

# Sustainable Energy - For All – For a Better Future

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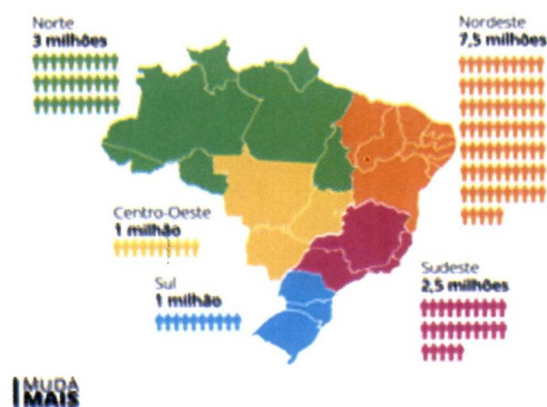
The depletion of fossil fuels and its significant environmental impacts have become the key reasons for the search of sustainable energies in the last decade. It's about effectual and sustainable contribution of energy and the effective use that meets the needs of the present generation without interrupting the needs of the future generations. One in five people in the world doesn't have access to electricity. Of those 70% are women.



In remote parts of India, people use dried cattle dung for their cooking and heating purposes. In southern California cattle dung burnt in special designed furnaces, generate heat and produce electricity. Electricity can be made from Biogas or direct burning of cattle dung and this can be practiced on large cattle herds in Africa and India. Livestock is responsible for 18% of world greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>) emission, so recycling of cattle dung will reduce the methane emission.

“Husk power system” of Bihar state in India provides power at very low price to households by running on rice husk as the fuel source. This is a good example for South and South-east Asia, because rice husks are abundant and take long time to decay naturally. Combustion of Coconut Shells and Husks can produce electricity in South and South-east Asian countries. *Gliricidia sepium* (Gliricidia) is a medium-sized tree grows in the tropical regions. It fixes nitrogen in the soil and it's used as a fodder, firewood and green manure. Combustion of dried Gliricidia sticks can produce electricity. So cultivating Gliricidia would be a sustainable solution in many ways.

## Está chegando luz para todos no Brasil inteiro



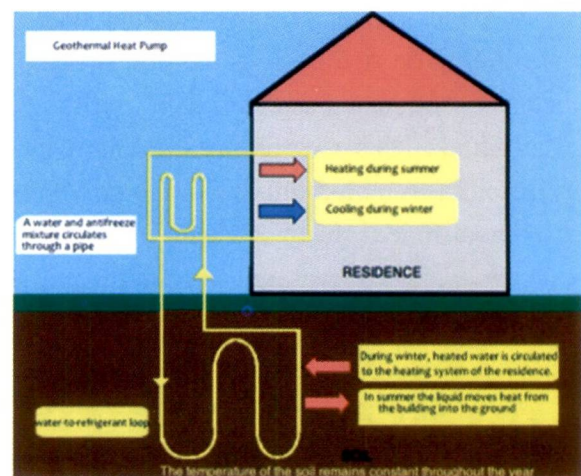
Utilization of Biofuels is now becoming popular in many countries. Vegetable oils and Animal fats are widely used in South America and Europe. Ethanol fermented from sugar canes and molasses are the major fuel source for automobiles in Brazil. *Jatropha* seeds are another good alternative biofuel. Processed *Jatropha* seeds are used to power up small machines in Brazil and India. Instead of utilizing fertile lands to grow fuel plants, local bodies should focus to grow those on barren lands. Thereby it will not affect the overall global food production.

Most European countries generate power from biogas and direct burning of their urban solid waste. The world's most effective biomass producer, Sweden generates 17% of national energy from waste. This would be a sustainable solution to sweep out urban garbage mountains in cities like Manila and Dhaka. The Brazilian program "Luz Para Todos" (Light for All) is a program providing electricity installing domestic solar and biogas power systems to people in Amazon. By today 1 million Amazon natives of Brazil are much closer to gaining access to electricity. Many natives live in deep forests and high mountains don't have an access to electricity yet so this might be a good start.

0.5 Million people all over the world use solar cookers. Sahara, Northern parts of Sub-Saharan, Middle-east, Tibet and Northern Australia have a great potential of solar power. It's a trustworthy domestic power generator than the local power grids in poor countries.

Developing countries like the Philippines and Indonesia have become the giants of geothermal power production. In Iceland, geothermal energy is used to heat buildings in winter and to cool in summer. It's an ideal energy solution for the native inhabitants in Arctic. The production of steadier electricity without fluctuations is really an advantage. Kenya and Ethiopia produce geothermal power and give a great example to other developing countries. Chili on the pacific ring of fire and Uganda, Rwanda, Burundi, Tanzania on the East African rift have high potentials of unutilized geothermal power. The main obstacle is the low power price in those developing countries even in Indonesia.

Wind is a precious power source because it's abundant and no emission of CO<sub>2</sub>. Solely or partially wind powered vehicles like Ventomobile and Greenbird would change the modern transportation to a new horizon. China targets to produce 1000 GW in 2050 from Wind power. It is a 1.5 Giga tons of CO<sub>2</sub> emission reduction which is equal to combined CO<sub>2</sub> emission of France, Germany and Italy in 2009. China also could install wind turbines in Tibet, where one of the strongest winds are flowing but haven't approved much of it in Tibet yet. Almost 20% of Denmark's electricity is produced by wind power and they aim to fully get rid of fossil fuels by 2050. Island nations like Barbados and Seashells can even utilize the strong winds, ocean wave power and solar power more. "Barbados declaration" is a good start. Also they can try on advanced technologies like Ocean Thermal Energy Conservation technology.



Somalia and Ethiopia have very high potential in wind power generation. Eastern tip of Somalia and the Ethiopian highlands are one of the best regions for strong winds. The research done by UNEP on solar and wind resources in 13 developing nations including our country Sri Lanka, has shown that our country's wind potential is 26,000 MW. The low power price is also a problem to welcome wind power to our countries. In windy parts of US especially Texas, Kansas,

North and South Dakota states, many farmers and ranchers welcome wind turbines. They receive large extra money from wind turbines and they can still use the land below turbines for growing crops or grazing cattle. Installation of wind turbines on paddy farms would motivate farmers to cultivate paddy in the dry season from pumped out groundwater and generate electricity from those in the wet season.

Sustainable energy is not all about generating energy wisely, but also about using energy wisely. For a sustainable future we should replace our out dated appliances. Shifting to CFLs could save large amount of energy. European Union, Canada and Australia have already said good bye to regular incandescent bulbs. Replacement of cathode ray TV to a new LED TV could save enormous amount of energy. Fuel efficiency improvements and keeping inflated tires would save more than 5% in overall vehicle fuel consumption.

Everyday 120,000 people in developing countries move to cities. Cities consume about 2/3 of all global energy and produce 70% of global greenhouse gas emissions. World Bank says the number of global slum dwellers now has reached 1 billion. Without taking adequate actions it will rise up to 2 billion over the next 25 years. Without making cities sustainable, “Sustainable energy for all” would be just a dream.

Vancouver in Canada, Copenhagen in Denmark and Curitiba in Brazil are cities aiming to be 100% sustainable and self-sufficient in energy production. The major transportation methods in those cities are electric vehicles and cycles. Energy efficient street lightning would save large amount of energy. The cities which have water shortages can save energy from rain water harvesting. Guntur city in India reduces 25% - 30% of its consumption using road side energy efficient bulbs. Now it is a must to replace regular bulbs and traffic lights to LEDs and CFLs and also they can be powered from solar cells.



Laptops are also another way to success the goal. IT field is now booming in South and South-east Asia. Notebook computers use only 1/3 of the electricity of the desktop PCs. “One laptop per child” should be a project to be accelerated. Apple is helping Zimbabwean children by delivering solar powered iPads. Samsung plans to launch mobile solar powered schools in Senegal and Kenya. Responsible bodies should focus to promote those kind of projects in Sri Lanka as well.

Air conditionings of some buildings take up to 90% of its total energy consumption. It is essential to make future buildings self-energy sufficient and naturally ventilated. Burj-Al-Taqa Energy Building in Dubai is aiming to be fully energy self-sufficient from solar and wind power and will be opened in the near future. It's amazing to think that this 68 storied creation with air conditioning in a desert being energized without any fossil fuels. So the sky would be the limit for the modern technology to make sustainable skyscrapers in the future.

Solar companies should invest on producing low cost solar technologies to light-up Africa and the developing Asia. To fit the affordability, they can design smaller scale solar panels. With the sake of Nanotechnology scientists should try to increase the efficiency of the cells.

Some people predict that the last drop of fossil fuels and the last chunk of coal would bring the end of the civilization's further progress. But we should not be that much negative on our future. Innovation is the foundation of survival and development. Only fearless innovation can change the world and improve lives. Even though we are living in a developing little island, I think I have brought out some innovative ideas for the success of "sustainable energy - for all – for a better future". Before it's too late, now it's the time to initiate.

