide a sustainable alternative.

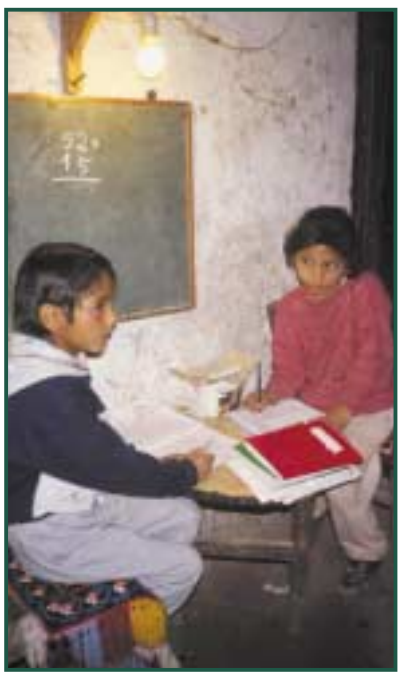
Energy, poverty and environment

Energy is the lifeblood of human society and economics. It cooks the food we eat. It heats our schools. It lights our hospitals. It powers our industries. It keeps us warm – or cool – in our homes. And for a majority of the world's people, turning on a light switch is something that rarely, if ever, requires conscious thought.

Yet over two billion people in the developing world today have no modern energy services. Eighty per cent of people in sub-Saharan Africa have no electricity. Access to basic, clean energy services is essential for sustainable development and poverty eradication, and provides major benefits in the areas of health, literacy and equity. The Millennium Development Goal of halving poverty will not be achieved without energy to increase production and income, create jobs and reduce drudgery. Improving health and reducing death rates will not happen without energy for the refrigeration needed for vaccination campaigns. The world's greatest child killer, acute respiratory infection, will not be tackled without dealing with smoke from cooking fires in the home. Children will not study at night without light in their homes. Water will not be pumped or treated without energy.

At the same time, the world faces another great challenge: the prospect of a climatic catastrophe if present trends of fossil fuel consumption continue. Heat-trapping gases such as carbon dioxide and methane that keep more of the sun's warming energy in the earth's atmosphere cause climate change. This is primarily caused by the industrialised world's fossil fuel consumption, although developing country emissions are rising quickly. Per capita emissions of developed country citizens are far higher than those of people living in developing countries: the average American produced 20 tonnes of CO_2 in 1998, compared to an Indian average of less than one tonne. The Intergovernmental Panel on Climate Change projects a substantial global temperature rise and sea level increase, and more extreme weather events such as floods, hurricanes, drought and heat-waves. Those most vulnerable to these changes live in the developing world.

Developing countries will feel these impacts most acutely, even though they also have the least responsibility for climate change. A range of effects consistent with climate change has primarily triggered the current famine in Southern Africa. Extreme weather events are growing stronger and more frequent, as recent years have shown abundantly in events ranging from the Orissa Cyclone in India and floods in Mozambique to Hurricane Mitch in Central America. Most tellingly of all, the people of Tuvalu – a tiny small island state in the South Pacific – have started negotiations with New Zealand for the evacuation of their entire population. Rising sea levels are salinising the country's low-lying cropland and making it unusable. Tuvalu is a sign of things to come.



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Energy is, then, fundamental to the great challenge facing the world at the beginning of the 21st century: how to eliminate the obscene levels of poverty without further polluting the planet or worsening climate change. ITDG believes that these two goals need not be in conflict – indeed, they can be achieved in tandem. There is a huge potential for renewable energy to provide clean, appropriate and efficient energy to the world's poorest. Millions can be lifted out of poverty without costing the earth, with the help of clean sustainable energy.

The Challenge

To best respond to the basic needs of the two billion poor people who lack access to modern energy services in a way that does not further damage the environment, ITDG has identified three key challenges for energy planners and policy makers:

Challenge 1: Energy for cooking

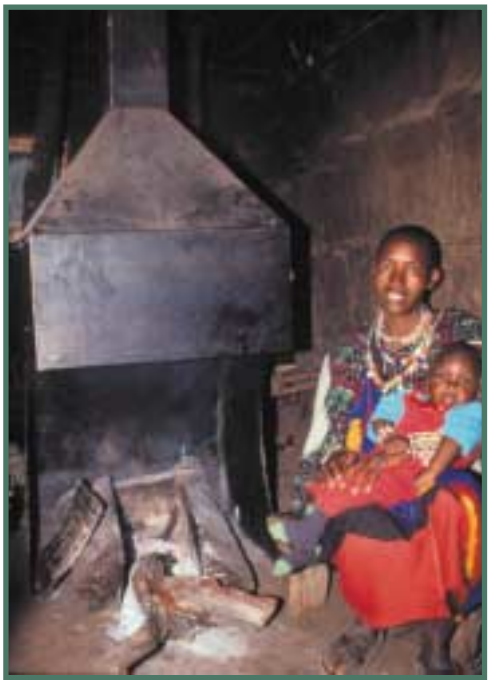
The first energy priority of people living in poverty is how to meet their household energy needs. Poor people spend up to a third of their income on energy, mostly to cook food. Around three billion people in the developing world use biomass, such as wood, dung, charcoal and agricultural residues, for cooking and, in cold regions, heating. Due to poverty and a lack of appropriate alternatives, many will continue to rely on biomass as their primary energy source for cooking in the foreseeable future. There is urgent need to establish and maintain a sustainable supply of wood and charcoal to people on a very low income. This will require widespread and sustainable reforestation programmes which directly involve communities.

Women, in particular, devote a considerable amount of time to collecting, processing and using traditional fuel for cooking, often spending up to three hours per day and walking up to ten kilometres to gather 35 kg of firewood – time which could be spent on child care, education or income generation. Reducing the amount of firewood or dung used through simple affordable technology, such as more efficient stoves, is vital.

Every year 1.8 million people die of illness related to smoke for cooking fires. Smoke is a major factor contributing to acute respiratory infection, the greatest single cause of under-five-year-old deaths. Simple, low-cost solutions to deadly indoor air pollution are available, including chimney stoves, smoke hoods, switching to cleaner fuels and improved ventilation.

There is an urgent need to address the continuing dependence on biomass for domestic energy by improving energy efficiency. ITDG is calling for a concerted effort, by 2015, to:

- ***Provide one billion people with improved, clean stoves***
- ***Halve the numbers of deaths from indoor air pollution***
- ***Put in place reforestation programmes in order to create sustainable supplies of biomass***



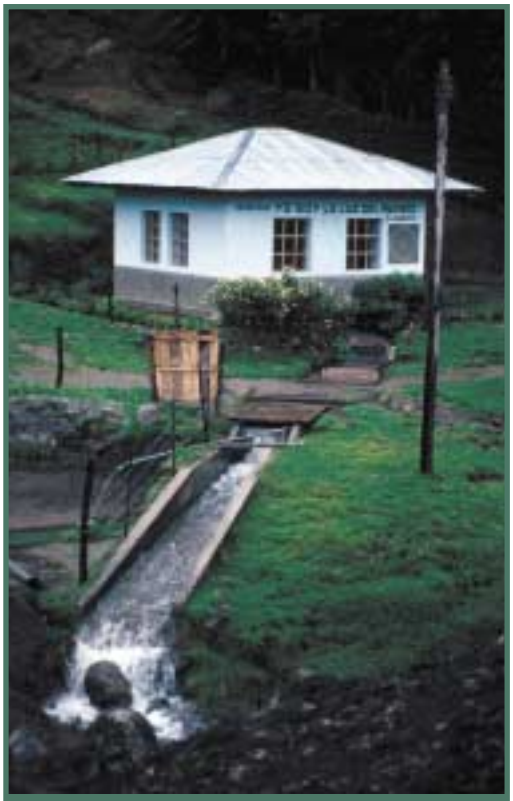
ITDG has worked with Maasai women in the Kajiado region of Kenya to find appropriate solutions to the extreme problem of air pollution in their homes – where average smoke daily levels were recorded at over 100 times the accepted international standards and several hundred times higher during cooking times. The women assisted in developing a simple smoke hood that, at a cost of less than $50, has reduced smoke levels in the houses by an average of 75 per cent.

Long term uptake and use of improved cooking technology will require:

- working with target communities to develop technologies which are appropriate and affordable to them
- effective marketing and promotion strategies, including micro-credit schemes, to encourage households to purchase the stoves
- ultimately, there should be viable businesses established which can continue to supply appropriate, good quality and affordable stoves to the community

As cooking is usually a woman's task this is generally not a priority for funds in a household. Women-to-women promotion of improved cooking technologies is best. They need to be convinced of the overall gains the new technology will give to the family. Micro-credit schemes can play a valuable role in facilitating roll-out of these technologies.

Challenge 2: Getting electricity to the rural poor



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ITDG has been using Inter-America Development Bank funds in Peru since 1994 to implement a "Revolving Fund" of soft loans, along with technical assistance on the construction of micro-hydropower schemes in isolated rural areas. So far 24 schemes have been completed under this scheme, with an average loan of $40,000 per scheme, benefiting more than 15,000 people. Loan repayments are fed back into the Fund to support new micro-hydro stations in remote villages.

A major challenge will be to provide electricity to the rural poor. Electricity is needed to power small industry and enterprise, run health clinics and light schools. Without it rural poverty will not be eradicated.

The conventional approach to electrification tends to marginalise rural communities who are located far away from the grid. Rural population densities are generally low and the cost of energy supply is high compared with densely populated areas. Electricity companies – public or private – have little incentive to provide services to these areas.

The options for decentralised rural electrification are either through diesel or renewable energy sources. Renewable energy has distinct advantages over diesel as it has much lower running costs, uses local energy sources, does not run out, is much cleaner and does not contribute to global warming.

Where centralised approaches have failed to reach the poorest communities, there is a need for a new approach based on small-scale sustainable energy options. Decentralised energy options can:

- make efficient use of local energy resources e.g. hydro, solar, biomass, wind. They can avoid the negative environmental and social impacts of large-scale projects, and remove dependency on costly supplies of fossil fuels or grid power
- make use of and develop indigenous manufacturing and technical capability
- harness the energies and resources of the community
- be controlled by local communities and their organisations, enabling them to identify their own needs

Relatively small investments are needed to produce or improve technologies that are within the reach of low-income communities. There are many examples of good practice in this field, such the ITDG micro-hydro programme in Peru, where funds from the Inter-America Development Bank have been used to supply power to over 15,000 people (see box). Also, in Inner Mongolia over 180,000 stand alone small wind generators are being used by households following a government initiative providing financial support to dissemination programmes. Success stories should be replicated, especially through South-South transfer of technologies and experience.

Providing electricity to one billion people who currently lack access by 2015, with at least two thirds of these from renewable energy technologies

About ITDG

ITDG – the Intermediate Technology Development Group – helps people to use technology in the fight against poverty. We work in partnership with communities to develop practical answers to their problems, based on local knowledge and skills and putting people's needs first.

ITDG is a charity registered in the United Kingdom which works directly in four regions of the developing world – Latin America, East Africa, Southern Africa and South Asia, with particular concentration on Peru, Kenya, Sudan, Zimbabwe, Sri Lanka, Bangladesh and Nepal.

ITDG has a unique approach to development – we don't start with technology, but with people.

The tools may be simple or sophisticated – but to provide long-term, appropriate and practical answers, they must be firmly in the hands of local people: people who shape technology and control it for themselves.

Challenge 3: Sustainable energy for the urban poor

Urbanisation is one of the defining trends in the developing world today. By 1999, 47 per cent of the world's population lived in cities, which is nearly four times as many as in 1950. Most of this growth has taken place in developing countries. Cities now generate three quarters of global CO_2 emissions.

Many poor people living in cities in the developing world are still dependent on traditional fuels (wood and charcoal) for their principal energy needs. Large concentrated populations draw significantly on scarce natural resources, most acutely in the areas surrounding the population centre. In many countries the cost of fuel wood and charcoal in urban areas is kept low, often due to government attempts to fix the price of wood fuel. This artificial selling price does not allow sufficient funds to return to the rural areas to cover the cost of re-planting the depleted biomass (trees). Priority areas for action include:

A small amount of energy can have a significant impact on income generation. For example, a $100 solar lantern developed by IT Consultants has extended the operating hours of a street vendor in Kenya by lighting her stall in a local market.

- Improving efficiency and sustainability of the supply chain for charcoal and fuel wood by creating strong incentives for replanting and reforestation, whilst ensuring that the interests of the poor are safeguarded. Replanting should use high standards of environment management in order to maximise biodiversity benefits and should where possible avoid single crop monocultures.
- Disseminating improved biomass cook stoves widely in urban markets.

Many poor urban homes share the same indoor air pollution problems as homes in rural areas. In the short to medium term fossil fuels will continue to be the main alternative fuel for poor urban households. The increased use of LPG (liquid petroleum gas) and kerosene is the most feasible way to improve air quality in the home and reduce the environmental damage of deforestation around cities in the short term. There are three barriers to providing fossil fuels to poor urban households for cooking, which must be overcome to ensure greater availability of LPG and kerosene:

- The lack of infrastructure for supplying these fuels in cities and towns of many developing countries.
- Poor households often cannot afford the up front cost of the cooking equipment, both the stove and the LPG canister – access to micro finance can be a powerful tool in this context.
- Many households currently purchase fuels on a day to day basis. Fossil fuels, particularly LPG, are supplied in bulk quantities which many households cannot afford to pay.

There remains a need for a longer-term strategy to ensure a more sustainable supply of energy to poor urban areas as the rural poor continue to migrate to the cities. To date there has been very limited development in this field, and there are few mature, viable sustainable energy technologies readily available, in particular for cooking. Some innovative technologies have been piloted in urban areas, for example, solar water heaters, biogas from agro-residue and night soil, and recycled waste to energy. To achieve a sustainable energy supply in urban areas, these innovations and many more need to be investigated, and the most effective ones then scaled up. LPG and cleaner biomass fuels will in the long run be just a transition towards full sustainability with minimal emissions of greenhouse gases.

ITDG is calling for international and national strategies to be put in place to assist the urban poor in the transition to cleaner and more sustainable fuels.

Power to the People: a 10-Point Agenda for Change

Addressing the three challenges set out above will play an invaluable role in delivering the Millennium Development Goals. To do that the World Summit on Sustainable Development must commit to a plan of action and clear targets to get sustainable energy to world's poor. This section sets out what needs to be done.

1. Put energy at the heart of poverty reduction strategies

There is general agreement on the need for a 'joined-up' approach to energy and poverty reduction. It is essential that energy strategies for poor people are incorporated into national and international development frameworks. In particular, national Poverty Reduction Strategy Papers (PRSPs) in developing countries should explicitly state the energy services required to achieve their poverty reduction goals.

2. Provide aid support to sustainable energy options for the poor

Development assistance must recognise that the principal energy need of the poor remains cooking. Bi-lateral and multi-lateral agencies should therefore provide increased support for clean cooking strategies in order to achieve the target of halving deaths from indoor air pollution.

The total grant funding from aid sources to subsidise the access of one billion people to electricity would average approximately $300 per electrical connection and less for fuel switching or low-pollution cooking methods.

The majority of this funding would need to be spent in Africa and South Asia. Assuming an average household size of five people, the total cost would be of the order of $4.6 billion a year until 2015 – this does not include the cost of fuel switching. The annual global subsidy for conventional energy is $250-300 billion.

Increased aid can deliver this figure – and it would be highly undesirable for it to be added to the existing burden of debt of the poorest countries. The WSSD has an opportunity for governments to commit to this level of grant funding and make a significant impact on the lives of the world's poorest and most vulnerable communities.

3. Shift trade and subsidy policies towards renewable energy

Bi-lateral trade, subsidy and export credit policies in the energy sector are currently focused overwhelmingly on large scale fossil fuel technologies. Trade policy must be redirected towards sustainable energy and the creation of a level playing field for renewable energy technologies, particularly by reducing import duties on renewable energy technologies.

The joint NGO 'Choose Positive Energy' campaign is calling for:

- Commitment by OECD governments to immediately target 20 per cent of their energy sector lending and support to renewable energies and energy efficiency in the form of guarantees via Export Credit Agencies
- Commitment by all governments to phase out subsidies to conventional energy, estimated at between $250 billion and $300 billion annually

4. Develop financing mechanisms to reach the grass roots

A critical factor in making sustainable, decentralised energy options accessible to poor people is affordability. The up front cost of new technologies, whether an improved cook stove or a micro-hydro power plant, is extremely high for poor people. Appropriate financing and subsidies can give low income communities, households or entrepreneurs the ability to afford to invest in new energy technologies. Achieving this aim will require a sustained effort by the international community, as well as new local partnerships involving NGOs and private sector. There are good practice models that can be replicated. These success stories must be learned from to produce 'smarter' financing models.

ITDG supports the G8 Renewable Energy Task Force and the UN Development Programme to call for changes in existing financing mechanisms to specifically target poor people, including the Global Environmental Facility (GEF) and the Clean Development Mechanism (CDM). The World Bank should continue to have a leading role through its people focused initiatives such as Community Drive Development and the Social Investment Fund.

5. Increase national capacity for sustainable energy

Developing countries need support in creating an environment in which renewable and sustainable energy technology can be effectively developed. The most urgent areas for capacity building in countries are:

- Basic national assessments of local resources for renewable energy. Without this, it is very difficult to plan for renewable energy development. Donor agencies should see this as a priority for external assistance.
- Technical standards for quality assurance in the renewable energy sector, to ensure reliability and consumer confidence in the technologies. Standards of service of electrical utilities may not be appropriate in areas of very low demand, and a lower quality (for example based on battery charging) may provide a great improvement in energy service at a lower cost than conventional grid extension.
- Business and technical training and strengthening of Business Development Service providers to support small and medium sized enterprise (SME) activity in renewable energy service and equipment supply.
- Encouragement to local finance institutions to target renewable energy as a sound investment.

6. Leverage private sector partnerships to target the poor

While developed countries are leading the way in increasing the viability of renewable energy technologies, there is a clear need also to support the development of local technical skills and knowledge needed in developing countries. The private sector – particularly in the technology and banking sectors – needs to be encouraged to form local partnerships to supply services which are accessible and appropriate to the poor. Again, mechanisms such as the CDM and the GEF should lead international policy by creating opportunities and reducing risks for the private sector to work along side entrepreneurs in developing countries.

7. Engage the poor as active partners in delivering change

People living in poverty must have their say in the prioritisation of energy options if energy policy and services are to meet their needs and provide long term solutions. In energy sector planning, as elsewhere, the poor themselves are too frequently the invisible stakeholders.

Evidence shows that if the primary stakeholders are involved in the design and implementation of development initiatives they are much more likely to bring prolonged benefits. Local communities possess invaluable local expertise that should be taken into account in defining and implementing any energy project. Projects characterised by high levels of community engagement will typically generate a greater sense of community empowerment, ensure that improvements are tailored to a community's specific needs, and create a much higher chance that the improvements will be well maintained by the community after installation.

8. Set up a decentralised international renewable energy agency

A new international renewable energy agency would be another invaluable tool in assisting implementation of renewables, especially in the developing world. An agency along these lines should be decentralised in format to maximise local knowledge, and would provide advice on areas such as: financing options, training, best practice in implementation, technology decisions and processes for abatement accreditation under the CDM and other schemes. The intention of such an agency would be to support and join up existing energy knowledge networks rather than to supplant them: the agency's role would be primarily as a knowledge base. It should make a point of working in partnership with local communities rather than applying 'off-the-shelf' solutions not tailored to specific circumstances. Above all, such an agency will require clear and assured levels of financial commitment from developed countries.

9. Agree a target of 15 per cent of global energy needs to come from renewables by 2010

Renewable energy implementation is currently held back by the high capital costs of technologies. This leads to a vicious circle in which high capital costs restrict demand – the one factor that will bring down the costs of renewable technologies. Current policies such as the Clean Development Mechanism are unlikely to catalyse demand on the scale needed. An international framework is needed to break out of this cycle: a global target of 15 per cent of energy to come from renewable sources would help to jump-start the market.

10. Move towards tougher long-term global action on climate change

Climate change represents perhaps the most serious long-term challenge of all for people in developing countries. For this reason, deeper and more sustained action on reducing emissions at the international level is a key priority.

Conclusion

Small amounts of energy can have a big impact on the lives of poor people. The international community needs to make appropriate, affordable energy services available to the poor if it is to achieve the Millennium Development Goals. Both 'Type 1' international political commitments and 'Type 2' partnerships between government, private sector, non-governmental and community groups will be needed in order to make this happen. Only in this way can the WSSD offer strong leadership and demonstrate the political will of the international community to ensure that energy policy contributes to achieving the Millennium Development Goals.

Energy, environment and development stakeholders must work together to produce 'win-win' solutions to halve world poverty without it costing the earth. This will be perhaps the biggest challenge facing the WSSD. It could also be its biggest achievement.

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