SUSTAINABLE ENERGY FOR ALL

TRACKING PROGRESS IN ASIA AND THE PACIFIC: A SUMMARY REPORT

ASIAN DEVELOPMENT BANK

ADB

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2015

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Foreword

The global Sustainable Energy for All (SE4All) initiative seeks to achieve, by 2030, universal access to electricity and safe household fuels, a doubled rate of improvement of energy efficiency, and a doubled share of renewable energy in the global energy mix.

These targets are fully compatible with the priorities and policies of the Asian Development Bank (ADB) which were set down as part of our institutional strategy to combat poverty in Asia and the Pacific region. Energy has a central role in ending poverty, and powering human development, and in order to shape a sustainable and equitable future, decisions must be made on the direction of energy development today.

As the multilateral development bank serving the Asia and the Pacific region, ADB recognizes that the countries of developing Asia and the Pacific are faced with major challenges in terms of providing energy sustainably, while also providing it affordably. Branching out of these two main challenges are a vast number of interrelated issues which cut across borders, including concerns on energy security among rising fuel imports, the need for the energy sector to respond to climate change and its effects on infrastructure, and solving the paradox of an Asia which is on track to become the world's leading consumer of energy, yet is also currently home to a majority of the world's energy poor.

SE4All has provided a way to rally efforts to meet these challenges. Under its banner, ADB, in partnership with the United Nations Development Programme (UNDP), and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) have taken leading roles in SE4All's Asia-Pacific Regional Hub (AP-SE4All). This hub guides and advises partner countries in the Asia and Pacific region and coordinates with them to program national actions and priority activities that will contribute to achievement of SE4All's goal of sustainable energy for all by 2030. In this way, the Hub creates a unified response out of the many, varied programs and initiatives working separately on sustainable energy and energy access in the region.

Alongside Sustainable Development Goal 7, which for the first time, sets a global target for energy development, SE4All can help guide development along a smarter path of energy use.

This report reviews the early work of the AP-SE4All, and the conditions of the developing Asia and Pacific countries it is working with. It charts preliminary progress, and assesses the policy environment which the work to achieve the SE4All targets will operate within. Uniquely, this report highlights the nexus of issues involving women, children, and their shared health, which can be measured to gauge household living conditions, and showcases the often overlooked, but highly effective role women have in making participatory decisions about energy, and acting as change agents. Overall, this report relates

the specific qualities, challenges and opportunities in Asia and the Pacific to the global, or overall, situation which was analyzed in SE4All's guiding "Global Tracking Framework" document, and puts into context how meeting the 2030 objectives in Asia will greatly contribute to meeting them worldwide.

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This publication is a joint effort of the team led by Jiwan Acharya, Senior Climate Change Specialist (Clean Energy), ADB. The team of authors includes Marianne Joy Vital, Ana Maria Tolentino, and Suman Basnet. Soma Dutta (ENERGIA) contributed as the primary author of the nexus chapter, and Kimberly Roseberry (ESCAP) compiled the policy matrix and wrote the section on policy interventions of partner countries. Hongpeng Liu (ESCAP) and Manoj Kumar Khadka (UNDP) provided guidance and support in the preparation of this report.

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Abbreviations

ADB	Asian Development Bank
AP-SE4All	Asia-Pacific Sustainable Energy for All Regional Hub
DFI	development finance institution
DMC	developing member country
ENERGIA	International Network on Gender and Sustainable Energy
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
ESCO	energy service company
ESMAP	Energy Sector Management Assistance Program
FAO	Food and Agriculture Organization of the United Nations
GDP	gross domestic product
GEF	Global Environment Facility
GERES	Group for the Environment, Renewable Energy and Solidarity
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GTF	Global Tracking Framework
HIO	high-impact opportunity
IEA	International Energy Agency
IEC	Integrated Energy Centre
IIASA	International Institute for Applied Systems Analysis
IRENA	International Renewable Energy Agency
Lao PDR	Lao People's Democratic Republic

LMDI	Logarithmic Mean Divisia Index
LPG	liquefied petroleum gas
MDG	Millennium Development Goal
NKS	Neang Kongrey Stove
OECD	Organisation for Economic Co-operation and Development
P2P	Power to the Poor (P2P) program
PDF	Project Development Facility
PRC	People's Republic of China
SDG	Sustainable Development Goal
SE4All	Sustainable Energy for All
SEAS	Sustainable Energy Association of Singapore
SECOE	Sustainable Energy Center of Excellence
SURE	Sakhi Unique Rural Enterprise
TFEC	total final energy consumption
TPES	total primary energy supply
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
WHO	World Health Organization

Key Findings

The Sustainable Energy for All (SE4All) initiative was launched in 2011 by the United Nations (UN) Secretary General to achieve three interlinked targets by 2030: (i) universal access to modern energy services; (ii) a twofold increase in the global rate of improvement in energy efficiency; and (iii) a doubling of the share of renewable energy in the global energy mix.

Global efforts toward the SE4All objectives must be tracked to determine progress, the gaps that remain, and the actions needed to close the gaps and achieve the targets. The Global Tracking Framework (GTF), a consensus-based tracking system developed by partners in the SE4All initiative, is a huge step in this regard. The World Bank and its Energy Sector Management Assistance Program (ESMAP), and the International Energy Agency (IEA) lead this work, supported by 20 other organizations.

A consistent and comprehensive database built under the GTF tracks the achievement of the SE4All targets and enables the Asia-Pacific regional hub (AP-SE4All) to monitor the performance of the countries in the region, particularly the developing group. This first report of the AP-SE4All to track progress in the region focusing on the energy–women–children–health nexus, follows on from the UN General Assembly's declaration of 2014–2024 as the Decade of Sustainable Energy for All, with the first 2 years dedicated to raising awareness about energy, women, children and health. In geographic scope, this report pays particular attention to the developing members of the Asian Development Bank (ADB). The following are the key findings of the report, based on a review and analysis of currently available data and literature, and consultations with stakeholders.

Progress Toward the SE4All Targets

- There has been progress toward universal energy access, although access deficit continues to be a concern. In 2012, all members increased their electrification rates and 16 economies reached 100% electrification, but about 426 million people had no access to electricity. As for modern cooking and heating solutions, in 2012, only four economies relied fully on nonsolid fuels. Despite progress in most economies, an estimated 2 billion still depended on solid fuels, which could cause serious health problems from indoor air pollution.
- High-impact countries in Asia and the Pacific—those that contribute significantly to energy demand in the region and the world—have become more energy efficient and have produced energy savings. Overall, energy intensity declined by 2.4% between 1990 and 2010. The target is to accelerate the decline by 4.8% per year, on average, from 2010 to 2030.

- The aggregate share of renewable energy in final energy demand for the Asia and the Pacific stood at 24% in 2012, about the same as in 2010 but lower than the 36% estimate in 1990. A 48% share is targeted for 2030. The significant reliance on traditional biomass—17% of total final energy consumption in 2012—is considered unsustainable. On the other hand, that share has been decreasing since 1990, relative to other renewable energy sources, implying that economies have been making progress toward using energy from more modern and cleaner sources. In particular, there has been an exponential increase recently in the contribution of solar and wind energy to electricity generation. This is a welcome development that inspires optimism about the performance of the region in the coming years.

The Energy–Women–Children–Health Nexus

Recognizing the links between energy and women's and children's health and general well-being, the report has found good practices in the region from which stakeholders can learn.

- Case studies in the region have shown how modern energy, through market-driven sustainable solutions, can transform women and children's lives, and contribute to overall development.
- A good number of enterprises in the region have mainstreamed gender effectively into their business models, providing a strong case for women as actors of change.
- Government policies that support gender mainstreaming could push the SE4All agenda forward. Policies and regulatory frameworks are decisive factors in bringing women in greater numbers into the planning, financing, implementation, and monitoring of energy projects, especially those that are privately led.

SE4All Partnership in Asia and the Pacific

- Twenty developing member country (DMC) governments have already opted to join the SE4All Partnership, and are committed to implementing country actions to achieve the SE4All targets under the country action process. Bangladesh and Nepal are about to complete all four steps in the process.
- Outside the country action process, Bhutan, the PRC, Malaysia, Mongolia, and the Philippines are participating in the Global Energy Efficiency Accelerator Platform, which promotes public–private partnerships in energy efficiency.
- Creating an enabling environment through policy actions is the most direct way for governments to realize their commitment to the SE4All Partnership. The Asia and the Pacific DMCs surveyed have shown significant progress in the last 5 years in putting in place policy measures and programs aimed at increasing energy access, energy efficiency, and renewable energy use. They have set targets in each of these areas, and they continue to introduce and expand plans and measures for achieving the targets. The policy interventions are most comprehensive in the PRC and India, making these countries prime examples of translating commitments into policy intervention designed to promote action.

The Way Forward

Interest in the SE4All Partnership is mounting in the international community, especially amid the intensified activity spurred by the next development agenda. The Sustainable Development Goals (SDGs) provide specific focus on sustainable energy through SDG7, which is based on the three targets of SE4All. Monitoring progress in achieving the SE4All objectives will therefore provide the foundation for tracking global progress in meeting SDG7.

The GTF, though still a work in progress, has made some headway in monitoring and, in its 2015 report, has laid down courses of action that will improve data and data collection. Monitoring by the AP-SE4All of the countries in its region—using information from the GTF, other data sources, and input from stakeholders—will contribute to this effort.

The following recommendations have been made to address the identified gaps and challenges in monitoring the region's progress and advancing the SE4All targets[1]:

- **Strengthen regional collaboration.** Multi-stakeholder engagement within the region is needed for consensus-based monitoring. Input from stakeholders—governments, the private sector, and civil society—will also help in data collection and improve analysis. Consultations must be consistently done through a regional platform.
- **Encourage government buy-in.** Input from governments will increase the accuracy of data and analysis, and greater ownership and accountability will give governments a strong incentive to push the SE4All agenda. A network of focal government agencies, to facilitate collaboration among partner countries, was also suggested during the consultation workshop.
- **Develop monitoring capacity.** Government statistical agencies must use methods aligned with those of the GTF. Training should also be provided to civil society and the private sector, which must be involved in country-level monitoring to improve transparency and accountability.
- **Expand the knowledge database.** Country-specific experiences, particularly emerging good practices, should be documented to broaden understanding of the issues and gaps, and offer insights into how practical information can be better captured to strengthen monitoring. This information sharing will also promote continuous learning among countries.
- **Build a database of policy interventions.** Aside from pure numbers, qualitative information about policies and government initiatives in the region will help policy makers make the right decisions based on effective solutions adopted in other countries.

[1] These suggestions were raised by stakeholders during the SE4All consultation workshop in June 2015.

1 Background and Introduction

With the Millennium Development Goals (MDGs) set to expire in 2015, discussions in the international community have turned to the post-2015 development agenda. The Sustainable Development Goals (SDGs) will build on the gains made in meeting the MDG targets and continue to address the remaining gaps and challenges. These goals supersede the MDGs while expanding their coverage to other sectors such as energy. In particular, the proposed SDG7 affirms the need to "ensure access to affordable, reliable, sustainable and modern energy for all."

Empirical evidence shows a clear correlation between energy access and development (IIASA 2012). Energy access supports economic activities and human capital development, opens up productive opportunities, and is conducive to social well-being. But energy use can also have adverse effects. Pollution from fossil-based and biomass-based energy causes climate and health risks. The cutting of trees and excessive foraging of forest materials for fuel degrade the environment. And rapid development and population growth are pushing up demand for energy amid resource scarcity and climate change. Attention must be given to making energy systems clean, sustainable, and more efficient to support equitable growth and development not only in this generation but also in the next.

These considerations have already drawn the attention of the international community. The year 2012 was declared the International Year of Sustainable Energy for All by the UN General Assembly, and the Sustainable Energy for All (SE4All) initiative was launched by the UN Secretary-General Ban Ki-moon in 2011 as one of his signature key initiatives to bring together stakeholders to achieve three interlinked targets to facilitate the transition to sustainable energy systems. To publicize energy issues and promote sustainable development particularly after the MDGs expire in 2015, the UN General Assembly also proclaimed 2014–2024 the Decade of Sustainable Energy for All.

The Sustainable Energy for All Initiative

The SE4All initiative was launched in 2011 by the UN Secretary General with the goal of achieving Sustainable Energy for All by 2030 through the following interlinked targets: (i) universal access to modern energy services; (ii) a doubling of the global rate of improvement in energy efficiency; and (iii) a doubling of the share of renewable energy in the global energy mix. These targets are firmly believed to be achievable only through the combined efforts of government, business, and civil society.

These three objectives, each one important in its own right, are mutually reinforcing. Renewable energy technologies can bring affordable modern energy services to rural communities, where extending the conventional power grid would be prohibitively expensive and impractical. Improvements in energy efficiency can produce substantial cost savings for governments, businesses, and households,

while freeing up power for other, more productive, uses. Achieving all three objectives will maximize development benefits and help mitigate climate change over the long run.

By catalyzing major new investment opportunities, the SE4All initiative will help remake the world's energy systems, reduce energy poverty, and increase prosperity.

To sustain the vision of the SE4All initiative, the objectives were disaggregated into 11 action areas to provide a framework for identifying high-impact opportunities, a way to organize multi-stakeholder actions, and a tangible entry point for stakeholders (Figure 1). These action areas were further grouped into two categories: seven sectoral and four enabling action areas (Table 1.1). Sectoral action areas address electricity and modern cooking solutions, power generation and transmission, industry and agriculture, transport, and buildings. The enabling action areas incorporate crosscutting mechanisms designed to support effective sectoral action, address existing obstacles, and catalyze rapid scale-up. Each action area includes a range of high-impact opportunities (HIOs) for change. As defined and implemented by SE4All partners representing businesses, nongovernment organizations, foundations, the academe, and entrepreneurs, these are actions areas likely to show significant potential to advance the three SE4All targets.

In this respect, as the UN has dedicated 2014 and 2015 to raising awareness of the benefits of modern energy services to women and children, particularly their health, and as this summary report revolves around the energy–women–children–health nexus, it is worth noting that the SE4All HIO in energy and women's health[2] has already been put into operation with the aim of increasing access to, and the effective and sustained use of, energy-dependent health services, particularly among women in low- and middle-income countries. This HIO also emphasizes the role of women as agents of change in the sustainable energy sector. The multidisciplinary effort is led jointly by the UN Foundation in

Figure 1: The SE4All Global Action Agenda

Source: SE4All (2014).

[2] http://www.se4all.org/hio/energy-and-womens-health/

partnership with UN Women, and the World Health Organization (WHO), bringing together partners from the energy and health sectors in government, business, and civil society.

Table 1.1: SE4All Action Areas

Sectoral Action Areas	Enabling Action Areas
Modern cooking appliances and fuels	Energy planning and policies
Distributed electricity solutions	Business model and technology innovation
Grid infrastructure and supply efficiency	Finance and risk management
Large-scale renewable power	Capacity building and knowledge sharing
Industrial and agricultural processes	
Transportation	
Buildings and appliances	

Source: SE4All (2014).

Monitoring Global Progress through the Global Tracking Framework

Global progress toward the SE4All targets must be tracked to determine where the initiative stands, how various actions are contributing to the attainment of the three targets, how much remains to be done, and what actions are needed to achieve sustainable energy for all. The Global Tracking Framework (GTF) was therefore developed under the leadership of the World Bank Group and its Energy Sector Management Assistance Program (ESMAP), and the International Energy Agency (IEA), supported by 20 other organizations.

Energy baseline data pertinent to the SE4All targets were established as a first step under the GTF, to enable biannual updates on trends in energy access, renewable energy use, and energy efficiency. This data platform draws on national data records for more than 180 countries, which together account for more than 95% of the global population. Two GTF reports have already been released. The first report (World Bank and IEA 2014) laid out the methodology for tracking progress and established the baseline information for 1990–2010. The latest report (World Bank/ESMAP and IEA 2015b) identified the improvements in data collection methods and capacity building needed for more nuanced and accurate reporting, and gave an account of global progress made toward the SE4All goal in 2010–2012.

The Regional Hub

Six thematic hubs and four regional hubs are part of the SE4All Global Network. Four regional hubs in Africa, Europe-Central Asia-Mediterranean, Asia and the Pacific, and Latin America/Carribean, were established to facilitate and coordinate implementation at the regional level. The Asia-Pacific SE4All regional hub (AP-SE4All), officially launched in June 2014, is led by the Asian Development Bank (ADB), the UN Economic and Social Commission for Asia and the Pacific (ESCAP), and the United Nations Development Programme (UNDP). Its mission is to accelerate and facilitate the achievement of the SE4All objectives in the Asia and the Pacific region by

- leveraging the existing structures of ADB, UNDP, and ESCAP energy programs and integrating the strengths of all three development partners;

- harnessing the three development partners' convening power, country presence, and networks to mobilize partnerships to catalyze concrete actions at the country level; and
- facilitating and coordinating core activities with respect to the SE4All objectives, in close cooperation with the SE4All's Global Facilitation Team.

Various activities have been carried out under the AP-SE4All, as discussed below.

Regional hub secretariat established. A full-fledged secretariat has been set up at ADB headquarters in Manila, with ESCAP and UNDP support.

Support provided for country actions. One objective of the hub is to provide support to country action agendas. The process formulized in the SE4All Country Action Reference Document follows the sequence: Declaration of Partnership, Rapid Assessment/Gap Analysis, Country Action Agenda, and Investment Prospectus.

SE4All investor forums held. The first such forum was organized by ADB's Energy for All Initiative during the Asia Clean Energy Forum in Manila in June 2014. This was followed by the first country-focused SE4All Investor Forum, which was held in Bangladesh in October 2014 and was organized by ADB in partnership with the World Bank, the US Department of State, and the Government of Germany. Country-focused investor forums will also be held in Nepal (2015) and Indonesia (2016).

The second SE4All Investor Forum during the 10th Asia Clean Energy Forum in Manila in June 2015 shared the results of AP-SE4All initiatives with energy access enterprises, investors, and governments. Clean-energy practitioners were encouraged to take part in the discussions on ways of catalyzing investments in renewable energy, energy efficiency, and energy access.

Second SE4All Forum (May 2015, New York). Two sessions centered on the activities of the regional hub and the project development facility.

- "What's Happening in Asia and the Pacific" highlighted the status of AP-SE4All initiatives and the challenges faced by countries in implementing the SE4All objectives in the region.
- "Project Development Facility: Why We Need It" explained why SE4All should replicate the Energy for All project development facility in its future investment efforts, not just in energy access but in renewable energy and energy efficiency as well.

New partnerships formed. ADB has signed an agreement with the Sustainable Energy Association of Singapore (SEAS) for the creation of a Sustainable Energy Center of Excellence (SECOE) for the region, and for SEAS assistance to ADB in sustainable energy policy, technology, and financing. The SECOE was officially launched in Singapore in March 2015. Its first activity was the Asian Regional Workshop on Roadmaps for Energy Efficiency on 27–31 July in Singapore.

During the 9th Asia Clean Energy Forum in June 2014, ADB also signed a memorandum of understanding with the International Renewable Energy Agency (IRENA) committing the two organizations to creating and strengthening partnerships, policies, programs, and investments that will support the rollout of cost-effective renewables to off-grid rural communities in Asia and the Pacific region. IRENA was named the SE4All Renewable Energy Hub in 2013.

Efforts made to strengthen communications and knowledge management. The AP-SE4All is looking to expand its partnerships and consolidate efforts to promote the Sustainable Energy for All initiative in Asia and the Pacific through workshops and other communication, education, and awareness-raising activities. Facebook (Sustainable Energy for All–Asia Pacific) and Twitter (@SE4All_AsiaPac) accounts have already been set up for the hub and a web link will be created soon.

Partnership database instituted. A database of SE4All partners has been constructed and is continuously being expanded as new partners in the region join the effort to reach the SE4All objectives.

Discussions initiated with SE4All Global Energy Efficiency Accelerator Platform. ADB is looking into deepening its engagement on energy efficiency within the framework of the SE4All Global Energy Efficiency Accelerator Platform. Six government entities in Asia and the Pacific (Ulan Bator in Mongolia; Metro Manila and the city of Muñoz (Nueva Ecija) in the Philippines; the Iskandar Regional Development Authority in Malaysia; Thimphu in Bhutan; and Jinan, the capital of Shandong province in the PRC) have so far shown interest in collaboration.

Asia and the Pacific progress toward SE4All objectives monitored. In line with its mission, the AP-SE4All is monitoring the progress made toward the SE4All objectives by countries in the region. Country and overall regional performance will be benchmarked against global progress. A status report will be released every 2 years, with each edition having a specified theme.

A consultation workshop on monitoring in Manila in June 2015 substantiated research and data analysis, and documented practices, projects, and synergistic initiatives contributing to the achievement of the SE4All objectives and relevant to the energy–women–children–health nexus.

Rationale of the Report

Global progress toward the SE4All objectives must be tracked to determine the contribution of various efforts to that progress, and to identify the remaining gaps and the actions needed to fill the gaps. The GTF, a consensus-based tracking system, was developed by partners in the SE4All initiative for this purpose. The efforts made under the GTF to build a database that provides a consistent and comprehensive record of the achievement of the SE4All objectives have given the AP-SE4All a good starting point for monitoring the performance of the Asia and the Pacific countries, particularly the developing group. This first report of the AP-SE4All has for its theme the energy–women–children–health nexus. It follows on the UN General Assembly's declaration of 2014–2024 as the Decade of Sustainable Energy for All, with the first 2 years devoted to raising awareness of the benefits of modern energy services to women and children, particularly their health, and of the role of women as agents of change for sustainable energy.

The AP-SE4All will monitor regional progress toward the SE4All objectives every 2 years and each report will have a particular theme. Apart from looking into the key indicators developed under the GTF, the biannual update will report practices, projects, and synergistic initiatives that are conducive to the attainment of the objectives. It will also present more practical information based on consultations with stakeholders, partners, and experts. The AP-SE4All will thus endeavor to capture the full range of the region's SE4All experience, with the help of the GTF.

Methodology

This report follows through the efforts made under the SE4All GTF to build a consistent and comprehensive database for tracking country and regional progress toward the SE4All objectives. It therefore relies primarily on the 2015 GTF report for the headline indicators and the corresponding country data. In this report, however, the data were confined to computed growth rates and derived shares; disallowing aggregation of some data to the regional level limited the analyses.

The present report addresses these challenges by using data from the International Energy Agency (IEA), the UN Population Division, the World Bank World Development Indicators (WDI), ESCAP, and official country statistics to derive the needed estimates. These sources were also used to produce additional indicators, which are the report's proposed value addition to the literature. As much as possible, data from the same source or database were used to ensure comparability and consistency. However, where irregularities in country-level information were observed on cross-checking, the figures were replaced with computations using data on IEA energy balances for countries outside the Organisation for Economic Co-operation and Development (OECD) area, or WDI and country statistics if the IEA database did not include such data. Some countries without relevant data were excluded from regional aggregations. All charts and tables on the estimates presented here have notes to explain the data, the method of estimation, and the data sources.

For the energy–women–children–health nexus section, data from the WHO's Global Health Observatory were used to provide empirical evidence of the burden of indoor air pollution, and to determine the contribution of developing Asia and the Pacific to world estimates. Other publications and articles from partner agencies supplemented the empirical evidence. In the selection of the case studies, geographic distribution, service delivery models, and thematic relevance were taken into account. The relevance of these projects and initiatives to the SE4All targets and the energy–women–children–health nexus was the primary criterion.

This report also attempted to map the policy environments of the Asia and the Pacific developing countries that opted into the SE4All Partnership. With the help of ESCAP, a matrix of relevant policy features that could help promote the achievement of the SE4All objectives in the region was developed using information from official government documents, the SE4All country rapid assessment and gap analyses, the Renewable Energy Policy Network for the 21st Century (REN21), the World Bank's Readiness for Investment in Sustainable Energy (RISE) project, and the ESCAP Asia Pacific Energy portal[3].

The data used in this report and their sources are summarized in Table 1.2.

Other data and information from journals, articles, and other reference books were used to deepen the analysis. The report also benefited from the input of different stakeholders, particularly governments, experts, and practitioners that attended the consultation workshop on 14 June 2015.

[3] The ESCAP Asia Pacific Energy portal is a database on energy-related data and policy information for ESCAP member and associate member States. It offers tools, including highly interactive data visualizations, which enable identification of trends, and policy tracking. The website is http://www.asiapacificenergy.org/

Table 1.2: Data and Data Sources Used in This Report

Data Source	Country-Level Data	Notes
2015 GTF report: data annex	• Percentage of population with access to electricity (national, urban, rural), 2012 • Percentage of population with access to nonsolid fuels (national, urban, rural), 2012 • Primary energy intensity (growth rates), 1990–2010, 2000–2010, 2010–2012 • Energy intensity using decomposition method of analysis (growth rates), 1990–2010, 2010–2012 • Cumulative avoided energy consumption, 1991–2010, 2010–2012 • Share of renewable energy consumption, by technology, 2012 • Share of renewable energy in electricity generation, 2012 • Total final energy consumption, 2012	The data annex of the 2015 GTF report shows only the computed figures and not the underlying data, except for the following: total final energy consumption in 2012; primary energy intensity for the years 1990, 2010, 2012; and cumulative avoided energy consumption. The authors of the present report used other sources of data to properly aggregate estimates to the regional level.
GTF database, online	• Renewable energy consumption, by technology, 1990, 2000, 2010 • Total final energy consumption, 1990, 2000, 2010	This database reports time-series data, although only from 1990 to 2010. However, there are deviations from the 2015 GTF report, particularly in the derivation of energy efficiency indicators. Therefore, only the information on the renewable energy consumption of ADB developing members was used in this report.
IEA, Energy Balances of Non-OECD Countries, 2014	• Residential consumption of electricity, 2012 • Total primary energy supply, 2012 • Total final energy consumption, 2012 • Generated electricity, by source, 2012	IEA data were used to derive additional indicators (this report's value addition) and to cross-check information reported under the GTF, particularly for the indicator "share of renewable energy in electricity generation."
ESCAP Statistical Yearbook for Asia and the Pacific 2014	• Solid biofuels production, 2012 • Total primary energy supply, 2012	ESCAP data were used to derive an additional indicator, also the value addition of this report.
World Development Indicators, online	Share of renewable energy in electricity generation, 2011	This source was used to cross-check information reported under the GTF, particularly for the indicator "share of renewable energy in electricity generation," for countries without IEA data. Latest data reported were used instead in the present report.
UN Population Division, World Urbanization Prospects: The 2014 Revision	Population estimates (total, urban, rural), 2010, 2012	Population data were needed to derive the actual number of people with access to electricity and nonsolid fuels. The data were therefore also used to derive the population with access deficit. Deriving the levels allowed the authors of the present report to estimate aggregated regional information.
WHO, Global Health Observatory Data Repository, online	Deaths attributable to household air pollution, 2012	Data were used to estimate the regional contribution of Asia and the Pacific to world estimates.

continued on next page

Table 1.2 *continued*

Data Source	Country-Level Data	Notes
SE4All Country Rapid Assessment and Gap Analyses	• Targets, policies, and initiatives • Energy access data • Energy efficiency data • Renewable energy data	These reports were used mainly for the discussion on the country action processes. As the figures cited come from official estimates, the information was also used to cross-check figures reported under the GTF.
World Bank Readiness for Investment in Sustainable Energy project	Targets, policies, and initiatives	This was mainly used for the discussion on the country action processes.
Official country statistics	• Energy balances • Energy access data	Information was used to cross-check figures reported under the GTF.

GTF = Global Tracking Framework, ESCAP = United Nations Economic and Social Commission for Asia and the Pacific, IEA = International Energy Agency, UN = United Nations.

This report covers only the developing members of ADB.[4] As a pilot tracking report, it provides a snapshot view of the current status of Asia and the Pacific and its developing members with regard to the SE4All targets, and where data are available, shows the key trends over the baseline period, 1990–2010.

This summary report shows only the highlights of the research. The next three sections (i) present the key indicators used in assessing the region's performance in relation to the three SE4All targets, (ii) explore the issues surrounding the energy–women–children–health nexus in Asia and the Pacific and present case studies that document actual practices, and (iii) provide information about the country action processes and document the experience of countries that have opted into the SE4All Partnership. The final section ends the report by discussing the challenges that remain and the steps that will be taken by the SE4All partners to address those challenges.

[4] The full listing can be found on the ADB website. See: http://www.adb.org/about/members

SUSTAINABLE ENERGY FOR ALL IN ASIA AND THE PACIFIC

SUSTAINABLE ENERGY FOR ALL TARGETS | by 2030

100% Achieve universal energy access

Double the rate of improvement in energy efficiency

Double the share of renewable energy in the energy mix

STATUS OF ADB DEVELOPING MEMBERS

A. ENERGY ACCESS

ACCESS TO ELECTRICITY

electrified, 2010 **87%**

electrified, 2012 **89%**

but

492 million 2010

426 million 2012

still do not have access to electricity

ACCESS TO MODERN COOKING AND HEATING SOLUTIONS

use modern fuel, 2010 **45%**

use modern fuel, 2012 **47.5%**

but

2 billion 2010

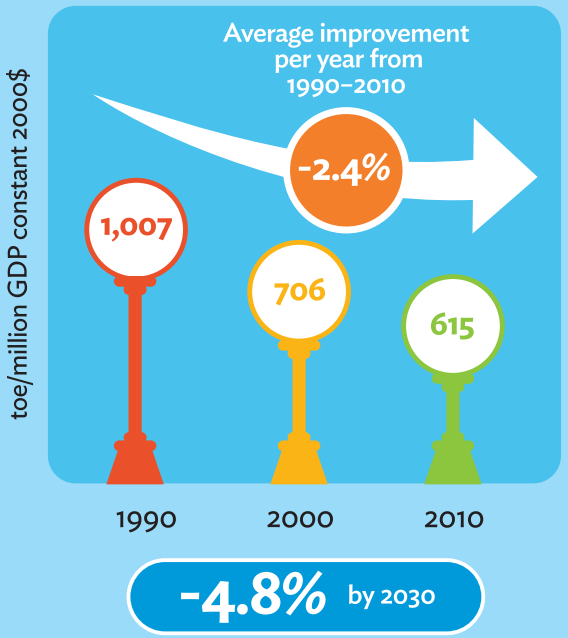
2 billion 2012

still rely on solid fuels

Source: Authors' estimates based on data on electrification rates and percentage of population relying on nonsolid fuels from the World Bank/ESMAP and IEA (2015b); and population data from the UN Population Division (n.d.).

B. ENERGY EFFICIENCY

PRIMARY ENERGY INTENSITY



-4.8% by 2030

Source: ADB (2013a).

C. RENEWABLE ENERGY

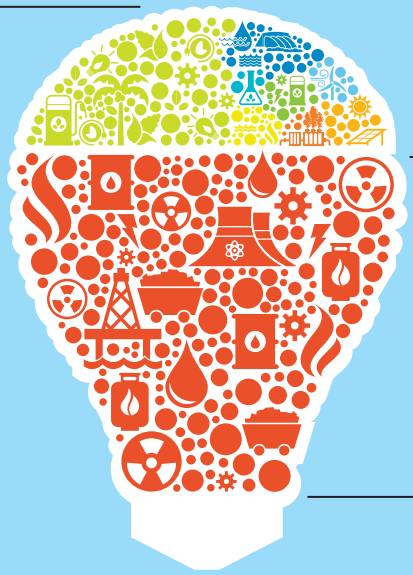
RENEWABLE ENERGY IN THE ENERGY MIX

24% in 2010

48% by 2030

24%
Total share of renewable energy in final energy demand, 2012

- 16.6% Solid biofuels, traditional
- 3.1% Hydro
- 2.4% Solid biofuels, modern
- 0.5% Solar
- 0.3% Other (biogas, renewable waste, marine)
- 0.3% Wind
- 0.2% Geothermal
- 0.1% Liquid biofuels



76%
Share of non-renewable energy, 2012

Source: Authors' estimates based on World Bank/ESMAP and IEA (2015b).

NOTES:
1. Regional estimates include only the developing members of ADB in Asia and the Pacific.
2. Access to electricity is measured as the percentage of population that has access to electricity. The number of people with access deficit was computed by multiplying the national electrification rate and total population estimates, then subtracting the product from total population. Numbers here do not match the International Energy Agency (IEA) estimates from the 2014 World Energy Outlook due to differences in: a) composition of countries; and b) primary data sources, as the Global Tracking Framework is based on household surveys, where IEA uses utility data that do not capture decentralized forms of electrification in rural areas such as off-grid solutions and stand-alone systems, and even illegal connections in urban areas.
3. Access to nonsolid fuels is measured as the percentage of population that relies primarily on nonsolid fuels. The number of people with access deficit was computed by multiplying the national percentage and total population estimates, then subtracting the product from total population. Numbers here do not match the IEA estimates from the 2014 World Energy Outlook due to: a) differences in composition of countries; and b) the estimation of IEA, which subtracts coal use from the total solid fuel use. This results in a huge difference in estimates, especially for the People's Republic of China.
4. Primary energy intensity is measured as the ratio of total primary energy demand in tonnes of oil equivalent (TOE) and the gross domestic product (GDP) in constant 2000$. The average annual growth rate was computed using the compounded annual growth rate formula.
5. Total renewable energy share in final energy demand is measured by dividing total renewable energy consumption by total final energy consumption multiplied by 100%. Disaggregated numbers do not add up to 24% due to rounding.

2 Monitoring Asia and the Pacific Performance

This section gives a snapshot view of where Asia and the Pacific countries stand in relation to the SE4All objectives of (i) ensuring universal access to modern energy services; (ii) doubling the global rate of improvement in energy efficiency; and (iii) doubling the share of renewable energy in the global energy mix. In the assessment of country-specific performance, the burden of contributing to these global objectives is assumed to be equal for all countries in the region. The same metrics are therefore applied to all economies in this report.

Universal Access to Energy

Energy access is defined both as the provision of adequate amounts of high-quality and reliable modern energy supplies, such as electricity, gas, and liquid fuels (or equivalent alternatives) as and when needed, and as the ability of individuals to purchase such supplies in the amounts deemed necessary for their daily use (ADB 2007). Sustainable energy is essential for the development of a country because it helps sustain the country's economic activities and facilitates human capital development by powering services related to health, education, water, and sanitation. It is instrumental in reducing poverty and ensuring sustainable progress. Access to sustainable energy must therefore be available to all.

The GTF uses two indicators to measure energy access. One is the proportion of the population that has access to electricity, and the other is the proportion of the population that relies on nonsolid fuels for cooking and heating.

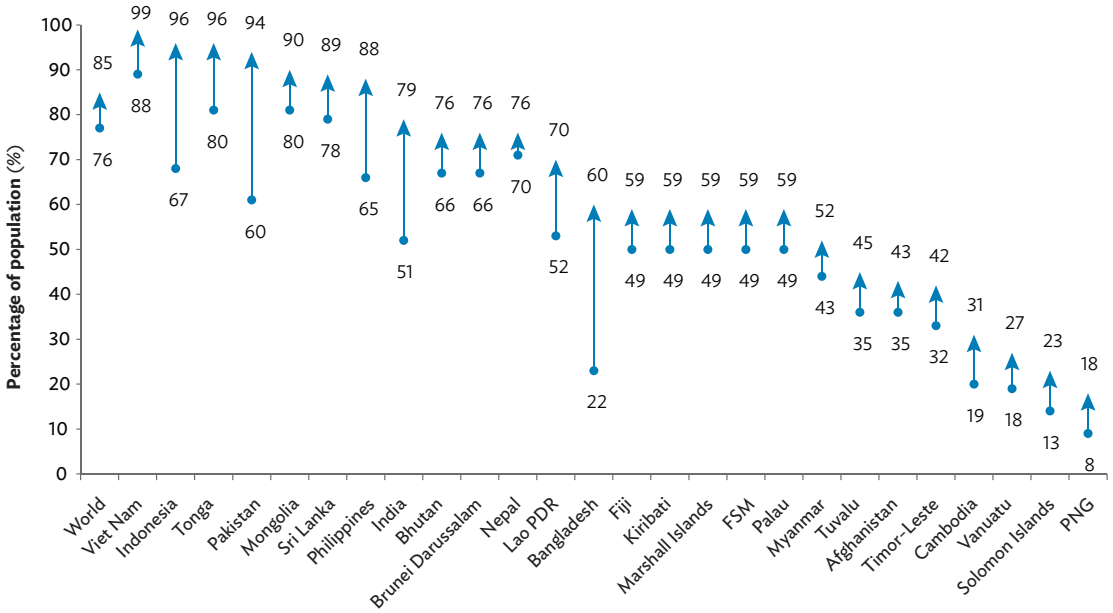
Sixteen economies reached 100% electrification in 2012[5]. The rest posted gains, with Bangladesh recording the fastest growth since 1990 (Figure 2.1). Despite this progress, however, in many countries, particularly in the Pacific region, less than 50% of the population is connected to the electricity network. Geographic limitations in island countries in the region contribute largely to the energy access challenge (UNDP 2013).

Overall, about 3.5 billion people, or 89% of the total population of Asia and the Pacific region,[6] have access to electricity. An estimated 426 million are still in the dark. The rural areas account for the majority of this access deficit, highlighting the disparity between urban and rural electrification.

[5] These are Armenia; Azerbaijan; the People's Republic of China; Hong Kong, China; Georgia; Kazakhstan; the Republic of Korea; the Kyrgyz Republic; the Maldives; Malaysia; Samoa; Singapore; Tajikistan; Thailand; Turkmenistan; and Uzbekistan.

[6] This regional population figure includes only the developing members of the Asian Development Bank. http://www.adb.org/about/members

Figure 2.1: Percentage of Population with Access to Electricity, 1990–2012 *(%)*



FSM = Federated States of Micronesia, Lao PDR = Lao People's Democratic Republic, PNG = Papua New Guinea.

Note: Presented here are Asia and the Pacific countries that have not yet reached 100% electrification. World estimates are also shown.

Source: World Bank/ESMAP and IEA (2015b).

While these numbers give an optimistic picture of the region's performance, caution must be observed in analyzing access to electricity, for various reasons. One reason is the limitations of the indicator, particularly its binary nature—individuals in households with electricity connections are counted, regardless of the source (grid or off-grid systems), quality, efficiency, and availability of electricity supply. Furthermore, comparisons with official estimates revealed discrepancies. For instance, Nepal's electrification rate of 14% in the 1990s[7] was significantly below that reported in the GTF. Other differences were noted when comparisons were made with 2012 data in the IEA electricity database. The GTF recorded electrification rates of 96% for Indonesia, 94% for Pakistan, and 88% for the Philippines. The IEA estimates were much lower, at 76%, 69%, and 70%, respectively. These differences resulted in a regional estimate of access deficit (426 million) that is significantly lower than the 620 million people reported by the IEA and used by ADB in its previous reports. Differences in definition, method of estimation, and data sources are likely explanations for the discrepancy.[8]

[7] This was the estimated rate at the end of 1997, according to the Ninth Plan, a strategy document of the Government of Nepal's National Planning Commission for 1998–2002. http://www.npc.gov.np/web/new/uploadedFiles/allFiles/ninth_eng.pdf

[8] According to the GTF, electrification data estimates are based on household surveys. Where there are missing data points across the time series, statistical models are developed to fill the gap (World Bank and IEA 2014). The IEA database makes use of utility data, which fail to capture decentralized forms of electrification in rural areas, such as off-grid solutions and stand-alone systems, and even illegal connections in urban areas (World Bank/ESMAP and IEA 2015b).

To address the limitations of the first indicator, a multitier framework for measuring household access to electricity, using the electricity consumption indicator, was developed under the GTF (Table 2.1). The tiers reflect the level of access, with higher tiers signifying progression in the services and appliances that can be used.[9] An accompanying multitier framework, also developed under the GTF, is a useful guide to the type of electricity services that households in the various tiers can avail themselves of (Table 2.2). However, since household size varies across countries, indicators relying on electricity consumption per household could be misleading. Consumption on a per capita basis should also be considered.

Table 2.1: Multitier Framework for Measuring Access to Household Electricity Services Based on Consumption (kilowatt-hours per year)

Item	Tier 0	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Annual consumption level	<4.5	≥4.5	≥73	≥365	≥1,250	≥3,000

Source: World Bank/ESMAP and IEA (2015b), Table A1.2 (Multitier Matrix for Measuring Access to Household Electricity Consumption).

Table 2.2: Multitier Framework for Measuring Access to Household Electricity Services Based on Type of Appliance Used

Item		Tier 0	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Tier Criteria			Task lighting and phone charging	General lighting, television, and fan (if needed)	Tier 2 criteria plus any medium-power appliances	Tier 3 criteria plus any high-power appliances	Tier 4 criteria plus any very-high-power appliances
Type of Appliance	Indicative list of appliances		Very-low-power appliances	Low-power appliances	Medium-power appliances	High-power appliances	Very-high-power appliances
	Lighting		Task lighting	Multi-point general lighting			
	Entertainment and communication		Phone charging, radio	Television, computer	Printer		
	Space cooling and heating			Fan	Air cooler		Air conditioner,* space heater*
	Refrigeration				Refrigerator,* freezer*		
	Mechanical load				Food processor, washing machine, water pump		
	Product heating					Iron, hair dryer	Water heater
	Cooking				Rice cooker	Toaster, microwave	Electric cooker

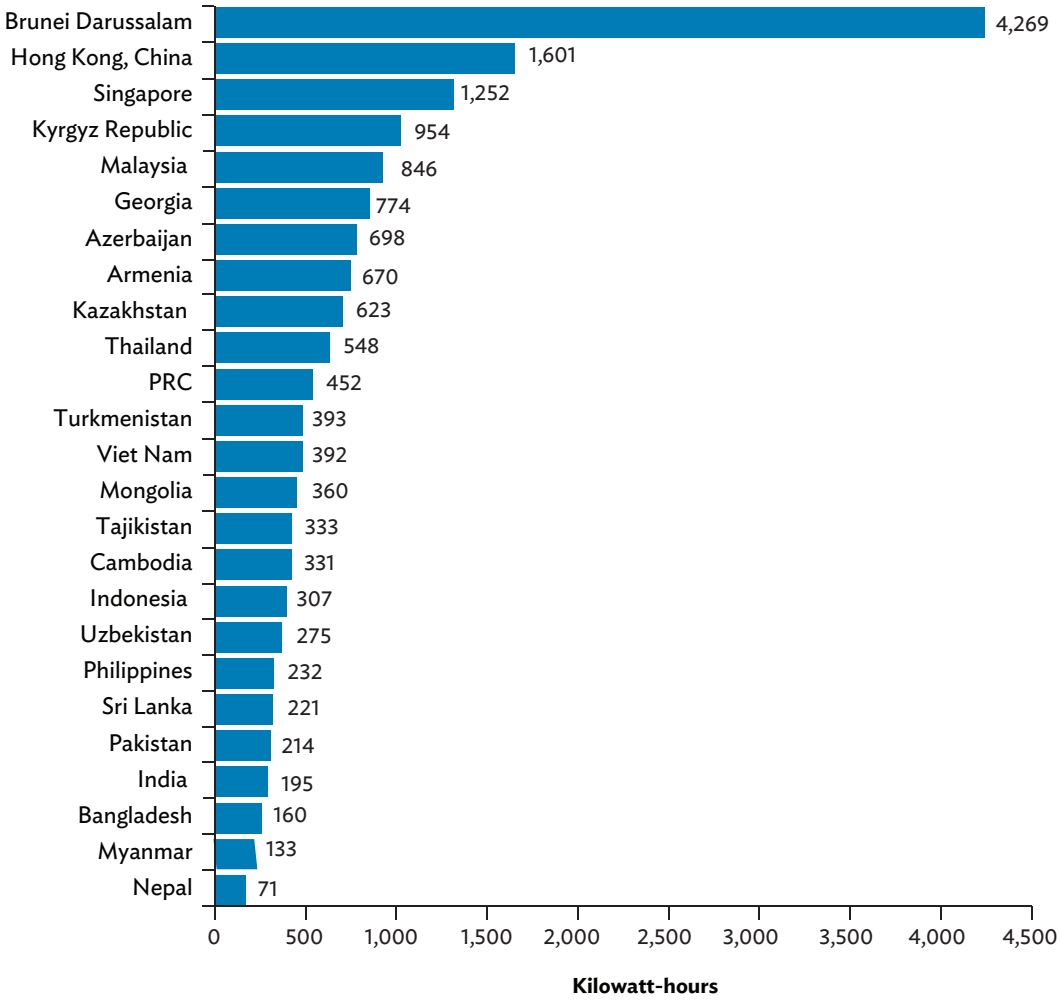
* Intermittent use.

Source: World Bank/ESMAP and IEA (2015b), Table A1.1 (Multitier Matrix for Measuring Access to Household Electricity Services).

[9] Under the GTF methodology, an estimated annual consumption for each tier was derived by multiplying an indicative number of hours of use for a range of appliances by their typical power load in watts (World Bank/ESMAP and IEA 2015b).

This report attempts to measure the per capita electricity consumption of developing economies in the Asia and the Pacific, thereby ensuring that the residential consumption of electricity is spread among the population with access to electricity, and not the entire population (Figure 2.2). According to the 2012 figures, per capita electricity consumption was highest in Brunei Darussalam, at 4,269 kilowatt-hours per year, because of the country's relatively low electricity tariff (Ahmad and Othman 2014).

Figure 2.2: Per Capita Residential Consumption of Electricity in Selected Asia and the Pacific Developing Economies, 2012
(kWh per year)



kWh = kilowatt-hour, PRC = People's Republic of China.

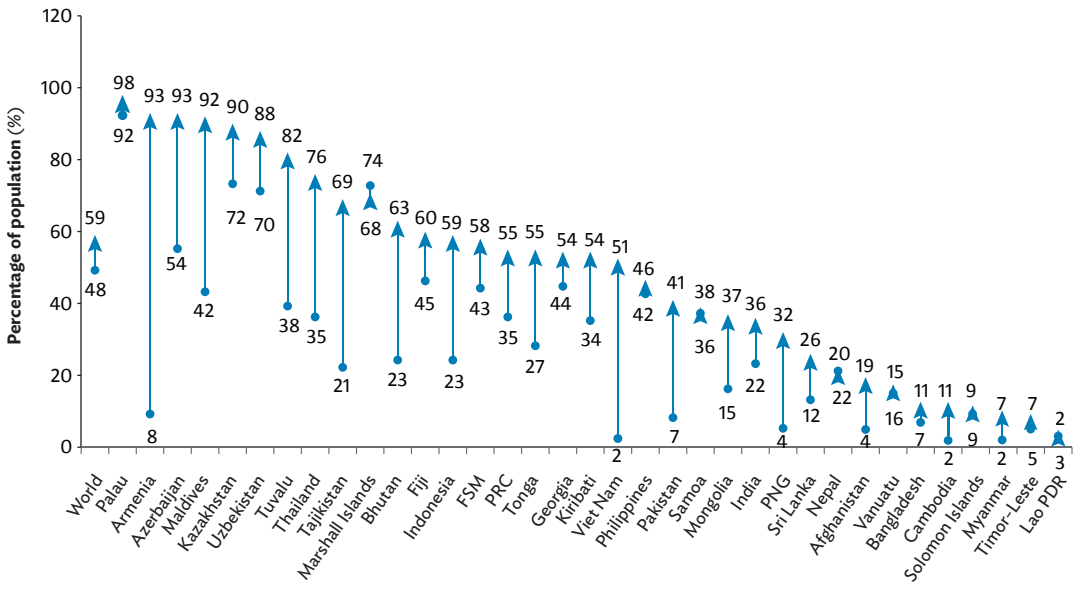
Notes:
1. Only ADB developing members with data are shown here.
2. To compute per capita consumption of electricity, residential use of electricity was divided by the number of people with access to electricity.
3. To compute the population with access to electricity, the national electrification rate was multiplied by the total population of the country.

Sources: Authors' estimates based on energy balance data from IEA (2014a); population estimates from the UN Population Division's World Urbanization Prospects (rev. 2014), accessed 26 June 2015; and electrification data from World Bank/ESMAP and IEA (2015b).

The second energy access indicator pertains to access to modern cooking and heating solutions. The GTF indicator for this is the percentage of the population that uses nonsolid fuels (fuels other than wood, charcoal, and animal and crop waste) for cooking. Only four economies in Asia and the Pacific rely primarily on nonsolid fuels for cooking and heating. For the rest, an uptrend is generally observed in most countries, with Armenia taking the lead (Figure 2.3). But even with these improvements, solid fuels remain the primary fuel for some 2 billion people in Asia and the Pacific, or 70% of the world's population without access to modern fuels.

This indicator, however, has limitations. It does not capture fuel stacking, or the use of multiple fuels in a given household, and thus misses an opportunity to deepen the analysis. The practice accounts for the varying preferences in the use of fuels, which are not influenced solely by income (Masera, Saatkamp, and Kammen 2000). A study in India (Lambe and Atteridge 2012) found that women cooking for households tended to use cow dung and fuelwood rather than liquefied petroleum gas (LPG) when preparing roti, a household staple, because of the difference in taste.

Figure 2.3: Percentage of Population Relying Primarily on Nonsolid Fuels 1990–2012 *(%)*



FSM = Federated States of Micronesia, Lao PDR = Lao People's Democratic Republic, PNG = Papua New Guinea, PRC = People's Republic of China.

Notes:

1. Presented here are countries where less than 100% of the population relies on nonsolid fuels. World estimates are also shown.
2. These GTF estimates are based on data from the World Health Organization household energy database, which provides estimates of the percentage of the population that uses solid fuels as primary fuel for cooking, based on household surveys (World Bank/ESMAP and IEA 2015a).

Source: World Bank/ESMAP and IEA (2015b).

Another limitation is the assumption that solid fuels are inherently traditional and unsustainable. Sustainability has less to do with the fuels themselves than with their production, use, and impact on health and the environment (GIZ 2014). The development of improved biomass cookstoves has mostly addressed efficiency, pollution, and safety issues. These cookstoves are sound as well as cheaper alternatives, as the fuel requirement is still relatively cheap compared with LPG or electricity. Moreover, in some countries, such as India and Nepal, national policies supporting forest conservation complement the cookstove programs (FAO 1990; Luintel et al. 2009; Lambe and Atteridge 2012). Given these considerations, the GTF is also developing a multitier framework in analyzing access to cooking solutions.

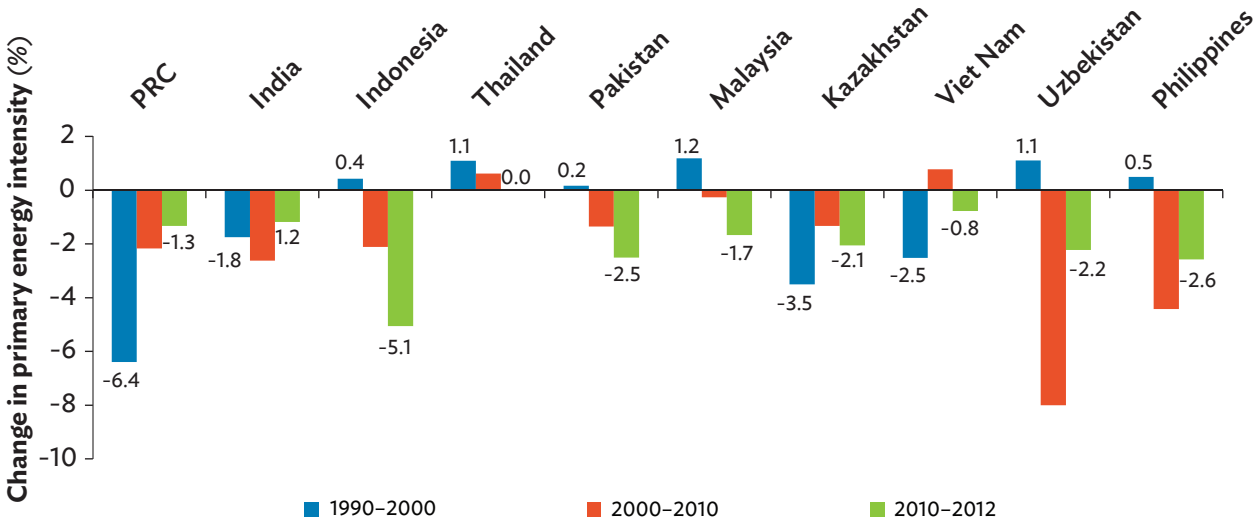
Improving Energy Efficiency

Energy efficiency is defined as the "ratio between the useful output of the end-use service and the associated energy input" (World Bank and IEA 2014). The IEA (2014b) defines it as the relationship between the energy requirements of a certain device (for example, a light bulb, boiler, or motor) and the service that the technology provides (for example, lighting, space heating, or motor power). In other words, energy efficiency can be equated with delivering more services for the same energy input, or delivering the same services for less energy input. It can be achieved through better performance, the use of more energy-efficient equipment, or a change in consumer habits. The experience of many countries in Asia and the Pacific provides the economic case for achieving this goal. In the PRC and India, for example, energy efficiency initiatives have reduced energy intensity and resulted in energy savings (ADB 2013b). Energy efficiency is also an important enabler for energy access. Greater efficiency frees up resources to expand the reach of energy, lowers the cost of energy for consumers, and creates a surplus that allows more energy to be used for productive undertakings.

Many indicators can be used to measure energy efficiency. One is energy intensity, or the ratio of energy consumption to gross domestic product (GDP) or some other economic indicator. It is commonly used as proxy or headline indicator for energy efficiency: a decreasing ratio is seen as an improvement, and an increasing ratio, a deterioration, over a period of time. Among the top contributors of primary energy demand in developing Asia and the Pacific, energy intensities have been decreasing—if not decelerating in compounded annual growth rate, as in Thailand—since 1990, and especially in the most recent years (Figure 2.4). The top four countries—the PRC, India, Indonesia, and Thailand—are likewise classified as high-impact countries under the GTF, given their significant contribution to global primary energy demand, and could thus affect the achievement of the global SE4All objectives.

Worth noting, however, are the limitations of primary energy intensity as a proxy indicator. Economic sectors have different processes and therefore also varying energy requirements, but the differences are lost in the process of using an economic indicator as large as GDP. This fact is widely recognized in the literature, hence the move to keep indicators as disaggregated as possible. Given the complexity of sector-specific characteristics, comparison across countries might be challenging, especially as countries also have varying sectors and services. Moreover, the ratio's movement across time could be attributed to the many factors influencing both the numerator (energy demand) and the denominator (GDP).

Figure 2.4: Primary Energy Intensity among the Top 10 Primary Energy Consumers, 1990–2012
(%)



PRC = People's Republic of China.

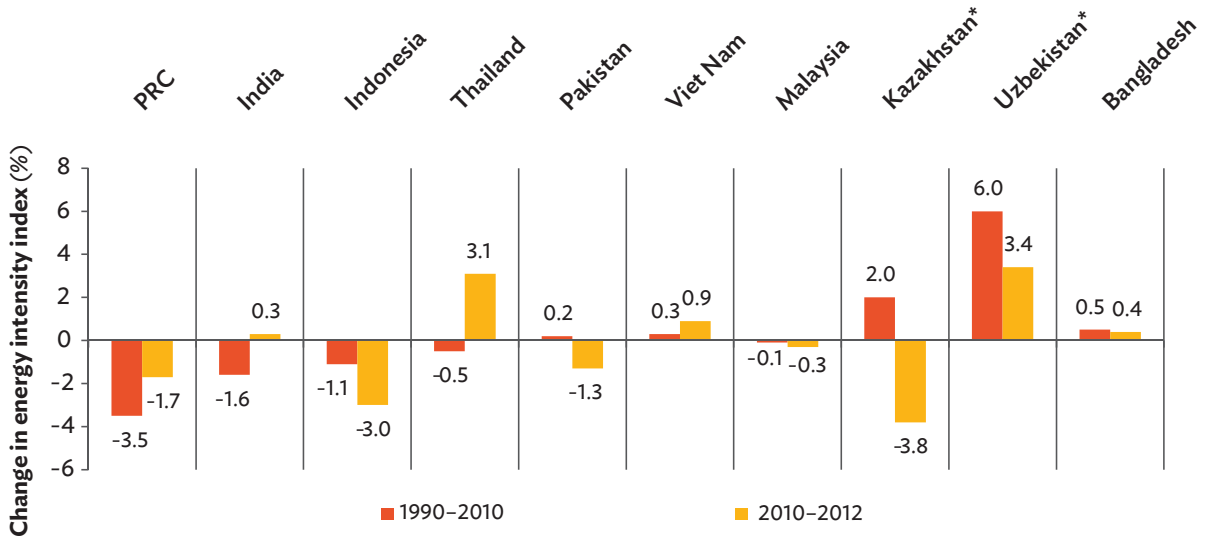
Notes:
1. Presented here are the countries with the highest total primary energy supply in 2012, ranked in descending order from left to right.
2. To compute primary energy intensity, primary energy consumption (in megajoules) was divided by gross domestic product (in 2011 purchasing power parity terms). Changes are shown on the chart in compounded annual growth rates.

Sources: World Bank/ESMAP and IEA (2015b); and IEA (2014a) for data on total primary energy supply.

To address some of the indicator's limitations, energy efficiency can be measured through the decomposition method of analysis. This method isolates the energy efficiency component from other factors affecting energy demand, such as economic structure and economic activity. The Logarithmic Mean Divisia Index (LMDI) was used under the GTF to net out the energy intensity factor, which accounted for the contribution of energy efficiency improvements to the reduction in energy demand, indexed to the base year 1990. The GTF computations show deteriorating energy efficiency in recent years in some of the countries with the highest energy demand (Figure 2.5), as evidenced by the positive compounded annual growth rates for energy intensity between 2010 and 2012. The PRC, Indonesia, and Malaysia, on the other hand, have consistently improved their energy efficiency since 1990.

The decomposed energy intensity index derived from the LMDI was also used in computing the cumulative avoided energy consumption, which represented the difference between hypothetical energy consumption—energy intensity remaining at its 1990 level—and actual consumption. GTF data showed that the PRC, the top consumer of energy, produced the highest cumulative savings from 1990 to 2012, at 867,500 exajoules as a result of its continuous improvements in energy efficiency (Figure 2.6).

Figure 2.5: Energy Intensity Component of Final Energy Demand among the Top 10 Energy Consumers, 1990–2012 (%)



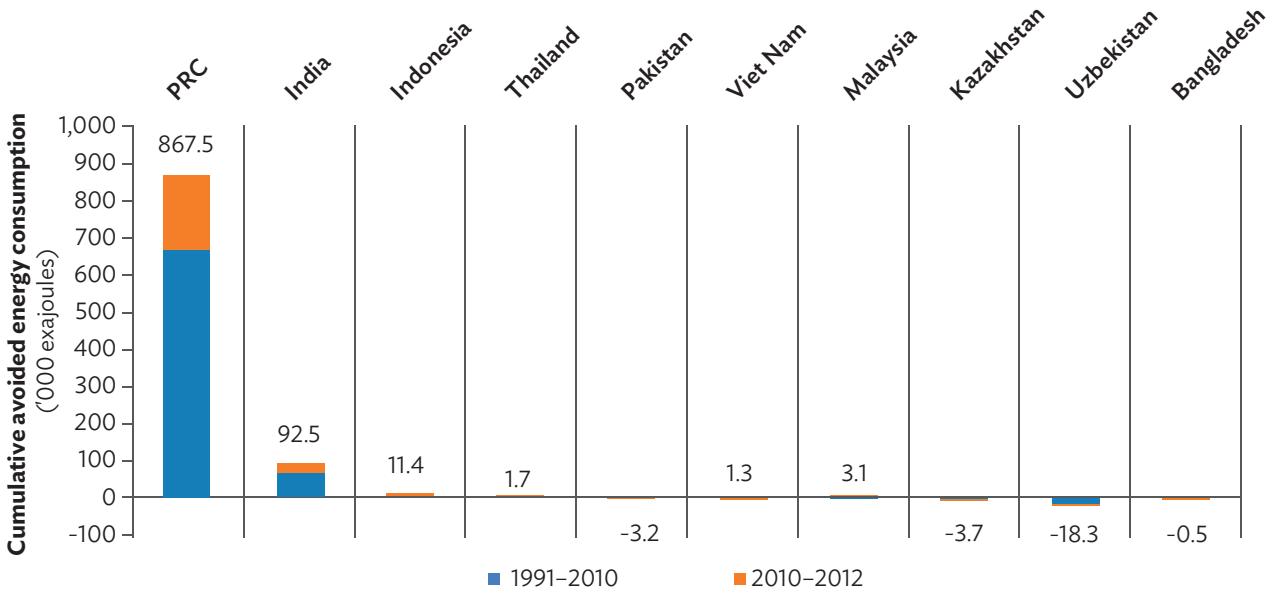
PRC = People's Republic of China.

Notes:

1. Presented here are countries with the highest total final energy consumption in 2012, ranked in descending order from left to right. Those marked with an asterisk have incomplete data for 1990–2010.
2. The Logarithmic Mean Divisia Index was used under the Global Tracking Framework to decompose the changes in total final energy demand into different factors: energy intensity, activity level, and economic structure. The factors were then indexed to the base year 1990. The energy intensity index presented is the aggregate energy intensity index for the end-use sectors, and is therefore an economy-wide decomposition index. The growth rates shown are the compounded annual growth rates for the economy-wide energy intensity index for the periods 1990–2010 and 2010–2012.

Source: World Bank/ESMAP and IEA (2015b).

Figure 2.6: Cumulative Avoided Energy Consumption of Top 10 Energy Consumers, 1991–2012
('000 exajoules)



PRC = People's Republic of China.

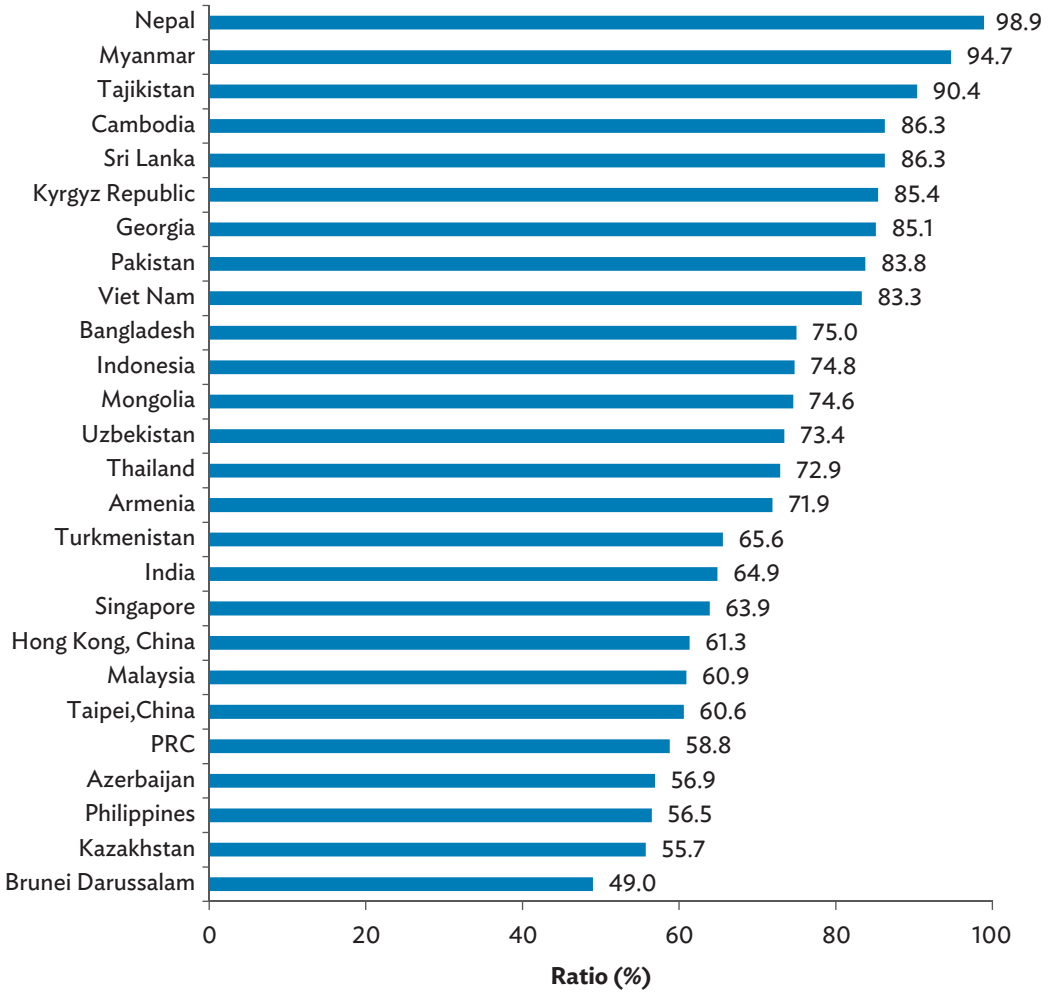
Notes:
1. Presented here are 10 countries with the highest total final energy consumption and their respective avoided energy consumption from 1991 to 2012, relative to the base year 1990.
2. The cumulative avoided energy consumption was derived through the decomposition method of analysis. This represents the energy savings, should energy intensity remain at the 1990 (base year) level.

Source: World Bank/ESMAP and IEA (2015b).

Another useful indicator is the ratio of final energy consumption to primary energy consumption, which measures overall energy conversion efficiency. A higher ratio represents lower energy conversion and transmission losses. In countries where primary energy is mostly used directly to meet final energy demand, efficiency will be relatively higher. With 2012 data from the IEA's non-OECD energy balances, the ratio was computed for developing members in Asia and the Pacific. Nepal took the lead, at 98.9%, followed by Myanmar with 94.7% (Figure 2.7). Caution should, however, be observed in comparing across countries as the indicator is influenced by resource endowment factors.[10] A higher ratio for a country does not imply that its overall energy system efficiency is better than that of other countries.

[10] According to the GTF, primary energy and final energy will be more directly related in a country with a significant hydroelectric sector. In a country rich in geothermal energy, on the other hand, the ratio of final energy consumption to primary energy consumption will be lower because of the low thermodynamic quality of the primary resource (World Bank and IEA 2014).

Figure 2.7: Ratio of Final Energy Consumption to Primary Energy Consumption of Selected Asia and the Pacific Developing Members, 2012 (%)



PRC = People's Republic of China.

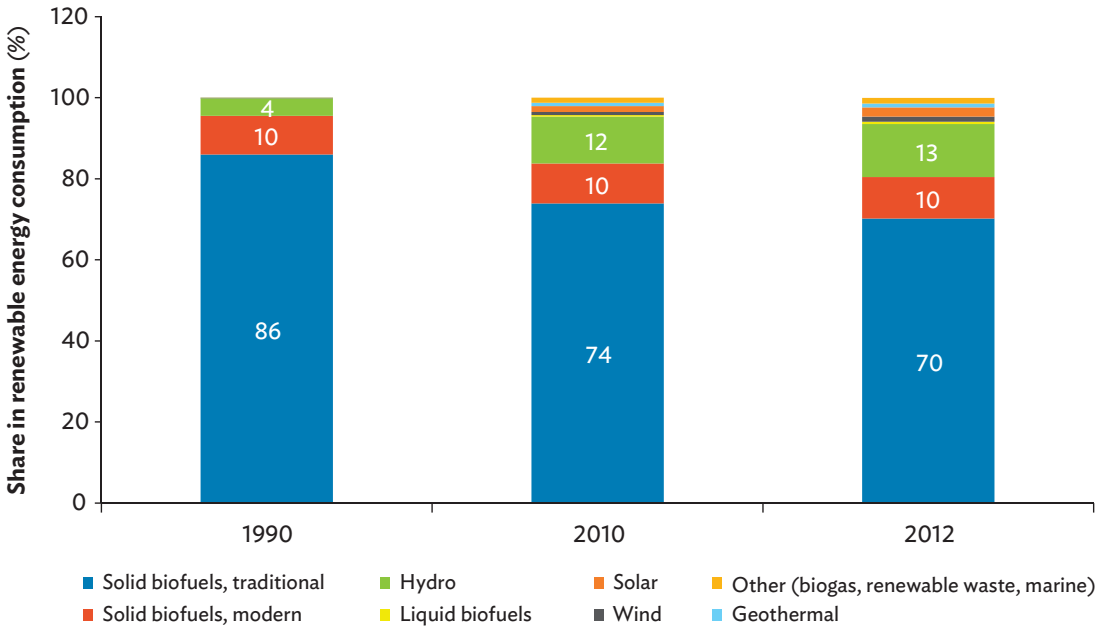
Notes:
1. Only ADB developing members with available data are shown here.
2. Total final energy consumption was divided by total primary energy supply and the result multiplied by 100% to compute the indicator. Energy efficiency increases as the ratio moves closer to 100%, as less energy is lost during the conversion process.

Source: Authors' estimates based on energy balances data from IEA (2014a).

Doubling the Share of Renewable Energy in the Energy Mix

Renewable energy sources, according to the GTF, are replenished as they are consumed and are usually but not necessarily indigenous. As defined, this resource category includes wind, solar, hydro, geothermal, biomass, biofuels, and ocean energy. Solid, and especially traditional, biofuels account for the biggest share in the total consumption of renewable energy in Asia and the Pacific (Figure 2.8). But that share has been decreasing since 1990 as the use of hydro, wind, solar, and geothermal energy has increased.

Figure 2.8: Share of Various Renewable Energy Sources in Asia and the Pacific's Renewable Energy Consumption, 1990–2012 (%)



Notes:

1. The sum of all country values was computed to aggregate data by type of renewable energy technology to the regional level. Each renewable energy technology was divided by total renewable energy consumption in the region and the results were multiplied by 100%.

2. Missing data for ADB developing members were not imputed.

3. In the absence of 2010 data, 2009 figures were used for the following countries: Afghanistan, Bhutan, Fiji, Kiribati, Lao People's Democratic Republic, Maldives, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu.

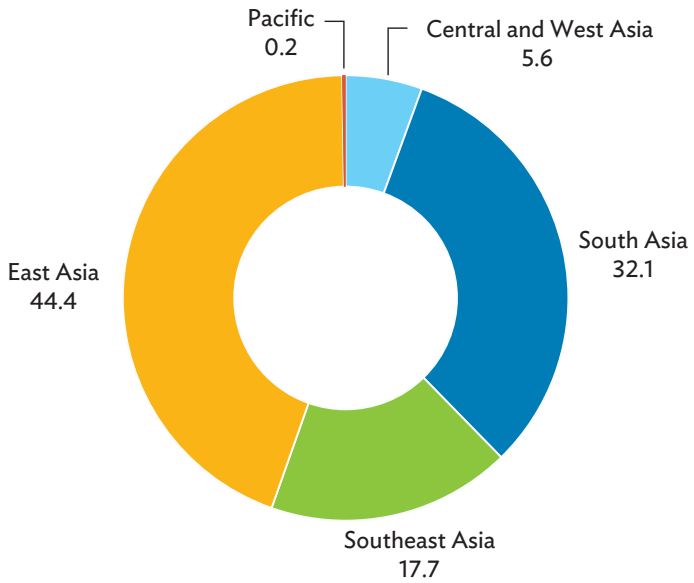
Source: Authors' estimates based on World Bank/ESMAP and IEA (2015b); and the World Bank Global Tracking Framework database, accessed 15 January 2015.

By region, renewable energy consumption in East Asia (44.7% of the regional total) and South Asia (31.1%) made up the bulk of total renewable energy consumption in Asia and the Pacific in 2012 (Figure2.9). The PRC and India together accounted for 75% of the total.

The SE4All targets a doubling of the share of renewable energy in the energy mix by 2030 from the 2010 level. To track progress toward this objective, the GTF prescribes the use of the ratio of renewable energy consumption to total final energy demand, as indicator. The GTF uses total final energy demand instead of primary energy demand because of the limitations of the latter with regard to conversion efficiencies (World Bank and IEA 2014). On the other hand, total final energy demand excludes transmission and distribution losses, which should be considered. This report uses both indicators in examining country-specific data.

At the regional level, Asia and the Pacific has the third-highest share of renewable energy in total final energy consumption (24%) among the world's regions (Figure 2.10), and is second only to sub-Saharan Africa in reliance on solid biofuels. Excluding solid biofuels, the share of renewable energy for Asia and the Pacific stands at only 4.6%.

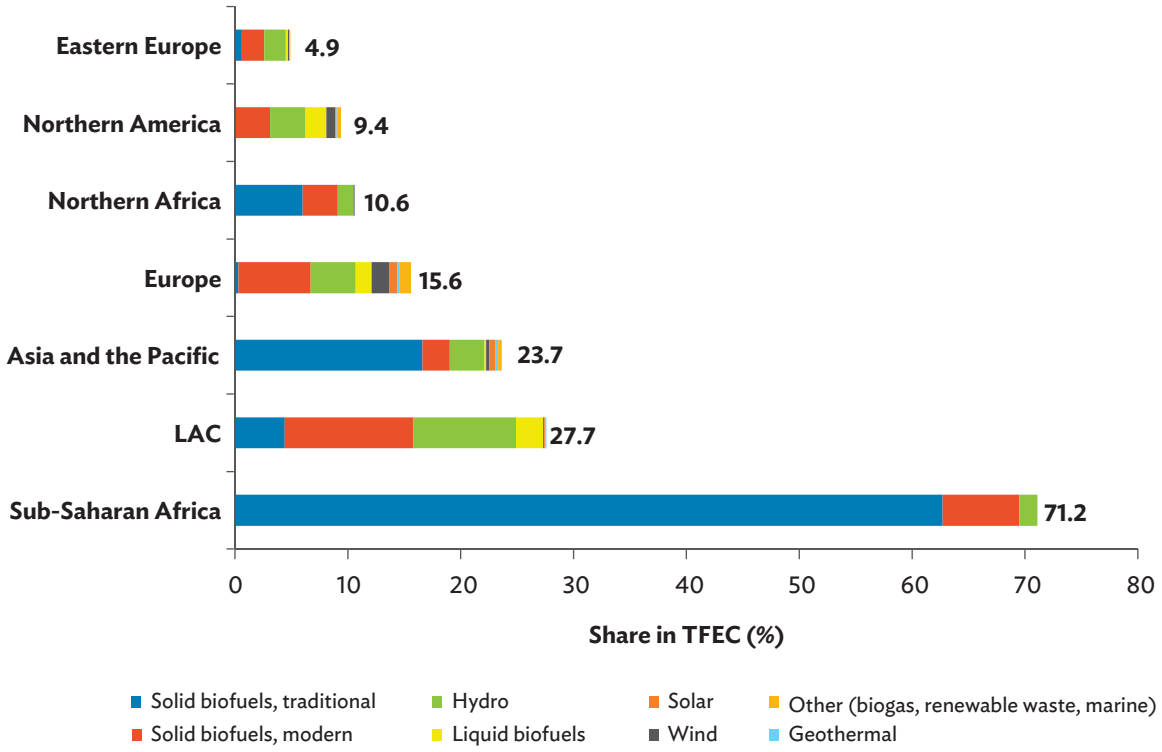
Figure 2.9: Share of the Various Regions in Renewable Energy Consumption in Asia and the Pacific, 2012 *(%)*



Notes:
1. Total renewable energy consumption is the sum of the following renewable energy components: solid biofuels, traditional; solid biofuels, modern; hydro; liquid biofuels; wind; solar; geothermal; and other sources (biogas, renewable waste, and marine).
2. To compute the renewable energy consumption total for Asia and the Pacific, all renewable energy consumption values for the various countries were summed up. Then the contribution of each country to Asia and the Pacific total was computed (the sum of all these shares had to be equal to 100%). These shares were then summed up by region (the total of region shares had to be equal to 100%).
3. Missing data for ADB developing members were not imputed.

Source: Author's estimates based on World Bank/ESMAP and IEA (2015b).

Figure 2.10: Share of Regional Renewable Energy Consumption in Total Final Energy Consumption, 2012 (%)



LAC = Latin America and the Caribbean, TFEC = total final energy consumption.

Notes:

1. All country values for renewable energy consumption, by technology type, were first summed up to compute Asia and the Pacific's share of renewable energy consumption in total final energy consumption (TFEC). Then each component was divided by the sum of all TFEC values for the countries. Missing values were not imputed.
2. All regions other than Asia and the Pacific follow the Global Tracking Framework's regional classification. Asia and the Pacific grouping follows the Asian Development Bank listing of developing members.

Source: Authors' estimates based on World Bank/ESMAP and IEA (2015b).

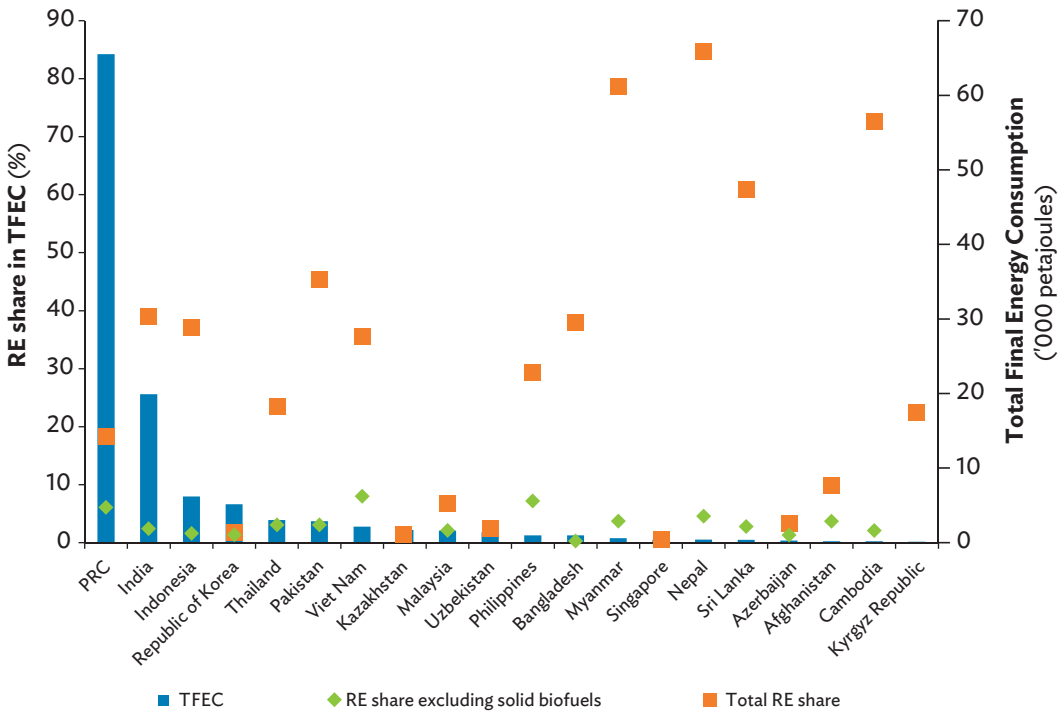
The GTF distinguishes modern from traditional solid biofuels on the basis of sustainability criteria. However, the problematic definition[11] and insufficient data blur the distinction and limit the usefulness of the analysis. Efforts are therefore being made under the GTF to develop better methods of defining and collecting bioenergy data to better distinguish modern (sustainable) from traditional (unsustainable) uses of solid biofuels. Classifying unsustainable solid biofuels like traditional biomass as renewable energy was, however, criticized during the consultation workshop.

[11] It follows the IEA definition: "Traditional biomass use refers to the use of fuelwood, animal dung, and agricultural residues in simple stoves with very low combustion efficiencies. Traditional biomass use is estimated here as the use of solid biomass in the residential sector of non-OECD countries, excluding countries in non-OECD Europe and Eurasia" (World Bank/ESMAP and IEA 2015b).

As a temporary solution, this report excludes solid biofuels from the indicator measuring the share of renewable energy, and thereby classifies all solid biofuels as unsustainable. But the unadjusted indicator is also shown for comparison, to call attention to the dependence of countries on solid biofuels.

The share of total renewable energy consumption, counting solid biofuels, in the total final energy demand of the top 20 energy consumers in the region ranges from 0.5% in Singapore to Nepal's 84.7% (Figure 2.11). Excluding solid biofuels, however, Singapore's renewable energy share remained at 0.5% while Nepal's dropped to 4.4%. Using primary energy demand as the denominator results in the same trend. Nepal and Myanmar—countries with the highest renewable energy share in primary energy demand, at 84% and 75%, respectively—witnessed a drop in their renewable energy share to 4.6% and 4.4%, respectively, when solid biofuels are taken out of the equation (Figure 2.12). Meanwhile, Tajikistan has the highest nonbiomass renewable energy share in both primary and final energy consumption at 64% and 58%, respectively, with hydro as the only renewable energy source in its portfolio.

Figure 2.11: Share of Renewable Energy in the Total Final Energy Consumption of the Top 20 Energy-Consuming Countries in Asia and the Pacific, 2012 (%)

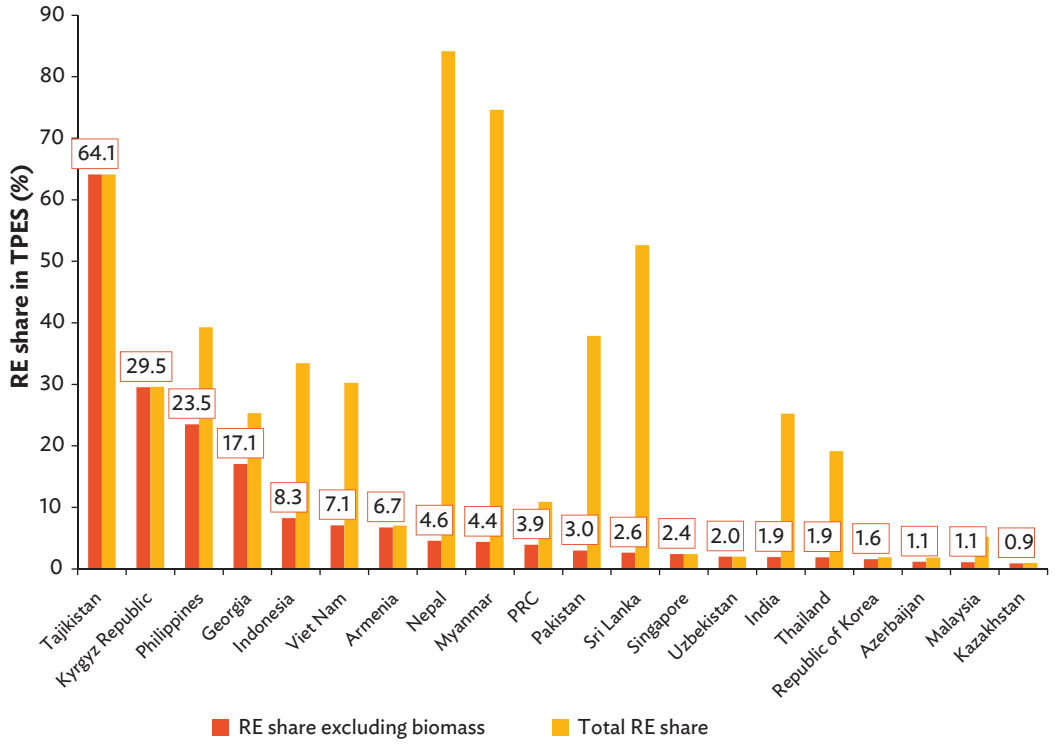


PRC = People's Republic of China, RE = renewable energy, TFEC = total final energy consumption.

Notes:
1. Presented here are 20 countries with the highest total final energy consumption, ranked in descending order from left to right.
2. To compute the share of renewable energy, excluding solid biofuels, the share of traditional and modern solid biofuels was subtracted from the total renewable energy share of each country.

Source: Authors' estimates based on World Bank/ESMAP and IEA (2015b).

Figure 2.12: Top 20 Countries with the Highest Share of Nonbiomass Renewable Energy in Total Primary Energy Supply, 2012 (%)



PRC = People's Republic of China, RE = renewable energy, TPES = total primary energy supply.

Notes:

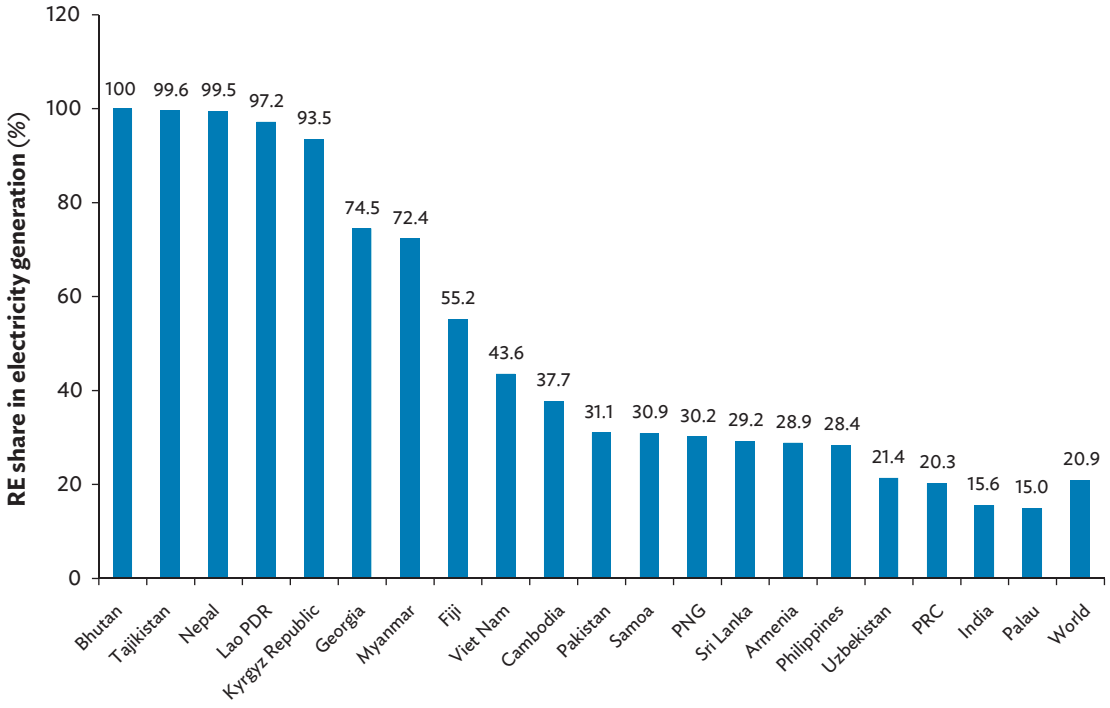
1. This chart presents the 20 Asia and the Pacific countries with the highest nonbiomass renewable energy share in total primary energy supply, ranked in descending order from left to right. Nonbiomass renewable energy share is defined here as total renewable share, excluding solid biofuels.
2. Solid biofuel production was subtracted from each country's total renewable energy production to compute its renewable energy share, excluding solid biofuels. Then this adjusted total renewable energy production was divided by total primary energy supply and multiplied by 100%.
3. Total renewable energy production comprises the primary energy equivalent of hydro (excluding pumped storage), geothermal, solar, wind, and wave and tidal energy, as well as solid biofuels, biogasoline, biodiesel, other liquid biofuels, biogas, and municipal waste.

Source: Authors' estimates based on data from ESCAP (2014).

As an additional indicator of renewable energy consumption, the share of renewable energy in electricity generation supplements the analysis of the role of renewable energy in meeting the power needs of a country's, and particularly those of its end users. A higher share indicates less dependence on imported fossil-based energy sources, insulating the country from shocks associated with price swings in the international market, and, to a larger extent, promoting the country's energy security (UNDP 2013).

Almost all countries with the highest share of renewable energy in electricity generation in Asia and the Pacific have shares that exceed the world average of 20.9%. Topping the list is Bhutan, which generates 100% renewable electricity, followed by Tajikistan and Nepal, whose ratios almost reach 100% (Figure 2.13). These three countries rely largely on hydroelectric power generation.

Figure 2.13: Top 20 Countries with the Highest Share of Renewable Energy in Electricity Generation, 2012 *(%)*



Lao PDR = Lao People's Democratic Republic, PNG = Papua New Guinea, PRC = People's Republic of China, RE = renewable energy.

Notes:
1. The figure for Bhutan was computed on the basis of official estimates of electricity supply and generation taken from Bhutan National Statistics Bureau (2013).
2. For Lao PDR and Samoa, the figures presented here are 2011 estimates reported in World Bank (2015).
3. For PRC, the figure is computed from data in IEA (2014a).

Sources: World Bank/ESMAP and IEA (2015b); World Bank (2015); and Bhutan National Statistics Bureau (2013).

However, some countries are at a disadvantage given the uneven distribution of renewable resources. Fortunately, cross-border electricity trade or power pools are being introduced to fill this gap, allowing areas with high generation costs to import power at relatively lower costs—and cleaner power, at that. However, such type of power market requires adequate cross-border transmission capacity in integrating renewables, especially those that are fluctuating like wind and solar photovoltaics. As the trend moves to this direction, domestic generation might lose its significance, making domestic consumption a more accurate indicator in evaluating the role of renewable energy. This could be one of the indicators that should be included in the tracking system.

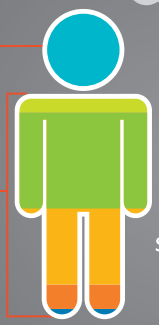
ENERGY–WOMEN–CHILDREN–HEALTH NEXUS

WITHOUT SUSTAINABLE ENERGY

Women and children are burdened with collecting traditional fuels such as dung, fuelwood, charcoal, and agriculture residues.

Across the world, women and girls spend **up to 20 hours a week** collecting these fuels.[1]

Household indoor air pollution attributable deaths, 2012 ('000)



- 848 REST OF THE WORLD
- 3,413 ASIA AND THE PACIFIC
- 184 Central & West Asia
- 1,471 East Asia
- 1,378 South Asia
- 375 Southeast Asia
- 5 Pacific

80% of deaths from indoor air pollution in 2012 were from ADB developing members in Asia and the Pacific.[2]

WOMEN AND CHILDREN HAVE HIGHER RISKS[3]

Health outcome	Evidence	Population	Relative risk
Acute infections of the lower respiratory tract	STRONG	Children aged 0-4 years	2.3
Chronic obstructive pulmonary disease	STRONG	Women aged ≥ 30 years	3.2
	MODERATE I	Men aged ≥ 30 years	1.8
Lung cancer	STRONG	Women aged ≥ 30 years	1.9
	MODERATE I	Men aged ≥ 30 years	1.5

Studies show that in the developing world:

291 million children go to unelectrified schools[4]

1 billion are served by health facilities without electricity[5]

50% of vaccines perish due to lack of energy for cold storage[6]

WITH SUSTAINABLE ENERGY

ENERGY FORM	NEEDS OF WOMEN AND CHILDREN[7]		
	Practical	Productive	Strategic
Electricity	Pumping water, reducing need to haul and carry Mills for grinding Lighting improves working conditions at home	Increase possibility of activities during evening hours like social activities for women and studying for children Provide refrigeration for food production and sale Power for specialised enterprises such as hairdressing and internet cafes Mechanization of farming and agroprocessing enables women participation in these industries	Makes streets safe, allowing participation in other activities Open horizons through radio, TV, and internet
Improved biomass (supply and conversion technology)	Improves health through better stoves Less time and effort in gathering and carrying fuelwood	More time for income-generating activities for women and schooling for children Lower cost of process heat for income generating activities	Control of natural forests in community forestry management frameworks

Studies show that:

3 hours a day saved from collecting fuelwood due to biogas *(Nepal)*[8]

28.1% reduction on fuelwood use due to improved cookstoves *(South Asia)*[9]

2 years — difference in schooling years for children in electrified households versus unelectrified households *(Philippines)*[10]

Sources:
1. ADB (2012); 2. Authors' estimates based on WHO (2015), only ADB developing members are included in the regional estimate for Asia and the Pacific; 3. WHO (2006); Strong evidence = Many studies of solid fuel use in developing countries, supported by evidence from studies of active and passive smoking, urban air pollution and biochemical or laboratory studies; and Moderate I: strong evidence for specific age/sex groups. The relative risk indicates how many times more likely the disease is to occur in people exposed to indoor air pollution than in unexposed people; 4. Practical Action (2013); 5. Practical Action (2013); 6. Practical Action (2013); 7. Adapted from Clancy, J. S., M. Skutsch, and S. Batchelor (2003); 8. ADB (2012); 9. Practical Action (2014a); and 10. World Bank (2008).

3 The Energy–Women–Children–Health Nexus

Introduction

How does gender affect access to energy services, and vice versa? On the one hand, because their subsistence and productive tasks give them a significant role in energy systems, women are disproportionately affected by energy poverty. At the same time, their lives, as well as men's lives, can be transformed by access to energy. There is less manual labor, more comfort and convenience. Polluting energy forms, such as fuelwood and kerosene, are less used. New income-generating options arise, existing opportunities improve, and information and entertainment become more accessible.

Men and women, however, differ in their energy needs and access. They may therefore also experience the impact of energy services differently. According to the World Bank's Gender at Work report (2014), "on virtually every global measure, women are more economically excluded than men." Compared with men, fewer women in less developed regions have cash income. Women account for two-thirds of the world's 774 million adult illiterates, spend at least twice as much time as men doing unpaid domestic work, and, if employed, spend an inordinate amount of time and energy juggling work and family responsibilities. Their lack of official rights or ownership of resources limits their economic autonomy and leaves them defenseless against economic or environmental shocks. In South Asia, women earn only 20%–40% of what men earn, even after factors such as education and employment type are taken into account. To ensure equitable access to energy, these differences must be factored in.

Moreover, women and children bear the brunt of the negative effects of energy poverty. Without access to modern energy, they are subjected to the ills of indoor air pollution, and are often tasked in the laborious chore of collecting fuel. These burdens can cause serious impact on their health and security. This section outlines key trends in the energy–women–children–health nexus in Asia and the Pacific.

Labor and Health Burden of Traditional Energy Services

The burden of the energy access gap falls heaviest on women. High dependence on solid fuels for cooking and heating disproportionately affects women and children and their health through indoor air pollution, the drudgery of firewood collection, and reduced time and opportunities for gainful employment and leisure.

The adverse effects of indoor air pollution resulting from the use of solid fuels are well established. According to the WHO, out of the 4.3 million deaths worldwide attributed to indoor air pollution in 2012, 80% were in Asia and the Pacific,[12] and almost 10% of the mortality in low- and middle-income countries can be attributed to such pollution.[13] Recent projections for 2030 show that indoor air pollution will cause more premature deaths than HIV and malaria combined (IEA and OECD 2011). Women, by virtue of their central role in food preparation for the household, are more vulnerable and more likely to fall ill from indoor exposure to air pollutants. Children, who often assist their mothers in their household role, also bear some of the disease burden.

The use of solid fuels has other costs as well. Having to gather cooking fuel, and spending a huge amount of time and effort on the task, deprives women and children of the chance to rest, get an education, or engage in entrepreneurial ventures that could increase the family's income and purchasing power. The Self-Employed Women's Association in India reported recently that women in rural Gujarat spend up to 40% of their waking time collecting fuel or cooking (World LP Gas Association 2014). Low energy supply compounds the problem. With little or no electricity, domestic chores become even more tedious and time consuming. Traditional sources of energy for lighting, like candles and kerosene, make inroads into the meager family budget, displacing education, investments, or savings in anticipation of harder times.

Transforming Women's and Children's Lives through Modern Energy

Access to energy can transform women's lives by reducing indoor air pollution caused by the use of solid fuels for cooking and heating, by relieving the tedium of daily chores, and by creating new opportunities for income generation and improving existing opportunities.

Women spend at least twice as much time as men on domestic work, and they work longer hours than men do, when all work—paid or unpaid—is considered (UNDESA 2010; Duflo 2012). Releasing time for education and for economic, political, and social opportunities is a necessary first step (World Bank 2012).

Improved cooking devices save time that would otherwise be spent collecting fuelwood. The cooking time saved can be even greater—up to an hour and a half per day, versus about 15 minutes of saving in fuel-gathering time, as studies from India suggest (World LP Gas Association 2014). Surveys among users of household biodigesters of national programs supported by SNV Netherlands Development Organisation in eight countries in Asia uniformly report on the great satisfaction expressed by women with the instant cooking aspects allowed by biogas.[14] Biogas is smokeless and does not require constant attention or blowing on the coals, making cooking easier, and saving the time and labor otherwise spent on the collection of traditional cooking fuels. Women can put a pot on the burner and do other

[12] Asia and the Pacific estimates include only the developing members of ADB.

[13] From the WHO data summary on mortality from indoor air pollution. http://www.who.int/gho/phe/indoor_air_pollution/burden_text/en/

[14] These surveys can be accessed at SNV Netherland's library: http://www.snvworld.org/en/regions/world/publications?filter=renewable-energy/f.monitoring-evaluation

activities while the food is cooked. This provides opportunities for women to embark on other activities varying from earning additional income to extending childcare. However, progress in the adoption of cleaner cooking solutions, both globally and in Asia and the Pacific, has been slow (Box 3.1).

Box 3.1. Attention to Clean Cooking Must Be Stepped Up

In 2010, clean cooking solutions covered less than 30% of population in South Asia; 41% in Southeast Asia and 51% in East Asia. Among solid fuel users, improved biomass cookstoves cover 11% in South Asia, 21% in Southeast Asia and 85% users in East Asia. Recent research also shows that the available range of improved cookstoves can mitigate these harmful effects to some extent only and that it is only the cleanest cooking solutions that can truly bring about transformational health and environmental outcomes (ESMAP 2015).

In 2014, more than 140 countries had renewable energy targets and support policies in place, but almost all of these were for the power sector. And according to the 2015 report of the Global Tracking Framework, while there have been notable advances in electrification, by contrast, access to clean cooking continues to fall behind. From 2010 to 2012, there was negligible overall progress, with annual growth in access to nonsolid fuels falling by 0.1%, well short of the 1.7% target growth rate required to reach universal access by 2030.

Sources: World Bank ESMAP and IEA (2015b) and ESMAP (2015).

Access to energy also enables households to pump water for drinking, instead of relying on burdensome and time-consuming water collection by the women of the household from distant, often polluted, sources. In addition, informal or home-based enterprises like mini grocery stores and small food kiosks, which are typically owned or operated by women, can stay open longer and sell more, because of better access to energy.

Lighting offers other significant benefits, many of them especially relevant to women. Research in Bangladesh, India, Indonesia, and Sri Lanka has shown that improved and more reliable lighting gives women greater flexibility and helps them organize their work better (Barkat et al. 2002; Laksono and Subagya 2003; Barnes and Sen 2004). In electrified households, women's literacy rates are more than 20% higher, according to the Bangladesh study (Barkat et al. 2002). Women also tend to read more, the World Bank–administered Energy Sector Management Assistance Program (ESMAP) report stated, after a survey in India (Barnes and Sen 2004).

The benefits extend beyond the household. Health and education facilities with electricity are better equipped to provide effective services. Schools are well placed to support improvements in literacy and educational attainment (Box 3.2). Hospitals and clinics can attend to regular health needs and also make lifesaving interventions, even at night. At present, one billion people worldwide are served by health facilities with no electricity. In India, 46% of the health facilities, serving an estimated 580 million people, are without electricity (Practical Action 2014b).

Amid these issues, innovations made under many projects across the region have helped increase the positive impact of sustainable energy on the lives of women and children. Three such projects were highlighted during the SE4All consultation workshop organized in Manila on 14 June 2015 (Box 3.3).

Box 3.2: Children and Access to Clean Energy

A recent report from the United Nations Children's Fund (UNICEF 2015) highlights major opportunities to improve the health, education, well-being, and development of children, with the help of sustainable energy solutions.

- In nearly all regions of the world, girls and women are responsible for collecting cooking fuel, typically fuelwood. Fuelwood collection presents a major physical and time burden, and often puts girls at great risk of sexual assault and physical injury. Reducing the need for fuelwood collection can make a difference.
- Children are among the worst affected by indoor air pollution. Almost 50% of pneumonia deaths among children under 5 years are found to be due to particulate matter inhaled from indoor air pollution (WHO 2011, cited in UNICEF 2015).
- Kerosene lighting reduces children's study hours and exposes them to serious fire hazards and distinct health issues. Good-quality lighting can reverse this situation. Research in Bhutan has shown that children in electrified households enjoy 274 more days of schooling than those living in households without access to electricity (Kumar and Rauniyar 2011).
- More than 50% of children in the developing world go to primary schools that have no access to electricity (Practical Action 2013). Only 48% of primary schools in South Asia, with a total of 94 million students, have access to electricity. Energy enables schools to provide good-quality lighting and other applications, such as computers and the internet, as well as clean drinking water. Lighting also has a positive effect on school attendance and teacher retention.

Source: UNICEF (2015).

Box 3.3: Innovative Sustainable Energy Solutions that Benefit Women and Children

SELCO with its partner, Mahesh Foundation, helped establish an Integrated Energy Centre (IEC) in June 2013 to cater to the basic energy needs of the community at Kanbargi slum in Belgavi, Karnataka. The community of more than 200 extremely vulnerable families had poor access to basic services like health, sanitation and education. The absence of grid connection in the area forced households to use kerosene for lighting. This proved costly and also detrimental to health for community members. The IEC acted as an entry point in improving living conditions in a slum and opened opportunities for the community to access other basic services. The initiative brought provision of basic lighting services, a weekly health center and a space to hold literacy programs to the slum. A local financial institution was brought in to introduce an account opening drive and a sensitization program was conducted for livelihood and self-employment training for unemployed youth and women. The women and children of the community have benefitted greatly mainly from better lighting for studying, health checks, and savings in bank accounts.

GIZ, through its Sustainable Energy for Development Programme in Bangladesh, is assisting small rice mills to improve their rice parboiling system. Traditionally, these mills use rice husk to fuel inefficient, unsafe and polluting boilers. This creates an unhealthy environment for workers and neighbors, many of whom are women and children. GIZ has helped the development of locally customized technological solutions, cluster-based service providers, and capacity building for the operation and management of rice mills. It also supports building capacity of banks to finance these technologies. The intervention will improve efficiency and life of the boilers and increase their productivity, making them more financially viable. In Bangladesh, it is estimated that there are half a million female rice mill workers and most of them have children living with them. They all can potentially benefit from better and heathier working environment, contributing significantly to better health and living conditions.

continued on next page

Box 3.3 *continued*

Sunfarmer—a nonprofit organization that installs solar energy in hospitals, health clinics, and schools in the developing world—installed a solar energy system for Lungra Health Clinic in Achham district of Nepal. The health clinic delivers about 100 babies each year. Without electricity for adequate lighting and to power life-saving equipment, many women do not survive childbirth. With no electricity, babies were delivered at night by midwives holding flashlights between their teeth. In case of complications, mothers were lifted onto stretchers for the 4-hour hike to the nearest hospital with electricity. With solar electricity, babies are now born under solar lights in the clinic, and modern medical equipment will soon be on the way to save the precious lives of more mothers and newborn. Sunfarmer is working to find innovative ways to make the solar electricity installation reliable, affordable and durable. A doctor at the Bayalpata hospital said it all when he said "solar electricity makes possible what many think is impossible—delivering high-quality healthcare to patients in isolated rural communities." Many such patients are women and children.

Sources: presentations of Huda Jaffer, SELCO Foundation; Al Mudabbir Bin Anam and Jan Söhlemann, GIZ-Bangladesh; and Marco Indelicato, Sunfarmer during the SE4All consultation workshop on 14 June 2015.

Integrating Women into the Energy Supply Chain

Women are increasingly playing a central role in the promotion, sale, servicing, and financing of household energy devices. As end users, they know more about everyday cooking needs and are in a position to drive demand and catalyze more consistent and sustained adoption and use. Their input contributes greatly to the design and manufacture of cookstoves that are more appropriate for the target market. Women can leverage their networks to promote the adoption of new technologies and use their firsthand experience to market clean energy solutions effectively. They can serve as spokespersons for the use of clean energy, endorsing marketing messages and taking advantage of women-to-women communication strategies. A number of energy enterprises have employed women to reach energy markets in this segment (Box 3.4).

ENERGIA's Women's Economic Empowerment program (2014–2017) is currently scaling up proven business models that will strengthen the capacity of 3,000 women-led micro and small enterprises to deliver energy products and services to more than 2 million consumers. The Women's Empowerment Fund of the Global Alliance for Clean Cookstoves is another grant facility designed to scale up effective business models and approaches to empowering women energy entrepreneurs in the clean cooking sector.

Box 3.4: Women in the Energy Supply Chain

- **Improved cookstoves (Cambodia).** In Cambodia, over 3 million improved cookstoves have been sold since 2003. The Group for the Environment, Renewable Energy and Solidarity (GERES), a nongovernment organization, has used women's traditional skills in pottery while training local women in quality control and enterprise development to produce and disseminate over 450,000 improved cookstoves. About 8,000 Neang Kongrey Stoves (NKSs)—efficient rural cookstoves—built by women are disseminated each month.
- **Wonder Women (Indonesia).** The Wonder Women initiative of Kopernik, a nongovernment organization, empowers women to sell a range of energy and water technologies in their villages, boosting their income and expanding energy access. The women receive business training, technologies on consignment, and a starter kit of sales and marketing material. More than 300 women have sold clean energy technologies to 50,000 people.
- **Sakhi Unique Rural Enterprise (India).** SURE brings rural women into the supply chain to market clean energy products to low-income, last-mile consumers. It helps to design culturally appropriate products that reflect the needs of the users, and directly connects the women entrepreneurs to public and private institutions that can provide them with the funding and technical assistance they need. SURE emphasizes customer service and works closely with the women entrepreneurs to provide high-quality after-sales service.
- **Village Education Resource Center (Bangladesh).** This nongovernment organization works with women entrepreneurs to distribute improved cookstoves in Bangladesh. Its activities are focused on building the capacity of the organizations in the network and community members, and popularizing the technology through information and education campaigns.
- **Negros Women for Tomorrow Foundation (Philippines).** This microfinance institution has expanded to energy lending, partnering with product suppliers to distribute energy products such as solar home systems and improved cookstoves. Through the program, women can become business partners (retailers) or direct users of the products.

Source: Presentations of Corinne Hart, Global Alliance for Clean Cookstoves; Sally Bolton, Kopernik Indonesia; and Manuel Margate, Negros Women for Tomorrow Foundation during the SE4All consultation workshop on 14 June 2015.

Policy Directions

Given the multiplier effect of addressing gender-related issues, government policies that help support gender mainstreaming could push the sustainable energy agenda forward. Policies and regulatory frameworks are crucial in encouraging women to participate in the planning, financing, implementation, and monitoring of energy projects, especially those that are privately led (Box 3.5). These policies and rules should pave the way for a more inclusive partnership among all stakeholders, including the private sector, to ensure effectiveness and sustainability.

To scale up these approaches and improve outcomes concerning women and chiildren, four policy areas need to be strengthened:

- Recognition of women's specific energy needs (for example, water pumping, agricultural processing) and prioritization of these needs in energy sector interventions through targeted subsidies and improved access to energy supply, technologies, and appliances;

- Support for women entrepreneurs, through technical assistance and financing, to enable them to sell, service, and finance energy products;
- Enhanced commitment to and investments in clean cooking, especially for the poor; and
- Investment in energy access for social infrastructure that directly affects women and children—such as health clinics and schools—and ensure that planned interventions are designed with a gender lens to enhance the benefits.

Box 3.5: Policies and Strategies that Support Gender Equality

- The Government of Nepal launched the Clean Cooking Solutions for All by 2017 program to lower indoor air pollution in households. It also adopted the Renewable Energy Subsidy Policy of 2013, which has specific subsidies targeted at women and socially excluded groups, at both the household and community levels, for solar thermal, biogas, and metallic cookstoves. The governance structure for the disbursement includes gender and social unit representation in the technical review committee and in user committees.
- To realize the government's ambitious goal of 90% national coverage of all households by 2020, a well-targeted financial support instrument was pilot-tested in the Lao People's Democratic Republic in 2008. The Power to the Poor (P2P) program was designed to support the poorest households with a gender focus, to bring the benefits of access to electricity to the poor. It provided interest-free credit to qualified households for the payment of up-front connection charges in installments. All female-headed and single-parent households were automatically eligible for support, as long as an electricity connection could be safely installed in their houses. Furthermore, the consultative process was made gender inclusive, and gender-sensitive communication materials were used.
- The Asian Development Bank (ADB) provided support to the Government of Papua New Guinea to improve power supply in provincial urban centers through the Town Electrification Investment Program. This program mandates 30% female participation in community consultations, skills training for village committees and households (at least 50% women), 50% female participation in village power and water committees, jobs for women in project construction and ongoing maintenance, equal pay for equal work, an HIV/AIDS awareness campaign, and gender awareness and capacity-building training for the energy utility.
- The Government of Viet Nam entered into a partnership with ADB to expand electrification to remote mountainous communities through the Renewable Energy Development and Network Expansion and Rehabilitation for Remote Communes Sector Project. The project is specifically aimed at providing 75% of women-headed households with electricity by 2016 through measures such as subsidized grid connection to poor and ethnic minority households and women-headed households; representation of women in community management boards; and mobilization of women's groups for campaigns to raise awareness of the safe use of electricity.
- The utility agency UzbekEnergo in Uzbekistan, through the ADB-supported Advanced Electricity Metering Project, implemented a strategy that combined gender-sensitive institutional capacity building with opportunities for women to participate in customer service functions and education activities for users. Key features of the project included establishing gender focal points and a gender-disaggregated database for human resource management and development; training women to conduct awareness-raising campaigns; and ensuring that women made up at least 50% of the staff at district service centers.

Sources: ADB (2012); presentation of Laspho Litthanalouk, Ministry of Energy and Mines, Department of Energy Policy and Planning, Government of Lao People's Democratic Republic; and presentation of Lachana Shresthacharya, Centre for Rural Technology, Nepal during the SE4All consultation workshop on 14 June 2015.

SUSTAINABLE ENERGY FOR ALL (SE4All) INITIATIVE

Partnership towards achieving the SE4All Targets

MAKING A DIFFERENCE

Vision
Providing clear, concise global vision and objectives that support action across SE4All targets

Global Partnership
Leveraging the convening power of the United Nations and the World Bank

Network of leaders
Bringing together governments, businesses and civil society

Innovative Solutions
Mobilizing stakeholders to support innovative solutions

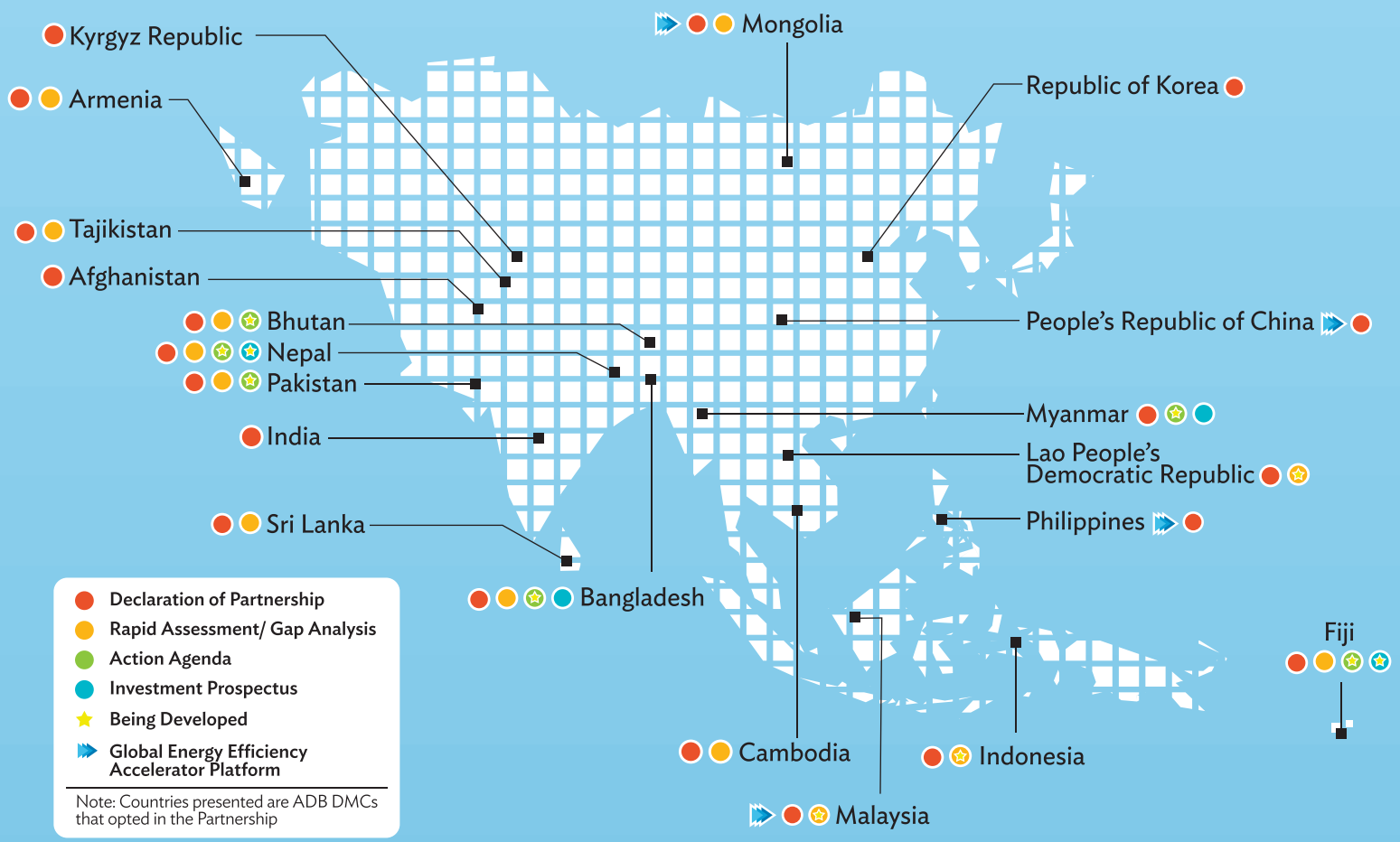
Investments
Creating conditions for scale-up of investments in sustainable energy

Accountability
Tracking progress with transparency and accountability

COUNTRY ACTION PROCESSES

1. Declaration of Partnership
2. Rapid Assessment/ Gap Analysis
3. Country Action Agenda
4. Investment Prospectus

SE4ALL PARTNER COUNTRIES AND THEIR INITIATIVES



Sources: Country communications, ADB, UNDP, ESCAP, SE4All Global Facilitation Team, and World Bank

4 The SE4All Partnership

Country Action Processes and Initiatives

Concrete actions must be taken at the national level to achieve the three SE4All objectives. For this reason, a steadily increasing number of governments are implementing integrated country actions that will strategically transform their energy systems as part of the SE4All initiative.

The SE4All Global Action Agenda has clearly highlighted the need for leadership from and interconnectedness among the three important stakeholders to achieve the SE4All objectives—the government, to design and implement transformative country actions through policies and an enabling environment; the private sector, to provide solutions and serve as primary driver of investment; and civil society, to effect and sustain change. Much emphasis is therefore placed on setting up an effective national SE4All coordination structure or mechanism. Such a coordination mechanism, as in the case of Nepal (Box 4), will create a multi-stakeholder platform, resulting in a new pattern of partnership that will help in the coordinated implementation of joint actions, fund mobilization, reduced duplication of work, and optimal use of available resources in a meaningful way.

Box 4: Setting Up a Comprehensive SE4All Coordination Mechanism in Nepal

A number of coordination mechanisms already existed in the energy sector of Nepal. Formal mechanisms were functional in the case of off-grid and energy efficiency thematic areas, while an informal mechanism was in place for the on-grid subsector. But it was felt that all these mechanisms needed improvements in their composition and functions to align more fully with the SE4All objectives.

Following the decision of the Government of Nepal to join the SE4All initiative in June 2012, the National Planning Commission (NPC) of Nepal was designated as the focal agency. A national mechanism headed by the NPC vice-chair and the secretaries of seven ministries was set up to provide strategic guidance to the SE4All process and ensure interministerial coordination. However, neither the private sector nor civil society was represented in this high-level national mechanism. Such representation was needed to engage these stakeholders in discussions and decision making, and to ensure national ownership of the decisions taken, to ease implementation later on.

A revised, two-tiered mechanism for SE4All coordination that addressed these deficiencies was adopted in August 2013. At the apex (national mechanism), there is high-level representation from the government, the private sector, civil society, and development partners. The second tier consists of three coordination groups based on thematic niches. Each of these groups is primarily responsible for the achievement of one of the three SE4All targets for Nepal. These groups are based on existing coordination groups, especially in the on-grid and off-grid subsectors, but have adequate representation from the main stakeholders and development partners. The coordination groups are headed by the secretary of the Ministry of Science Technology and Environment (for energy access), the secretary of the Ministry of Energy and Water (for renewable energy), and the secretary of the Energy Commission Secretariat (for energy efficiency coordination). The three groups are linked to the seven action areas, as outlined below:

continued on next page

SE4All Coordination Groups	SE4All Action Areas
Universal energy access (off-grid)	• Modern cooking appliances and fuels • Distributed generation
Hydropower and large-scale renewable energy (on-grid)	• Large-scale renewable power • Grid infrastructure and supply efficiency
Energy efficiency	• Industrial and agricultural processes • Transportation • Building and appliances

The SE4All coordination mechanism is operational. It will also serve the requirements of other initiatives that supplement or complement the efforts of SE4All. The national mechanism and the coordination groups have been meeting to find suitable ways to monitor progress in Nepal on SE4All objectives and intervene as required to ensure that Nepal realizes national projects aligned with the 3 objectives of SE4All. The challenge now is to make these various committees meet regularly, take complete ownership of the SE4All process, and closely monitor and evaluate Nepal's performance in meeting the SE4All objectives. In the longer term, the possibility of turning the SE4All high-level coordination mechanism into a permanent government institution can also be looked into.

Source: Basnet, Suman (2013).

Global Energy Efficiency Accelerator Platform

To double the global rate of improvement in energy efficiency by 2030, the SE4All has launched the platform, which supports energy policies for cities, regions, and countries around the world to accelerate existing initiatives through public–private partnerships. The platform is now composed of SE4All global energy efficiency accelerators for six sectors—appliances, buildings, district energy, industry, lighting, and transportation. All cities, regions, and countries in the region and worldwide are invited to join the platform.[15]

Policy Interventions of Partner Countries

The developing member countries (DMCs) surveyed in Asia and the Pacific region have shown progress in increasing energy access, energy efficiency, and the adoption of renewable energy in the last 5 years, in view of the significant increase in supporting policy measures and programs. Although they are at various stages of policy development, the general trend is the establishment of targets in each area, followed by the continued introduction and expansion of plans and measures for meeting those targets.

Access. Regarding energy access in Asia and the Pacific, electrification policies, plans, and strategies have generally been put in place in the DMCs, though they are only being established in some less developed countries (such as Cambodia, Fiji, and Myanmar). Policies centered on grid upgrades and extensions, as well as on distributed energy through household systems and, increasingly, mini and micro grids, are extending access to millions.

For many developing countries, investments in rural electrification exceed government budgets and therefore remain problematic. A clear policy shift toward attracting private sector interest in such

[15] SE4All (2015) and http://www.se4all.org/energyefficiencyplatform/

difficult areas of investment is therefore seen. Rural electrification is often paired with the promotion of renewables-based mini- and microgrid systems, and current policies in the region place particular emphasis on the use of solar and hydro resources. Additionally, household- and community-level investments in grid connections or household systems are increasingly encouraged through government financing schemes (such as micro loans for connection costs under the Power to the Poor program in the Lao People's Democratic Republic, an approach that has been replicated in Cambodia through the Program for the Development of Rural Electrification).

The diverse needs of populations across the region have given rise to innovative electrification approaches. In Mongolia, for example, nomadic populations have been reached with household solar photovoltaic and wind energy systems. Bhutan promotes the direct sale of home solar lantern lighting systems through women entrepreneurs. Policies supporting the use of improved cookstoves and, more recently, household biogas from agricultural waste are seen in many countries.

But the effective implementation of energy access policies and programs is far from being a given. Basing targets on political factors—without giving enough consideration to what can be realistically achieved in view of the status of planning, finances, and implementation capacity—has resulted in missed targets. Responsibility for rural electrification can span several ministries, which may not coordinate effectively, so that objectives are misaligned, and targets and approaches differ.

Although governments are encouraging private sector involvement in rural electrification, economic feasibility still presents a problem in many areas. Various models are being pilot-tested across the region with this in mind. The increasing involvement of the private sector is introducing intricacy in the regulation of numerous technologies and approaches to rural electrification; in many cases, the private sector has limited capacity to take on the complexities of rural electrification in a sustainable manner. A logical next step for policy development would be setting national standards and guidelines for designing distributed energy systems, to allow operation and maintenance to be done on a larger scale, beyond the confines of the village, and planning for eventual grid integration.

In countries with some of the lowest electrification rates, external funding and support is advancing access objectives. The Energy for Rural Development in Afghanistan program, supported by the UNDP, has pilot-tested and developed guidelines for renewable energy projects, and provided input to the draft Afghanistan National Development Strategy and micro hydropower development policy. With help from the SE4All Partnership and in collaboration with the World Bank, Myanmar is drafting its National Electrification Plan for moving the country from less than 30% electrification of households to universal access to electricity by 2030.

Several developing countries are already looking beyond expanding power grids to increasing power quality and affordability. The PRC's 12th Five-Year Plan, for example, emphasizes not only increased access but also power supply reliability and cost parity between rural and urban populations, to help close access gaps.

Efficiency. A large number of policies and measures that emphasize efficiency improvements across economic sectors have been introduced throughout Asia and the Pacific in recent years. Many countries have decreased their energy intensity as they have reduced their power generation, transmission, and distribution losses, and established or improved efficiency standards for industry, transport, and buildings. Financial incentives, auditing, labeling, and other instruments are being adopted, energy service companies are becoming more prevalent, and public awareness efforts are contributing to increasing efficiency from the sectoral to the household level.

Several countries have set ambitious energy efficiency targets. The Republic of Korea's energy efficiency target of a 46% improvement by 2030 over the 2007 base year is equivalent to an annual improvement of 2%, on average.[16] Tajikistan is looking forward to significant energy efficiency improvements in key sectors and areas by 2016, compared with the 2011 levels, including a 20% improvement in industrial processes, 20% in public utilities and electric transportation systems, 25% in water pump stations, and 10% in agriculture.[17]

The PRC's approach to increasing energy efficiency across sectors is among the most aggressive. The power sector has been undergoing continuous infrastructure upgrades to reduce losses, and though the country continues to rely primarily on coal for power generation, new policies promote reduced coal consumption in thermal plants. Limits are being placed on energy consumption in industries and on industrial expansion. Industrial power consumption is still rising rapidly, but demand-side management measures, including standards, monitoring, and mandatory compliance, are being implemented. Measures aimed at increasing efficiency in the transport sector include expanding public transportation systems, improving fuel economy standards, and promoting the use of electric vehicles. Funds are being directed to the development of energy efficiency technologies through preferential taxation and other measures. The development of low-carbon and "green" eco-cities embraces a comprehensive urban planning approach to limiting energy consumption. Public awareness through labeling and advertising campaigns is a key component of the push for efficiency among households, and the country is striving for a societal shift toward greater ecological consciousness.[18]

India has established energy consumption targets across eight energy-intensive sectors (aluminum, cement, iron and steel, chlor alkali, thermal power plants, fertilizer, pulp and paper, and textiles), and issues energy savings certificates to industrial units that exceed their targets. These certificates can be traded to other units, for use in avoiding financial penalties for noncompliance.[19] In addition, India has specifically targeted small and medium enterprises that may lack awareness and capacity to implement energy efficiency measures. An energy efficiency labeling campaign directed at consumers is also being carried out.

Despite the many positive examples of progress in energy efficiency, however, national development contexts continue to present various difficulties. Many less developed countries and low-income economies are still in the initial stages of energy efficiency policy development and have yet to introduce comprehensive measures. For some of them, economic development goals prevent aggressive efficiency targets, though economic development is gradually being decoupled from energy demand growth (such as in Sri Lanka's National Energy Management Plan, 2012–2016). Even if such targets are set, estimating the actual outcomes of energy efficiency programs is not easy. Enforcing and monitoring compliance with national regulations adds significant costs, and the uptake of energy efficiency investment and measures can be limited in the absence of short payback periods or financial incentives. Furthermore, a lack of information and data about energy consumption and energy-saving opportunities hinders the development of effective policy measures. Significant capacity-building efforts from the government to the consumer level are needed.

Renewables. The drive to increase the supply of renewable energy enjoys broad support across the region, as governments tend to view renewable energy as a means of strengthening energy security and

16 The National Energy Basic Plan (2008–2030).
17 Program for the Efficient Use of Hydropower Resources and Energy Saving, 2012–2016.
18 Energy Development Strategy Action Plan (2014–2020) of the People's Republic of China.
19 Sarma, Bhaskar. 2014. Energy Efficiency in India—Challenges & Lessons. A presentation for the In-session Technical Expert Meeting on Energy Efficiency in the Durban Platform for Enhanced Action. Bonn, Germany. 13 March 2014. https://unfccc.int/files/bodies/awg/application/pdf/2_india_revised.pdf

reliability from the national to the household level, supporting the electrification of areas not reached by national grids, and reducing environmental impact. Differences in resource availability shape national policy directions. But renewable energy targets and support measures, in various forms, are widely in place.

Many renewable energy policies in the region are directed at households and communities, and support the provision of solar home systems, the introduction of renewables-based micro and mini grids, and the production of biogas to meet basic household energy needs. As financial and technical barriers are lowered, however, countries are also increasingly introducing renewables on a larger scale, through grid-integrated solar and wind farms, large and small hydro, biomass, and geothermal power plants.

The PRC has largely defined the group trend in renewable power capacity installations and investment, with its highly comprehensive policy framework that supports the entire value chain of renewable energy—from research and development to technology commercialization, energy production, and power system and market integration. India, Pakistan, Indonesia, and the Philippines have also made significant capacity additions in recent years, as a result of the rapid increase in regulatory policies, financial incentives, and public financing, for both centralized and distributed renewable energy technologies.

Across the region, investor confidence is increasing. The falling cost of renewables means that unsubsidized renewables, such as photovoltaic power, are becoming cost competitive with fossil fuels in some countries, especially if granted priority grid access. Markets for the various resources vary, and the technical feasibility of integrating variable renewables, such as solar and wind, into the grid is still a concern. But as these concerns are being gradually addressed through greater public awareness, capacity development, and more advanced grid management systems, the barrier to renewable energy integration in many areas and for many potential power producers is increasingly becoming a financial, rather than a technical, one. This is where predictable and favorable policy regulations and financial mechanisms, such as feed-in tariffs, tax incentives, and public investments, have a major role to play in driving national renewable energy development by creating an investor-friendly environment.

The investment climate remains challenging for countries without well-established and predictable policy frameworks. Although legislative measures have rapidly broadened in recent years, particularly in less developed countries, barriers persist. In some countries, political instability limits investor confidence. In others, a meager informational database on renewable energy potential and feasibility assessments for deploying renewable energy technologies make informed policy and investment decisions difficult. In addition, the significant up-front administrative commitments and costs involved in feed-in tariffs and financial incentives complicate their implementation in less developed states.

Subsidies for conventional fuels are still high, hindering price competitiveness and investment in renewables. However, fiscal reforms—as in the case of Indonesia, which has capitalized on low oil prices and redirected subsidies toward developing infrastructure and alternative energies—show potential for equalizing the playing field between conventional and renewable energy. To address the significant barrier presented by limited access to finance, more financial instruments must be introduced on both the supply and demand side of renewable energy systems, to support both developers and consumers.

Finally, it is important to recognize the human and institutional capacity aspects of renewable energy uptake, and the progress needed in this area. Policies across the region emphasize this aspect and effective implementation is required at local, community, and national institutional levels.

Table 4 on the next page summarizes the main findings of this report regarding the progress made by the various Asia and the Pacific countries toward the SE4All objectives.

Table 4: Progress Made in Asia and the Pacific Toward the SE4All Objectives

COUNTRY	ACCESS			EFFICIENCY							
	Electrification targets	Service quality objectives	Clean cooking solutions promotion	Efficiency Targets	Industry Standards	Transport Standards	Buildings Standards	Lighting and Appliances Standards	Financial Incentives	ESCOs	Labeling
Afghanistan	o		•								
Armenia	n/a		•				•	•	•	•	•
Bangladesh	•		•	•	•			•	•	•	•
Bhutan	•		•		•		•		•		•
Cambodia	•		•	•	*		*	*	*	*	*
People's Republic of China	•	•	•	•	•	•	•	•	•	•	•
Fiji	o	x	o	x,o	•	o	•	•	•	•	•
India	x		•	•	•	•	•	•	•	•	•
Indonesia	•			•	•	•	•	•			•
Kyrgyz Republic	•	•		•			*				
Lao PDR	•		•					*			*
Malaysia	•	•		o	*		•	o	o	•	o
Mongolia	•										
Myanmar		*									
Nepal	•		•						•		
Pakistan							*		•	•	*
Philippines	•	•		•		•		•	•		
Republic of Korea	n/a	•	n/a	•	•	•	•	•	•	•	•
Sri Lanka	•		•	•	•		*		•	•	
Tajikistan	•	•		•							

LEGEND: o = draft, ● = current, x = expired, * = planned

ESCO = energy service company, Lao PDR = Lao People's Democratic Republic, n/a = not applicable, RE = renewable energy, REC = Renewable Energy Credit.

Source: ESCAP Asia Pacific Energy Portal (2015).

	RENEWABLES											
	Public Awareness	Renewable energy targets	Feed-in Tariffs	Renewable Energy Portfolio Standards	Net Metering	Biofuels obligation/ mandate	RE heat obligation/ mandate	Tradeable REC	Competitive bidding/ tendering	Capital subsidy, grant or rebate	Tax incen-tives	Energy production payment	Public investment, loans or grants
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Challenges and the Way Forward

The Asia and the Pacific region has made significant progress in its commitments toward the achievement of the SE4All objectives in the region. However, much work remains to be done. Countries are in different stages of implementation: some have already completed their Rapid Assessment and Gap Analyses, and are developing their Country Action Agendas and Investment Prospectuses, while others have yet to start implementation. In this regard, the gaps and challenges that persist in the region—specifically in implementation, capacity building and training, coordination, and support—are worth noting.

A number of countries have identified capacity-building needs, with particular focus on the technical training of energy experts and industries, data gathering and presentation, and benchmarking and tracking of the targets, among others.

The important role of local communities—specifically in training and building the capacity of local entrepreneurs to comply with government requirements and procedures, and to be self-sufficient and self-reliant in maintaining their renewable energy systems—should also be highlighted. Capacity building in communication and advocacy is likewise needed, to enable communities to take up issues with policy makers and influence policy (bottom–up policy making). South–South cooperation can prove beneficial as well in sharing capacity, by transferring technologies from one country to another to help scale up SE4All activities at the community level.

The importance of engaging civil society organizations in these efforts to encourage good governance must be further highlighted. These organizations' role in awareness raising and monitoring is crucial. In many countries in the region, energy policies do exist but cannot be fully implemented and enforced for various reasons. If policies are properly implemented and enforced, gaps will be identified, worked on, and improved.

The involvement of the private sector—not only large-scale infrastructure and businesses but also small-scale local enterprises—must also be emphasized. The value addition of initiatives like the SE4All must be clearly stated and highlighted to this group, for effective private sector engagement. Incentives and protection for small-scale enterprises must be included and taken into account in policy formulation.

Intragovernmental coordination mechanisms must be identified and strengthened. Government institutions must have a proper feedback mechanism so they can decide how they can tackle energy issues and come closer to achieving the SE4All objectives in their respective countries. Institutional capacity should also be strengthened through further institutional development and reform to create an enabling environment for investments.

Clearly, support for a long-term approach to capacity building and training is much needed and should be considered a high priority. Most countries do not have enough resources to provide such support. And while support is available from development partners and organizations, the problem of how to prioritize the distribution of such resources remains.

These are only a few of the challenges that must be addressed to achieve SE4All targets in the region. More importantly, with the inclusion of energy as a stand-alone SDG—consistent with SE4All's energy

access, energy efficiency, and renewable energy objectives—a holistic and more integrated approach to the implementation of the SE4All objectives in the region must be taken and countries must adopt and integrate this agenda into their national targets and policies.

Commitments and Partnerships

Most recent estimates show that global annual investments have to increase by $650 billion over the current $350 billion. For energy access, annual spending must increase by $49.4 billion over the current level of $9 billion. For renewable energy, $442–$650 billion will be needed each year from the current baseline of $258 billion to reach the 2030 objective. By far the largest funding gap is in developing Asia. Finally, for energy efficiency, annual spending will have to increase from the current $130 billion to $560 billion by 2030 (SE4All 2015).

The energy needs of Asia and the Pacific are expected to double by 2030, presenting major supply and energy security challenges. Continued reliance on fossil fuels will heighten the threat to energy security and the impact of climate change, thus affecting millions of the region's poor through an increase in natural disasters and food and water shortages.

The need for clean energy across the region is greater than ever. Countries must transform themselves into low-carbon economies to enhance energy security while mitigating climate change risks.

In this regard, increasing access to energy and promoting renewable energy and energy efficiency should be the top priority. Significant funds are available, but these must be properly channeled into proper investments and bankable projects. Enabling environments for investment must improve, project preparation must be pursued more diligently, and alternative finance mechanisms must be established. To meet the SE4All targets, certain conditions will need to be in place (SE4All 2015):

- Countries need to be ready and able to absorb large amounts of capital by increasing implementation capacity and putting enabling investment environments in place
- A qualified pipeline of deals for capital must be effectively deployed, building upon long-term policies
- Capital with a suitable risk appetite must be available and ready for deployment, given the nature of the investment opportunities.

Sustainable energy infrastructure projects also require an environment that enables investments built on macro and micro stability. An enabling investment environment is typically characterized by peace and stability, the rule of law, good governance with accountability and transparency, the absence of corruption, adequate infrastructure, an educated workforce, clear property rights, enforceable contracts, and no retrospective changes to regulation (SE4All 2015).

In addition, four broad investment areas with the potential to scale up finance for sustainable energy have been identified by the SE4All finance committee:

- **Green bond market development:** identifying strategies for market growth and high-impact investments.

- **Structures that use the de-risking instruments of development finance institutions (DFIs) to mobilize private capital:** catalyzing co-lending opportunities in developing countries and increasing capacity for more DFI and commercial bank lending by helping to free up current capital and the balance sheet, including aggregating portfolios of projects across regions or countries.
- **Insurance products that focus on removing specific risks:** highlighting private sector initiatives and opportunities for new public sector engagement and coordination.
- **Aggregation structures that bundle and pool small-scale project opportunities:** addressing both scale and capacity issues in developing countries.

Establishing an enabling environment at the country level—including supporting policies, regulations, and a strengthened utilities sector—and boosting investments in project preparation to convert concepts into investable deals are no less important.

Existing Commitments and Partnerships

ADB, ESCAP and UNDP, other development partners, and governments have been actively helping countries to achieve the goal of sustainable energy for all in the region. The assistance from these partners specific to the country action processes and to other sustainable energy programs and initiatives in the region has been significant.

ADB's success, through its Energy for All Project Development Facility, in facilitating investments in energy access by offering a customized suite of services that cater to the needs of entrepreneurs, private equity funds, commercial banks and other private sector players has proved to be an effective catalyst for engagement and action. To date, more than 120 social enterprises working on energy access in 13 countries were identified, of which 70 received business development support from ADB. The PDF has already marketed 34 companies to investors, provided customized mentoring to 5 business enterprises and facilitated 11 deal closures since it was established. Under SE4All, this PDF will be expanded to extend this suite of services to the renewable energy and energy efficiency sectors. ADB has also formed a partnership with IRENA and is supporting SEAS in the creation and operation of the Sustainable Energy Center of Excellence (SECOE) based in Singapore. ADB is also collaborating closely with the SE4All Global Energy Efficiency Accelerator Platform.

ESCAP has developed an intergovernmental dialogue on common infrastructure and harmonized energy policies—the Asian Energy Highway—as a key area of action, to intensify regional economic integration. Furthermore, an online energy portal was launched by ESCAP, the Asia Pacific Energy Portal,[20] to provide unprecedented access to information on the energy policies of the countries in the region. The portal provides interactive data visualizations that enable rapid trends identification as well as policy tracking and search. The unique combination of data and policy information in one application will help improve analysis of the energy situation, and policies and their development impact in the region.

UNDP, for its part, supports developing countries with comprehensive programs aimed at removing barriers and de-risking investments to energy access, promoting renewable energy use, and increasing energy efficiency, as part of its broader efforts to reduce poverty, achieve the MDGs, and reduce

[20] www.asiapacificenergy.org

greenhouse-gas emissions to moderate the impact of climate change. In the last 2 decades, the UNDP has mobilized $600 million to help finance energy projects in the region. Specific areas of focus are SE4All's country action processes and support for countries in programming sustainable energy solutions through these UNDP signature areas—distributed renewable energy for development, sustainable rural livelihoods, sustainable cities, and largescale renewable energy for development.

Other development and government partners, such as the World Bank, GIZ, the Global Environment Facility (GEF), the European Union, and the governments of Denmark, Germany, Norway, and the United States, have been supporting Asia and the Pacific programs and initiatives that are directly related to the country action processes of the SE4All. More importantly, such partnerships would not be possible without the full cooperation and support of countries in the region that have already expressed their desire to participate in the SE4All Partnership.

Also worth noting are other significant initiatives and flagship programs in the region that existed even before the launch of the SE4All initiative and are deemed part of the SE4All's action areas. These initiatives and programs include the following, among many others: the Energy for All Initiative and the Clean Energy Program of ADB; Lighting Asia, driven by the World Bank and the International Finance Corporation; Lighting a Billion Lives under The Energy and Resources Institute (TERI), a nonprofit organization in India; the World Bank's Renewable Energy for Rural Economic Development Project in Bangladesh and Sri Lanka; the Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project funded by the UNDP, the GEF, and the Secretariat of the Pacific Regional Environment Programme (SPREP); the Climate Institute's Global Sustainable Energy Islands Initiative; IRENA's Initiative on Renewables and Islands; the Small Island Developing States (SIDS) Sustainable Energy Initiative; and ENERGIA's Women's Economic Empowerment (WEE) program.

To date, the AP-SE4All has already initiated a number of activities which includes:

- The establishment of a partnerships database;
- Coordination with partner organizations and focus countries on current developments and activities being implemented in the fulfillment of SE4All targets in the region;
- Establishing and building partnerships with different organizations to implement activities in the region; and
- Keeping track of different events and activities happening in the region organized by partner organizations and countries.

The regional hub is likewise looking to providing continued support for the country action processes; continuing dialogues on policy, investment and market development; catalyzing investments in energy access, renewable energy, energy energy efficiency and the provision of innovative financing through ADB's Project Development Facility; developing market-based approaches for the delivery and consumption of energy; building synergies among stakeholders through partnerships; improving communication and knowledge sharing through the dissemination of information materials and the development of an interactive Hub website; promoting joint and coordinated action among stakeholders interested in supporting the implementation of country action processes; and mobilizing resources for SE4All activities in the region.

Specifically, with this Summary Report as the first installment in a series of publications to be released every two years, monitoring of SE4All objectives in the region is ensured and will be continuously pursued as the foundation for tracking global progress in meeting SDG7.

5 Conclusion and the Way Forward

This first attempt of the AP-SE4All to monitor the performance of the region and its developing members in meeting the SE4All targets revealed progress in meeting the first two objectives—universal access to energy and improved energy efficiency. Asia and the Pacific economies are on the right track, but whether the pace is sufficient to meet the target by 2030 remains to be seen. With regard to the objective of increasing the share of renewable energy in the energy mix, on the other hand, the performance of the region seems lackluster, as the share was simply maintained from 2010 to 2012. On the upside, there has been progress in recent years. In particular, there has been an exponential increase recently in the contribution of solar and wind energy to electricity generation. This is a welcome development that inspires optimism about the performance of the region in the coming years.

Recognizing the linkages between energy and the health and well-being of women and children, this report noted good practices in the region from which stakeholders can learn. Case studies in the region showed how modern energy can transform women and children's lives, and contribute to overall development. Effects were also observed the other way around. A good number of enterprises in the region have mainstreamed gender effectively into their own business models, providing a case for women as actors of change. Lastly, the report found that government policies that help support gender mainstreaming could push the SE4All agenda forward. With the right policies and regulatory frameworks, women would be encouraged to participate in the planning, financing, implementation, and monitoring of energy projects, especially those that are privately led. These policies and regulations should, however, pave the way for a more inclusive partnership among all stakeholders, including the private sector, for greater effectiveness and sustainability.

The role of governments in advancing the SE4All agenda, particularly in creating an enabling environment, is therefore crucial. This enabling environment is characterized by peace and stability, the rule of law, good governance with accountability and transparency, adequate infrastructure, and an educated and capable workforce. The DMCs surveyed have shown progress, given the significant increase in policy measures and programs aimed at increasing energy access, energy efficiency, and the adoption of renewable energy in the last 5 years. Although the countries are at various stages of policy development, the general trend is the establishment of targets in each area, followed by the continued introduction and expansion of plans and measures to achieve those targets.

The Way Forward

There is mounting interest in the SE4All initiative, especially as the next development agenda has set the international community abuzz. The SDGs provide specific focus on sustainable energy through SDG7, which is based on the three targets of SE4All. Monitoring progress in achieving the SE4All targets will therefore provide the foundation for tracking global progress in meeting the SDGs.

The GTF, a work in progress, has already made headway in this regard. In its 2015 report, the GTF laid down these next steps that must be taken to address current limitations in data quality and data collection:

- **Energy access.** Multitier frameworks will be adopted to address the limitation of energy access indicators as binary measurements. Preparations for global adoption, including the pilot testing of survey instruments and approaches to data analysis in some areas, are under way.
- **Energy efficiency.** In view of the challenges related to data availability and the consistency of country estimates, a consensus-building process will be carried out to resolve issues and gaps concerning the indicators and disaggregation of data. Capacity-building and technical assistance will be provided to help set up and maintain surveying and reporting capacity.
- **Renewable energy.** The methodology is being refined to take the sustainable use of solid biofuels into account, improve the definitions and data collection for distributed renewable energy generation in both off-grid and grid-connected systems, and harmonize the approach to target setting.

The AP-SE4All, for its part, will continuously monitor the countries in the region using GTF information, data from other sources, and input from stakeholders. To address the identified gaps and challenges in monitoring the region's progress and advancing the SE4All goal, the following actions are proposed.[21]

- **Strengthen regional collaboration.** Multi-stakeholder engagement within the region is essential in ensuring a consensus-based system of monitoring. Input from the different stakeholders—government, the private sector, and civil society—will also help data collection and improve analysis. Consultations must be consistently done through a regional platform.
- **Encourage government buy-in.** Input from governments will enhance the accuracy of data and analysis. At the same time, increased ownership and accountability will provide governments with an incentive to push the SE4All agenda. A network of focal government agencies was also suggested to facilitate collaboration among partner countries.
- **Develop the capacity of actors involved in monitoring.** Statistical agencies of governments must gain increased capacity to align the methods they use with GTF methods. Training should also be provided to civil society and the private sector, which must be involved in country-level monitoring to increase transparency and accountability.
- **Expand the knowledge database.** Documenting country-specific experiences, particularly emerging good practices, will broaden understanding of the issues and gaps, and offer more ideas about how to better capture actual information to improve monitoring. Information sharing will also allow countries to learn continuously from one another.
- **Build the database of policy interventions.** Aside from the numbers, information about policies and government initiatives in the region will show policy makers what has worked elsewhere in the region and help them in their decision making.

[21] These recommendations are based on discussions during the SE4All consultation workshop in June 2015.

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Sustainable Energy for All Status Report

Tracking Progress in the Asia-Pacific: A Summary Report

The Sustainable Energy for All (SE4All) initiative is the global effort rallying action towards a transformation in the energy sector by the year 2030. With targets to increase energy use, expand energy efficiency, and ensure energy access for all, SE4All's priorities are tied closely to the challenges of developing Asia and the Pacific, which is confronting issues of energy sustainability, security, and widespread energy poverty.

In the interest of combining efforts and resources to meet the challenge, the Asian Development Bank, the United Nations Development Programme, and the United Nations Economic and Social Commission for Asia and the Pacific have partnered to act as the leading organizations for the SE4All Regional Hub for Asia and the Pacific. Together, they are supporting actions among developing countries in the region that will put them on track to transform their energy sectors, in line with SE4All. This report summarizes the initial activities of the Regional Hub, and contextualizes the challenges in Asia and the Pacific with the global efforts to reach the 2030 targets.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to the majority of the world's poor. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

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