

Abu Dhabi | UAE

Plenary Session 2:

Advancing Inclusive Access to Secure Affordable and

Sustainable Energy Services





The observations presented herein are meant as background for the dialogue at the 8th Asian Ministerial Energy Roundtable. They have been prepared in collaboration with Boston Consulting Group and should not be interpreted as the opinion of the International Energy Forum or Boston Consulting Group on any given subject



Introduction



Market context

For policy and industry leaders to deliver responsible growth in the Age of Change, energy sector transformations require a holistic consideration of all available technologies. Making access to secure, affordable, and sustainable energy services as inclusive as possible goes beyond alleviating energy poverty alone.

Collective efforts must be stepped up so that transformations provide equitable opportunities that engender inclusivity and empower responsible growth to 2030 and beyond



Session objectives

- What are the impediments for government and industry to achieve energy access goals, overcome energy poverty, and provide equitable choices?
- Which policy, and industry tools hold the most promise to deploy technology solutions that alleviate energy poverty and ensure reliable access?
- How can evolving policy and industry insight as well as data be leveraged and improved?
- How can IEF accelerate government-industry efforts?



Key Question

How can universal energy access and affordability be promoted, and what is the role of government in creating a conducive environment?

Still work to do to ensure global access to electricity

Billions of people without electricity access



Note: A scenario with high GDP growth but lower increase in population Source: World Energy Council, IEA Outlook 2017



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World electrification reached 89% in 2017, growing at fastest rate since 1990







Energy Access is a key enabler for Sustainable Development





High energy access translates into economic and social development for countries

Levels of electrification positively correlated to per capita income (2017)

Per Capita income (\$)



Per Capita income (US\$) • Access to electricity (%)



Energy access: What it means to society?





Access to Clean Energy improves the quality of life by reducing health hazards

Lower number of pre-mature deaths from household air pollution in countries with higher access to clean cooking fuel



Premature deaths from household air pollution (per 100,000 people) — Access to clean cooking fuel (%) Source: World Bank; Global Burden of Disease Study



Yet, there are ~2.7B people globally without access to clean cooking almost two thirds of them in Asia

Close to 4M premature deaths annually linked to household air pollution



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Energy access is a key enabler for achieving sustainable Economic, Environmental, Health and Social development



Economic

- Improved productivity
- Extended operation hours of small businesses
- More mobile connectivity
- Time savings for fuel purchases incl.
 Fuel savings
- Job creation in supply chain



Environment

- Reduced greenhouse gas emissions (CO2 and black carbon)
- Less landfill from disposable kerosene lanterns



Health

- Reduction of fire hazards
- Reduce exposure to particulate matter
- Reduce risk of accidental ingestion of kerosene
- Reduce risk of compromised visual health



- Longer hours of better illumination
- Improved education
- Improved safety
- Improved social cohesion and leisure quality



Micro grid/off grid a viable option—60% of new generation to be connected to these grids if full electricity access is to be achieved

Generation requirements for universal electricity access, 2030



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Multiple avenues where technology helped increase energy access



Energy storage

 Cost of lithium-ion batteries has decreased more than 70 percent since 2012



Block-chain

• Enabling excess output from wind plants in northern Germany to be discharged into a networked pool of home battery storage systems



Mobile Phones

 Many solar home systems are deploying with new mobile platforms and pay-as-you-go (PAYG) financing, helping consumers overcome the high upfront costs of the technology



Energy efficiency

 New business models providing off-grid access with solar PV are bundling with efficient appliances to decrease electricity demand



India's commitment to electrify households is leading progress towards universal energy access

1.7 1.5 1.0 0.5 0.4 0.2 2000 2010 2017 Rest of World India Other developing Asia Sub-Saharan Africa Southeast Asia

People without access (B)

India's access to electricity evolution

Universal household electricity access by 2022 was a central political commitment in India's 2014 national elections and the government has placed a high priority on delivering it

India's Government has launched the scheme "Deendayal Upadhyaya Gram Jyoti Yojana" (DDUGJY-RE) for rural electrification. Ministry of Power has sanctioned 921 projects to electrify ~1.2M un-electrified villages, to intensify electrification of ~6M partially electrified villages and provide free electricity connections to ~40M BPL rural households

Over 99% of people who have gained access in India since 2000 have done so as a result of grid extension

India's continued emphasis on electrifying households means it is expected to reach universal electricity access in the early-2020s, with renewables accounting for about 60% of those who gain access (...)—one of the largest electrification success stories in history International energy agency, 2017



China is advocating for a change by investing in clean energy and reducing the use of biomass as cooking fuel

China's cooking fuels¹ use evolution



People (B)

China was the first of the large emerging countries to achieve access to electricity to its entire population in 2015

Share of the population relying in solid fuels for cooking declined between 2000 and 2015 from over one-half to one third. The use of biomass has experienced a decline of ~6% per year since 2010. Meanwhile, LPG, natural gas and electricity demand have all been increasing by around 10% per year

In 2017 it was the country with the highest investment in clean energy: ~\$147B dedicated to develop infrastructure for solar (~60%) wind (~35%) and other renewable energy (~5%)

China probably achieved the largest improvement in energy efficiency in world history in terms of the population affected in one program. The National Improved Stove Program (NISP) and its provincial counterparts were initiated in the early 1980s and are credited with introducing nearly 200M improved stoves by the late-1990s

Clean cooking alliance, 2010

1. Excluding Kerosene which is used by less than 10m people in China Source: IEA world energy outlook 2017, BNEF, clean cooking alliance



Renewables, micro-grids and clean cookstoves are the local measures to reinforce energy access





But they are facing some challenges in developing countries



Policy framework

(foreign) investors

CapEx financing

Openness to

and support policies

Challenges

Barriers





Regulation (e.g., mandatory replacement, capital subsidy also for solar and storage)

Customer awareness

CapEx financing



Off-grid/mini-grid solutions

Uncertain/low customer demand

Technical problems

Uncertainty around grid connection

CapEx Financing (e.g., high tariffs)

High O&M costs



Clean cook stoves

Awareness/Educ.: Consumer adoption and correct usage

Stove design

Distribution (stoves and fuel)

Financing (CapEx and OpEx)



Pico solar/solar home systems

Regulation (VAT and import levies)

Distribution

CapEx Financing/Customer lease financing

Notes: Global impact estimates take into account current household expenditure and affordability of clean systems. Lower-bound estimates Source: IFC; Hystra; CSE; BCG Analysis



Natural gas is the best macro level solution to partner with renewables and provide A2E for all uses to dev. countries

Natural gas plants are cheaper to build and operate



Gas is the most flexible, multi-purpose, source of energy for all basic needs of the modern society such as electricity, industrial production and manufacturing, clean comfort and clean transport. On top of this, it is efficient, secure, accessible and it compliments renewable energy

The switch from coal to natural gas is a proven success factor in significant reduction in respiratory diseases such as asthma and emphysema, and helps cities win the battle against pollution

Large-scale generation can replace coal offering a low cost reliable option while small-scale generation can be coupled with mini-grids to provide power to rural areas. Switching to natural gas requires government backing, new policies, and funds but currently LNG its enhancing the expansion in developing countries

Natural gas and other gaseous fuels, such as LPG, lie near the top of what has been called the household "energy ladder" or "fuels ladder". As population climbs this ladder, they climb other development ladders such as the financial inclusion ladder, the health ladder and the education ladder therefore improving their life and supporting sustainable development

1. Average construction cost for selected technology types in 2015 (EIA) Source: IGU, IEA



Liquefied petroleum gas (LPG) is an extremely versatile solution that is enhancing A2E in developing countries

Switching to LPG helps address the 4M annual deaths from illnesses linked to household air pollution



LPG is extremely versatile and portable. It can be transported by sea, rail or road transport and it does not require a huge infrastructure to support it being an ideal solution for developing countries' rural areas

LPG is usually the first clean fuel that consumers use when moving away from biomass. It has an efficient and clean emission profile with 50% fewer carbon emissions than coal and 20% fewer than heating oil

More that 50% of China's urban population and nearly 80% of Indian households are using it for cooking

Cameroon adopted its first national LPG master plan in 2016, partnering with the Global LPG Partnership to craft policies, reforms, and define investments and interventions to increase the share of households cooking with LPG from about 12% in 2014 to 58% by 2030

1. LPG use meets WHO emissions reductions guidelines for health and is recognized by WHO as a healthy cooking fuel Source: IEA, WLPGA, WHO



Gas will help achieve universal A2E and address energy poverty in an economic way while protecting the planet

Secure supplies of natural gas improve the reliability of power supply, increasing economic productivity

NG consumption indexed growth



Highly polluting fuels, including coal, biomass, and kerosene are the primary source of household energy for 41% of the world population, leading to ~4M of premature deaths, mainly women and children

China is leading the global increase in NG consumption and both India and Africa are empowering NG in their energy mix

- Chinese authorities aim to reduce air pollution, diversify energy supplies away from coal (switch to clean cooking) and develop advanced new energy industries. To achieve that goal, they are investing in the expansion of the production and consumption of NG
- India is moving towards a gas based economy. They plan to increase natural gas consumption more than 2.5 times by the end of next decade. They will strengthen the gas infrastructure in the country by increasing the number of LNG terminals
- Nigeria and Tanzania are two countries in sub-Saharan Africa in which natural gas is likely to remain essential for meeting the growing energy demand in the medium to long term



EAP is an Oil and Gas platform of knowledge sharing that takes action and gives an unified voice to A2E





SE4ALL, EAP and other organizations are playing a key role to achieve universal energy access



China and India are living proof that a transformation is possible as millions of people's life are being positively impacted from gaining access to electricity and clean cooking thanks to initiatives that SE4ALL, EAP and other organizations are promoting



Sub-Saharan Africa, with ~600M people without access to electricity and ~900M without access to clean cooking, is falling behind this transformation and so it is key to strengthen current actions, launch new initiatives and raise awareness to enhance A2E



LPG

Empowering natural gas in the energy mix and LPG usage as clean, reliable and accessible solutions to A2E will help developing countries climb a step further in the energy ladder contributing to the much needed social and economic welfare





 SEforALL mission is to empower leaders to broker partnerships and unlock finance to achieve universal access to sustainable energy – as a contribution to a cleaner, just and prosperous world for all



- Leverage oil and gas industry knowledge
- Grow welcoming new members and joining forces
- Act as a unified voice for A2E advocacy
- Promote and take action

EAP is the enabler for oil and gas industry to contribute to A2E



All companies and organizations that can have a meaningful impact on A2E are welcome to join EAP

O&G companies

O&G international organizations



Other support entities

EAP members take action by launching projects and becoming advocates for the A2E issue

Illustrative

	Project	Details
		Helping to fund 30 Nigerian early-stage companies in their quest to develop new energy solutions
Τοται	Total access to energy	Develop long-term solutions to the A2E problem such as off-grid solar solutions. Aiming to impact 25M people in Africa by 2020
Shell Foundation 🥮	Philippines shell project	Funded a microgrid that uses hydropower and solar energy to bring electricity to Batak tribe, transforming over 200 people's life
Shell Foundation	Lighting in Sub-Saharan Africa	Support the rollout of the social enterprise d.light in Kenya and Tanzania empowering 424,000 people with a lantern to replace kerosene
THE CLOBAL LCC PARTNERSHIP	Bottled gas for better life	Microfinance project to make LPG more affordable by providing loans to families in Cameroon to switch from solid cooking fuels to LPG
OMV	Healthy homes project	Support low income families in New Zealand by providing, insulation, water proofing and energy solutions to more than 200 homes
THE GLOBAL LPG PARTNERSHIP	Rwanda	Supporting Ministry of Infrastructure to expand LPG use to ~40% of population by 2024

LPG adoption across India is supported by EAP members





4th IEF-OFID Symposium on Energy Poverty 2-3 May 2019 Cape Town, South Africa



IEF-OFID Dialogue with Africa hosted by South Africa focused on

Challenges and Opportunities in Electrification Access to Clean Cooking Solutions Key Indicators for Energy Poverty and the Role of Data Transparency Energy Access Financing and Policy Formulation Synergies and Collaborations

With

HE Jeff Radebe MP, Minister of Energy of South Africa

150 senior representatives from the private and public sector of African countries and International Organisations



Key questions



What are the impediments for government and industry to achieve energy access goals, overcome energy poverty, and provide equitable choices?



Which policy, and industry tools hold the most promise to deploy technology solutions that alleviate energy poverty and ensure reliable access?



What are the alternatives to reduce energy poverty without incurring in hefty subsidies that can cripple future developments?

4 How can evolving policy and industry insight as well as data be leveraged and improved? How can the IEF accelerate government-industry efforts?





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