



In 2012, PlanetSolar became the first ever solar electric vehicle to circumnavigate the globe. Wikimedia photo

Sustainable Energy: A Goal in Need of Consistent Support

Dan Gagnier

After a century of dependence on fossil fuels and decades of calculating the costs of that dependence to the planet, both developed and developing economies are shifting to more sustainable sources of energy. How quickly is that transition un-folding, who's leading it and what's next? Dan Gagnier, ex-Chair of the Institute for Sustainable Development scans the horizon.

It has become fashionable in recent decades to attach the descriptor “sustainable” to almost any activity of man. Sustainability is applied to finance, economic development, forestry, mining and, most ubiquitously, energy to describe the hopes and aspirations of a broad range of humanity to solve the problems of a demographically and climatically challenged energy-hungry world.

The world is not only affected by the warming of the planet but by myriad challenges springing from human activity. This includes the exploitation and consumption of the planet's resources in

order to improve the living conditions of its inhabitants. Energy is a basic requirement for people to heat their homes, enhance their mobility, feed themselves and enjoy the benefits of light and the technological marvels of the modern world. Our challenge in today's world is how to supply energy for modern development while reducing our carbon footprint and improving our overall environment.

For many, the term “sustainable energy” applies to energy obtained from non-exhaustible resources. By definition, sustainable energy serves the needs of the present without compromising the ability of future generations to meet their needs.

There are advocates for a range of generating technologies from solar, wind, tidal, biomass, nuclear fusion and a number of biofuels derived from naturally occurring plants or marine sources. Whatever the technology, the generally accepted goal is to identify reliable means of generating enough energy to reduce our carbon footprint and to replace non-renewable resources. In particular, fossil fuels and coal are preferred targets for many. Failing some technological breakthrough on decarbonizing fossil fuels, these are likely to remain targets notwithstanding their role in meeting increasing demand globally from consumers and over a billion people without a reliable supply of affordable energy.

The question as we move through an economic and energy transition is how fast and how far are we prepared to go and at what cost? Ensuring energy for peoples' benefit while securing healthy economic development and a sound healthy environment is the challenge. Investment in innovation, clean technology and research is **now both a means and a competitive issue**.

According to the latest report from Bloomberg New Energy Finance, global investment in clean energy hit a record \$329 billion in 2015. China led the way with a 17 per cent increase over 2014 for a \$110.5 billion investment while the US was second with \$56 billion, up 8 per cent from 2014. The UK was the strongest market, with investment up 24 per cent

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to \$23.4 billion. A number of “new markets” committed tens of billions of dollars to clean energy in 2014, including Mexico (\$4.2 billion, up 114 per cent), Chile (\$3.5 billion, up 157 per cent), South Africa (\$4.5 billion, up 329 per cent) and Morocco (\$2 billion, up from almost zero in 2014).

A valid conclusion points to significant increases both in the developed and developing economies to shift towards energy generated by renewable clean sources. This in an impressive trend when, especially coupled with the billions being invested in research in areas that hold promise within the next two decades.

The context, however, holds other perspectives that are critical to successfully managing a transition to the desired outcome for low carbon economies.

According to the International Energy Agency (IEA), it is energy efficiency that is expected to play a critical role in limiting world energy demand growth to one-third by 2040, even while the global economy grows by 150 per cent in the same period. This last figure represents a challenge for us all in terms of decarbonizing energy systems and

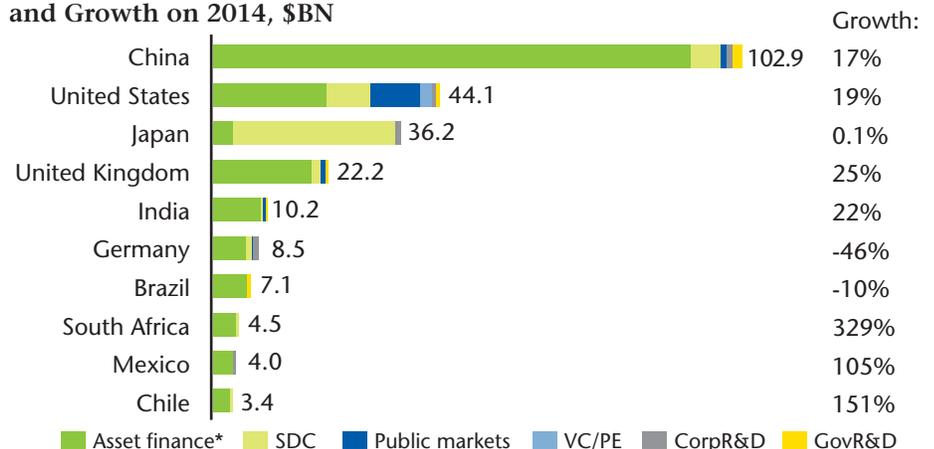
sources of all kinds.

The greatest growth in end-use during this period is expected to be electricity consumption—it is forecast to be 25 per cent of growth. Renewables-based generation reaches a share of 50 per cent in the European Union, around 30 per cent in China and Japan, and above 25 per cent in the United States and India. Coal, by contrast, accounts for less than 15 per cent of electricity supply outside of Asia.

According to statistics released by the Global Wind Energy Council (GWEC) as reported by the *Globe and Mail* in February 2016, China installed 30,500 mega-watts of new wind power last year, compared to the world total of 63,000 MW. China now has 145,100 MW of wind power, or fully one-third of the global total of 432,400 MW.

But a mixed picture overlays these facts. Fossil fuel consumption continues according to the IEA report to benefit from large subsidies. Subsidies for renewables and for biofuels also continue and will likely increase. Subsidies and investment forecasts aside, several things are clear when reading a number of reports, includ-

New Investment in Renewable Energy by Country and Asset Class, 2015, and Growth on 2014, \$BN



Top 10 countries. *Asset finance volume adjusts for re-invested equity. Includes corporate and government R&D
Source: UNEP, Bloomberg New Energy Finance

ing outcomes from the COP21 in Paris and declarations by leaders:

1. The global energy transition is underway: the question is whether the pace will increase or not.
2. Government policies and investments (including subsidies) will remain critical unless more countries institute a price on carbon.
3. Pressure on political leaders, as well as industry leaders, is only going to increase as the effects of global warming are increasingly felt.

In its special report “Energy and Climate Change” of June 2015, the IEA’s World Energy Outlook postulated that more needs to be done to restrain and diminish energy-related emissions of GHGs. These measures have mostly been on the radar screen and raised in various forums over the past ten years at the very least. They include:

1. Increasing energy efficiency in the building industry and transportation sectors.
2. Progressively reducing the use of the least-efficient coal-fired power plants.
3. Increasing investment in renewable energy technologies in the power sector from \$270 billion in 2014 to \$400 billion in 2030.
4. Phasing out of remaining fossil-fuel subsidies to end-users by 2030.
5. Reducing methane emissions in oil and gas production.

The report underscores that “a clear and credible vision of long-term decarbonization is vital to provide the right signals for investment and to allow a low-carbon, high-efficiency energy sector to be at the core of international efforts to combat climate change.”

Wherever one looks, there are signs of catalytic change taking shape. A United Nations report on sustainable energy report spells out the objectives to be reached. The first is to ensure universal access to modern energy services. The second is to double the global rate of improvement in energy efficiency. And the third is to double the share of renewable energy in the global energy mix.

The goal underpinning this agenda

is both to lower the carbon footprint on energy through a projected transition period of several decades and to invest in and pro-mote clean technology development. If you include investments in innovation and technology, clean technology and various energy efficiency programs we are talking billions uniquely from sources of public funding and government supported initiatives. Billions more from private investors and business sources provide a pool of resources that, if used well, should help us meet the state we all hope is achievable. Are we moving fast enough?

Clean Technica’s January letter estimates that investment flows of \$400 billion a year will need to triple to achieve the necessary pace of progress. A partial explanation for slow progress on sustainable energy objectives is the shortfall in investment. According to Clean Technica, global investment in areas covered by the UN’s three objectives was estimated at around \$400 billion in 2010, while requirements are in the range of \$1.0-1.2 trillion annually, requiring a tripling of current investment dollars

A UK think tank, Sandbag, registered for 2015 a record 2.5 per cent increase in renewables generation in Europe, which now makes up 29 per cent of total European electricity supply. However, as a result of lower output from hydropower and nuclear power stations, the amount of fossil fuel generation barely changed. CO₂-emissions from the power sector fell only 0.5 per cent after a 7.5 per cent fall in 2014.

Here in Canada, the recently elected Liberal government is committed to join the provinces in accelerating a price for carbon and in initiating policies to promote both sustainable energy and increased investment in clean tech as well as research and innovation.

Means of delivery have yet to be fully fleshed out but it is instructive to see federal agencies such as the Sustainable Development Technology Council (SDTC) re-formulate their priorities to help reach a more sustainable outcome. The Council’s five priority areas are:

1. Responsible natural resource development

2. Carbon-free power generation and distribution
3. Remote and Northern Community Utility Systems
4. Energy efficiency for industry and communities
5. Next generation technologies with longer-term benefits for Canada
 - Biofuels and Bio-refineries
 - Sustainable Agriculture and Food Security
 - Biodiversity Protection and Enhancement)

In his Sustainable Energy for All report of September 2011, UN Secretary General Ban Ki-moon clearly laid out the nature of the challenge for both the developing and the developed part of our planet. The developing world has several billion people without access to energy or with unreliable access while countries like Canada waste energy or fail to maximize the billions that federal, provincial and municipal governments expend on energy and energy-related programs of one form or another. The IEA’s two reports on Canadian Energy in February clearly address both the dilemmas of getting our needed energy to markets and investing in research and development to make the industry cost competitive while reducing its environmental footprint.

It’s time to decide what we can do better together. The ability to take concrete and more rapid actions towards sustainable energy depends on sharing a common vision and an ability to collaborate on making things happen. A better focus and closer collaboration between governments in this country and between the private and public sectors could go a long way to improving performance as well as enhance, even accelerate our path to a sustainable energy future. **P**

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