

## Navigating the Future

 25 May 2017

### Low-carbon energy infrastructure in Southeast Asia-



Southeast Asian countries face a set of interconnected yet fundamental energy transition dilemmas. The region's rapidly industrialising economies, intensifying levels of urbanisation and the increasing prosperity of the middle class have created unprecedented demand for energy and electricity services.

The average energy use per capita in the 10 Southeast Asian countries remains quite low – about 0.61 metric tonnes of oil equivalent (mtoe) per person, compared to 1.1 mtoe for China, 4.67 mtoe for Japan and 1.69 mtoe for the world. However, the use of commercial energy has increased substantially in the last 25 years. The region is

endowed with about 8 per cent of the fossil fuel resources in the world. For example, nearly all of the coal reserves are located in Indonesia, 83 per cent, and Vietnam, 10 per cent; natural gas and oil are found in Brunei, Indonesia, Malaysia and Vietnam. Indonesia and the Philippines possess substantial reserves of geothermal energy, and are the second and fourth largest producers respectively of energy from geothermal resources.

Hydropower is abundant in Thailand, Indonesia and Vietnam. All the countries are endowed with biomass, a common, non-commercial energy source for cooking and energy, particularly in the rural areas. The diversity of available energy resources provides opportunity for cooperation.

#### Managing the multiple challenges in meeting future energy demand


Southeast Asian countries face challenges in developing and distributing energy resources, from their remote locations to those urban centres of production and consumption where they are needed most. Moreover, the economic and energy geography of Southeast Asian countries is highly uneven. The challenge of energy resource development, distribution and energy poverty in this region is rivalled by the difficulties associated with improving energy security and reducing carbon emissions. As of 2015, this region has at least 134 million people, or 22 per cent of the population without access to modern electricity. It is home to thousands of low-lying islands comprising major portions of Indonesia and the Philippines that are extremely disadvantaged in terms of energy access. Following the Paris Agreement in December 2015, and the ratification of intended nationally determined contributions (INDCs) in November, the countries in this region are paying more attention to advancing viable and scalable low-carbon energy transformation options.

In a business-as-usual scenario, energy supply in these countries is projected to increase steadily from 619 mtoe in 2013 to 1,685 mtoe in 2040, growing at an annual rate of 4.7 per cent. This projected growth is higher than the trends observed between 1990 and 2013, when supply growth averaged 4.2 per cent per year. Carbon emissions during the period are expected to grow at the rate of 4 per cent per year. The difference between total energy use in the advancing-policy scenario and the business-as-usual scenario shows approximately the potential for clean energy development and energy saving that could be achieved by these countries through the implementation of advanced policies on efficiency in the electricity power production and consumption, transport, residential and industry sectors. These policies are expected to contribute to a reduction in energy demand of 13 per cent by the end of 2030, and thus to a reduction in carbon emissions of the same or larger magnitude.

#### Managing risks in low-carbon energy investments

## Energy




**Expansion Plans**  
 May 25, 2017



**Striving for Sustainability**  
 May 25, 2017




**Navigating the Future**  
 May 25, 2017



**Key Statistics**  
 May 25, 2017



**Synergies on Cards**  
 Mar 27, 2017



**Harnessing Hydropower**  
 Mar 27, 2017



**Energy Infrastructure**  
 Mar 27, 2017



**Risky Proposition**  
 Mar 27, 2017



**Key Statistics**  
 Mar 27, 2017



**Leading the Way**  
 Jan 20, 2017

## Financing vehicles for pooling private investments in low-carbon energy infrastructure

Category	Special purpose vehicles	Green bonds	Pooled vehicles
Description	Leasing scheme using debt facilities	Fixed income debt securities	Green infrastructure funds, private equity funds, and other listed vehicles
Actors	Provided by corporate banks or institutional investors or utilities	Issued by governments, international financial institutions or corporate banks	Issued by asset managers, investment banks or special private funds
Advantage	Equipment can be leased to end-user to reduce the impact on cash flow, while giving access to large-scale debt finance	High degree of security when backed by governments	Exposure to companies or assets for small investors
Typical application	Energy efficiency improvement or microgrid	All mature clean technologies such as wind and solar	All mature technologies, predominantly large scale solar and wind power

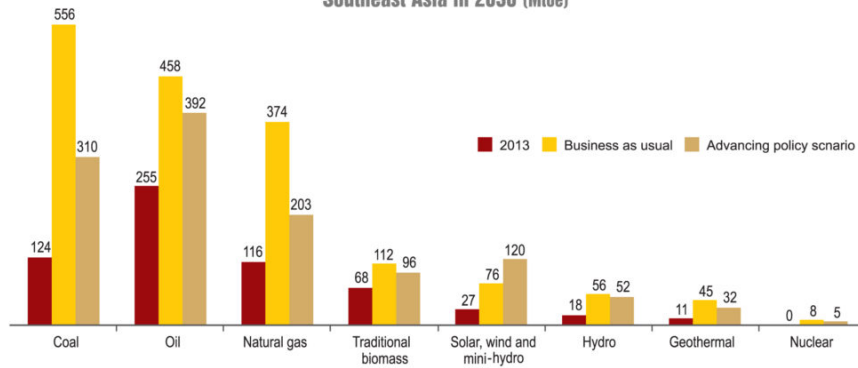
It is estimated that the overall low-carbon energy supply infrastructure investments to meet the INDC targets will rise steadily, and cumulatively, \$2,100 billion is needed by the year 2030 for the Southeast Asian countries. About 46 per cent of this requirement will be in the power sector, followed by energy efficiency at about 17 per cent. There is demand for low-carbon investment finance for many types of projects with diverse needs. Each investment has its own distinctive risk profile, in which different factors – market, technical, regulatory – have different degrees of prominence. From an infrastructure financing perspective, there is the overreaching concern that the cash flows on low carbon investments during a project's lifetime may be insufficient to pay back the amounts invested in real terms and earn a reasonable return because of regulatory, market and financial barriers. Regulatory barriers include misalignment of energy policies with climate and social development policies. Subsidies remain as market barriers that have implications on energy prices and cost advantages of low-carbon energy production and consumption. Abrupt fluctuations in exchange rates and rise in interest rates constitute financial risks related to new investments. Similarly, investors have different time horizons and tolerance for risk. There are no easy solutions to tackle these risks. A learning process is needed between policymakers and the finance industry to derisk the investments. Policymakers in the region need to understand the types of risks and the regulatory and incentive mechanisms necessary to attract investments. The financial community needs to appreciate the distinctive nature of low carbon investments from the sustainable development perspective and to develop suitable vehicles to finance low-carbon energy infrastructure projects in a way that aligns with varying sizes, operational models and investment objectives. Intermediaries, such as international financial institutions and private corporate banks, can offer effective financial products as exemplified in the table.

### Role of governments

What could help unlock this source of private finance for the low-carbon energy transition? Research undertaken by the Economic Research Institute for ASEAN and East Asia recommends a number of steps that governments can take towards accelerating low-carbon infrastructure projects.

- Ensure a stable integrated-energy, economy and environmental policy environment that provides investors with long-term predictability and clear incentives
- Provide a regional- as well as national-level, low-carbon infrastructure roadmap, which would raise private sector confidence in commitments
- Address market failures, such as pervasive subsidies and lack of carbon pricing, which will result in increased investments in low-carbon energy infrastructure
- Issue innovative financial products such as special purpose vehicles, green bonds, etc., that support the development of new markets with appropriate risk-sharing mechanisms
- Promote market transparency, credit rating systems and data on energy infrastructure investment by supporting regular public-private dialogue

### Comparison of future energy supply scenarios in Southeast Asia in 2030 (Mtoe)



Public funds play a crucial role in stimulating private investment on the scale necessary to ensure affordable and sustainable energy infrastructure development. Direct investment in renewable and energy efficiency projects is only one aspect of government involvement; other forms such as partial credit guarantees, in cooperation with international financial institutions such as the Asian Development Bank are likely to play a more important role in navigating the stormy energy future of Southeast Asia.

Venkatachalam Anbumozhi is a Senior Economist at the Economic Research Institute for ASEAN and East Asia, Indonesia. His previous positions include capacity building specialist and senior fellow at the Asian Development Bank Institute and Assistant Professor at the University of Tokyo, where he taught courses on International Co-operation and Development Finance. He has published several books, authored numerous research articles and produced many project reports on cross-border infrastructure design, sustainable energy and resource management policies, and private sector participation in green growth. Anbumozhi was a member of the APEC Expert Panel on Green Finance and the ASEAN Panel for promoting climate-resilient growth. He has speaking engagements at some of the leading international organisations and is a prolific writer on current affairs in the major dailies of Asia. He obtained his PhD from the University of Tokyo.



**Venkatachalam Anbumozhi**, Senior Energy Economist, Economic Research Institute for ASEAN and East Asia

[eMagazine](#)

[Contact Us](#)

[Advertise](#)

#### Categories

Categories