

THE SUSTAINABILITY OF GLOBAL ENERGY CONSUMPTION DEMAND AND SUPPLY NEEDS

Future global energy consumption demands and supply needs are unsustainable and the current rate of basic research is unable to drive the necessary breakthrough science and technologies for sustainable energy growth. While the concern over climate change has become an agitator for reducing global dependency on fossil fuels, and to promote a transition to clean energy sources, renewables continue to underperform on the open market.

Despite international calls for a global transition to clean energy sources, renewables are underperforming and underused. Commitment to renewables is low and subsidies for research and development programs are dropping. The need for a global energy transition to renewables is paramount, yet these transitions typically take anywhere between 50 and 60 years. The pace of basic research, innovation, and implementation must rapidly accelerate in order to mitigate the effects of global warming. At the same time, clean energy sources must be made economically viable for transition.

WHAT'S NEXT?

A projected global population growth of 25 per cent by 2035 will **increase the global energy demand** by 33 per cent, a massive increase that will put pressure on global energy supply. Currently, renewables power only 7 per cent of **global energy demands**, while **dependency on fossil fuels** remains at 87 per cent, down only 1 per cent in 15 years. Carbon-based energy options are not sustainable for future energy demands nor will they help to curb climate change.

With increasing energy demands and stagnating innovation, stakeholders are faced with a multitude of challenges. There is an urgent need to learn from jurisdictions which have made successful energy transitions; address issues of inequality and sustainable development in the energy of emerging economies; incentivize energy efficiency in a world of cheap fossil fuels; and push clean energy sources towards improved economic success on the open market.

IMPACTS

- **Sustainable Development and Inequality:** Both developed and developing economies need to transition to clean energy, yet this is complicated by the fact that many developing economies still have not been electrified.

- **Costs of transition:** Debate is widespread on who should bear the costs of a transition that will ultimately involve a transformation of the global economy, and mass funding for research and innovation.
- **Energy Markets:** Shifting focus to Asian energy markets, along with a reduced dependency on fossil fuels, fosters a need to reinvent the global energy market.
- **Smart Regulation:** Economic viability of clean energy technology must be increased so it can compete on the open market. Government funding, smarter regulation and effective marketing is needed.

ANALYSIS

Learning from Success

It is prudent for jurisdictions to learn from successful and failed clean energy projects and policies, or cases of localities practicing successful climate leadership. For example, Germany and California are prominent renewable energy success stories in their energy transition efforts and can serve as a model for other jurisdictions. They demonstrated that energy transition is rarely a linear process: it involves unforeseen technological changes, new challenges and developments that can complicate transition. For instance, some policies had unintended consequences and far too little attention was paid to upgrading and expanding the energy infrastructure, such as transmission lines.

The case of Alberta is another success story, and highlights the ability of regional and subnational actors to facilitate more localized transitions to clean energy. As the **largest producer of energy in Canada**, Alberta has traditionally been seen as an economy powered by fossil fuels, notably its infamous oil sands. This reality is rapidly changing, with a shift to greener sources underway, buoyed by utilizing public-private partnerships and acknowledging that energy and the environment complement rather than oppose one another. The province has developed one of the most effective energy regulatory regimes in the world; established a carbon levy in early 2017; and is aiming to dramatically reduce **pollution generated by coal-based electricity by 2030** and to use **30 per cent renewables by 2030**. The challenges of Alberta's energy transition can serve as lessons for other jurisdictions in dealing with long lifespans of fossil fuel infrastructure, working with fossil fuel providers in the transition process, and reducing social costs of energy transition in a socially responsible way that promotes – not hinders – economic development.

Sustainable Development and Emerging Economies

There is an urgent need for lifestyle-oriented design and solutions to local problems. Energy policy in Asia is taking a more central role in global discussions about energy, and the need to acknowledge developing nations as players in any equitable and lasting global energy transition is imperative. Given **Asia's demographic growth and future energy demands**, a special need for links between the developed West and developing Asia in the realm of energy transition and sustainable development is crucial. The future of energy demand places Asian markets at the forefront for global energy trade. China, in particular, should be highlighted as a leader and partner in the global clean energy transition, as well as a sponsor of renewable energy projects across Southeast Asia, Africa, and beyond.

Notwithstanding, energy links between the West and developing Asia are challenging to implement. Diverse regulatory environments amongst Asian jurisdictions present a challenge to how clean energy transition will be facilitated in various locales. The necessity for smart, localized regulation is compounded by the challenge of facilitating clean energy transition in nations that were in the process of electrifying. The potential for clean electrification raises questions about the costs associated with this shift, and how to fund this transition in developing economies in a manner that the energy gap between developed and undeveloped areas of the world is bridged.

A more nuanced discussion about sustainable development should centre on how development institutions can help facilitate clean energy transitions amongst developing nations by using a policy-

based loaning mechanism, and seed funding from fossil fuel technologies. The call for development banks to fund clean energy development stems from the lack of funding and investment from the private sector and foreign markets into the clean energy development of emerging economies. Ultimately, the arguments for energy transition must be communicated around the globe. This transition needs to accelerate in rich nations, but especially in emerging economies, which will constitute the bulk of future global energy demand and Green House Gas (GHG) emissions.

Incentivizing Efficiency and Economic Growth

Another major challenge is the lack of economic viability for various sectors of clean energy. Sectoral growth on the open market can be curbed by subsidies, e.g. as witnessed by the case of solar energy. To make clean energy economically viable in the long term, it has to involve multi-sectoral components and strong technology development. Moreover, there is a need to incentivize energy efficiency and make future economic growth carbon-neutral across sectors. Smart government regulation, effective marketing/communication, and additional funding for research and development programs in carbon-neutral energy initiatives from governments and international bodies are possible solutions.