

GLOBAL CONCERN, LOCAL SOLUTIONS

As nations develop, their need for energy will surge. To find solutions, scientists will have to leave their labs and go talk to policymakers, businesses and the public.

 by Carlos Meza-Benavides



Carlos Meza-Benavides is a professor at the Costa Rica Institute of Technology, where he coordinates the Laboratory of Electronics Systems for the Sustainability (SESLab). For 11 years, he has focused on renewable energy research and policy, with projects related to renewable energy power generation in Central America and the Caribbean. From 2012-2015, he was a senior postdoctoral researcher at the Abdus Salam International Centre for Theoretical Physics (ICTP).

In 1985, the year of the first TWAS General Meeting, an average citizen from a high-income country used seven times more energy than someone living in the developing world. In that same year, developed countries were responsible for emitting 12.7 Gt of CO₂, more than double what developing countries were emitting. Today, things have changed dramatically. While high-income countries have increased their energy consumption by 9% over the past 30 years, developing countries have doubled their use of energy. Moreover, developing countries today emit 2.2 gigatonnes [Gt] of CO₂ more than high-income countries.

Energy and economic and social development are linked together. Abundant and affordable energy will most likely accelerate economic growth. Conversely, economic growth requires more energy. Therefore, it will continue to be a major necessity for developing nations to increase their energy production. It is a global interest that new energy sources tapped by developing countries are sustainable and clean.

If we really want to make this a reality, we need to see that a successful sustainable energy system will not come solely from a



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research laboratory. We will need people from governments, industry, universities and research centres. It is advisable that scientists sometimes hang up their lab coats, go out and talk with people from government and industry so that they can fully understand the local situation and contribute to the solution.

A sustainable energy system should make use of local energy resources and take care of local energy needs. A sustainable energy system cannot be imported; it has to be designed and engineered for the conditions of the place in which it will be implemented.

Leaving aside the fact that achieving a sustainable energy system requires an efficient multidisciplinary and multi-institutional working group – which is by itself a huge task – the major technical challenges are:

- Achieving an energy carrier for transportation which is clean, non-depletable, affordable, easy to store – and, ideally, one that can be introduced swiftly into current transportation technology.
- Developing efficient and reliable decentralized power systems that can balance locally intermittent energy sources (such as solar and wind energy) with variable power consumption.
- Achieving the technology and systems to deal with the abundant – but intrinsically variable – renewable energy resources such as wind, solar and ocean energy.

The aforementioned challenges are valid everywhere, but the way they are approached may change depending on the local conditions. This creates an enormous opportunity for scientists from developing countries to develop original and innovative technology and systems that have an important and positive impact on their countries. ■