

The Renewable Energy Revolution...

For over 100 years fossil fuels such as petrol, diesel and coal have been the principal source of electricity generation globally. It is now well established that carbon dioxide emissions during the burning of these fossil fuels in the power, industrial and transportation sectors contribute to global warming by trapping heat in the atmosphere (Greenhouse Effect) causing severe climate changes. These are extreme heat waves, droughts, heavy precipitation, sea-level rise, polar melting and other dangerous long term climate impacts worldwide. Global warming is also harmful to humans and our wildlife. If we are able to reduce the fossil fuel burning drastically and limit global warming to just 1.5 °C above pre-industrial levels, we will be able to reduce all these risks and achieve sustainable development globally. Fossil fuel burning increases health risks in humans, because they emit more than just carbon dioxide. Coal-fired power plants singly emit dangerous mercury, sulphur dioxide and vast majority of soot or particulate matter into the atmosphere. Air and water pollutants emitted from coal and natural gas plants are linked to various respiratory problems, neurological disorders, heart attacks, cancer and premature death and many other serious health issues. Meanwhile, fossil fuel-powered motor vehicles are the main contributors of poisonous carbon monoxide and nitrogen oxide, which contributes to respiratory illnesses and increases the risk of death from stroke, heart disease and lung cancer.

The developed world industrialised during the past 100-150 years enjoyed enormous benefits from fossil fuels. Burning fossil fuels enabled these countries to go through an era of unprecedented development, increasing their productivity, wealth and living standards. These have over the years, contributed to global warming, atmospheric pollution and numerous health hazards mentioned above. The rest of the world now striving hard to develop and industrialize using fossil fuels confronts numerous obstacles and constraints imposed by many international organizations aimed at protecting the environment.

During the past two decades, some countries have taken steps towards rapid industrialization by harnessing renewable energy sources while minimizing the use of fossil fuels. The two most populous countries China and India are leading this Renewable Energy Revolution which is open to other developing countries as well. The most common renewable energy technologies available today cover hydro power including mini and microhydro, solar photovoltaic, solar thermal, wind, biogas, biomass, geothermal, and other emerging technologies such as wave and tidal power. Countries blessed with strong winds, sunny and clear skies, abundant plant matter, heat from the earth's interior and flowing and stored water at high altitudes are ideally suited

to harness these natural resources to generate electricity using appropriate renewable energy technologies..

Economically the use of renewables in a country at large scale will gain the ability to relieve the country from numerous economic burdens including foreign debts. Their utilization will generate employment. They guarantee the energy security economic stability of most developing countries during their anticipated fast economic growth. As the renewable energy resources don't run out, the countries could count on their availability over the long term. By following this strategy China is already emerging as a renewable energy superpower – surpassing all industrialised countries in the use of renewables. Supplying electricity to millions of people in emerging economies such as China, India and other developing countries while protecting the environment can only be met by transforming electricity generation from fossil fuel based energy resources to renewables as much as possible and as quickly as possible.

Major renewable energy technologies such as hydro, solar and wind generate electricity with no harmful air and water pollutants. Countries having sufficient renewable resources can start using these technologies for accelerating their industrial development while protecting the environment. Some of these countries can apply their manufacturing capabilities to produce and develop their own renewable energy systems, such as solar panels, solar farms and wind turbines which in turn could generate clean electricity, maintain cleaner environment, strengthen their energy security and create employment for youth while contributing to their rapid national development. Moreover, the costs of these renewable energy technologies are declining every year, and are projected to drop even more in the years to come. As China and India are using their economic strength to lead the renewable energy based industrial revolution, they are strategically triggering a global chain reaction that could fast replicate by many more developing countries.

Transformation from fossil fuels to large scale utilization of renewables will require commitment and collaboration from a broad range of stakeholders, including governments, financial institutions, power companies, non-governmental organizations, urban and rural communities, engineers, technologists and scientists. The renewable energy revolution –to transform the world increasingly powered by low cost solar and wind, combined with advanced storage alternatives such as rechargeable batteries and super capacitors – would make the realization of sustainable development vision for the entire world possible. It is a vision based on power systems that are low in carbon emissions, cheaper in cost and less harmful



towards nature and environment.

Utilization of renewable energy to generate electricity can bring environmental, social and direct and indirect economic benefits at both macro and micro levels to the entire world. It provides opportunities to expand energy access to all and move towards energy security, increase standards of living, reduce youth unemployment, improve human health and preserve nature's resources and environment. A collective action by all the countries in the world is needed in order to move away from fossil fuels and catalyze the Renewable Energy Revolution and attain the Sustainable Development Goals and the objectives of the 2015 Paris Climate Agreement.

Prof. M.A.K.Lakshman Dissanayake
National Institute of Fundamental Studies
Hanthana Road
Kandy
Sri Lanka
E-mail: lakshman.di@nifs.ac.lk
