Energy Poverty - Transition from a Low to a Middle Income Country

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SAARC Workshop

Participation of Private Sector in Overcoming Energy Poverty in SAARC Member States

Dambulla, Sri Lanka, 29 – 30 August 2019

LINE UP

We did

Understand

- Energy Poverty
- Challenges
- Solutions
- Optimum roles for PPPs

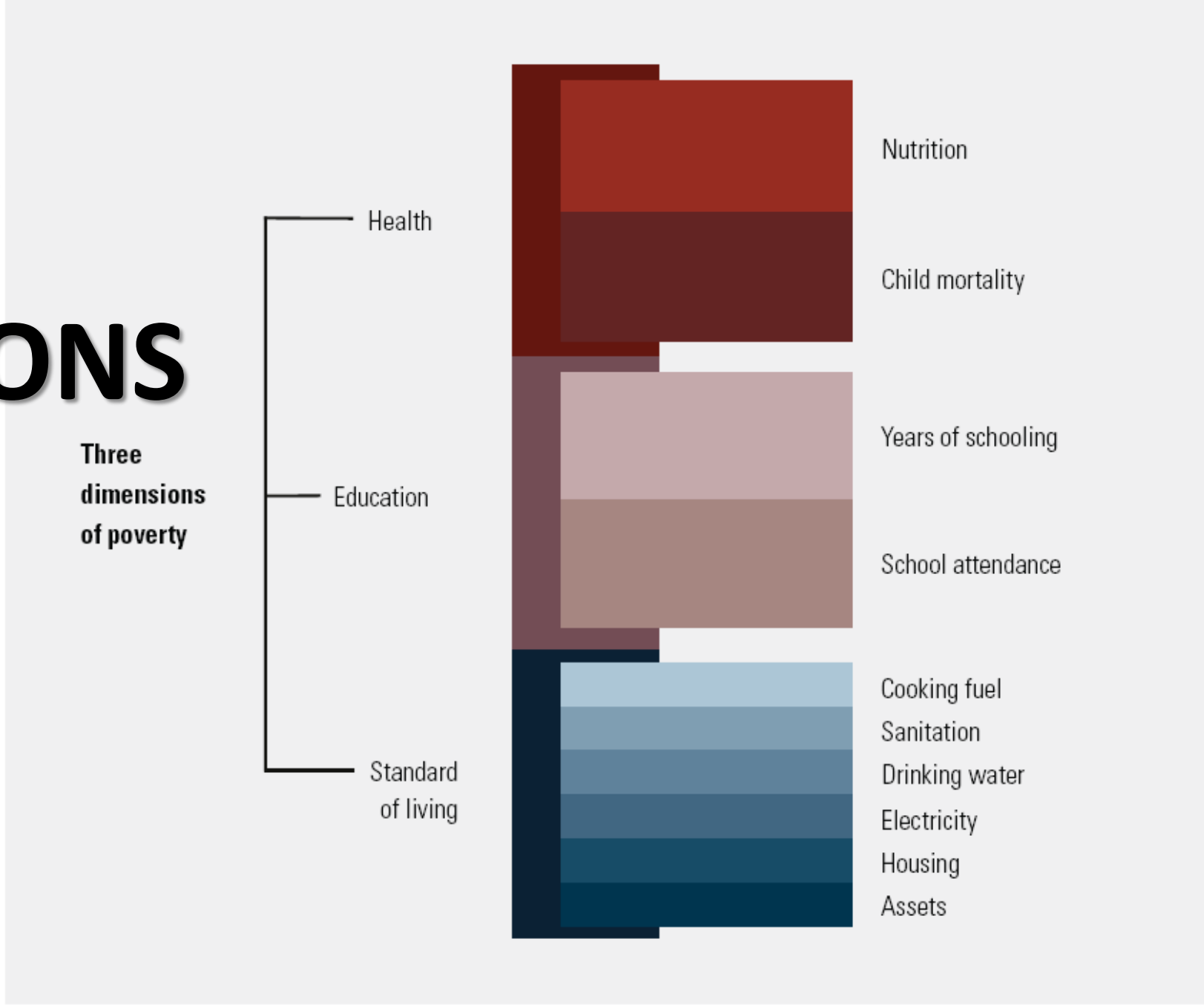
Now on - Transition

Low to Middle Income

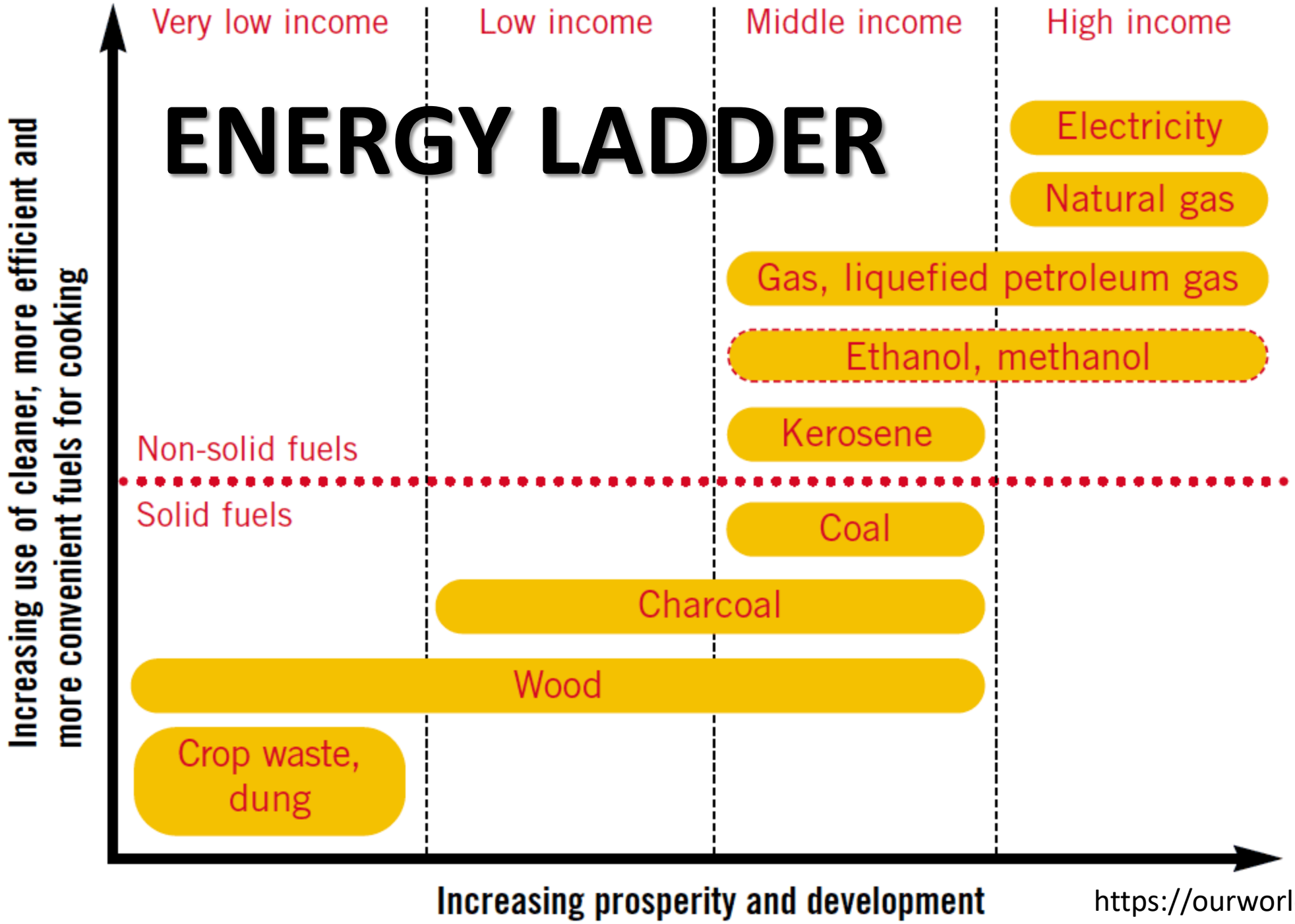
Later & Tomorrow

- Energy Markets and Financing Landscapes
- Inclusive Electricity Tariffs
- Off & On-Grid Sustainable Solutions
- Business Models
- Way Forward

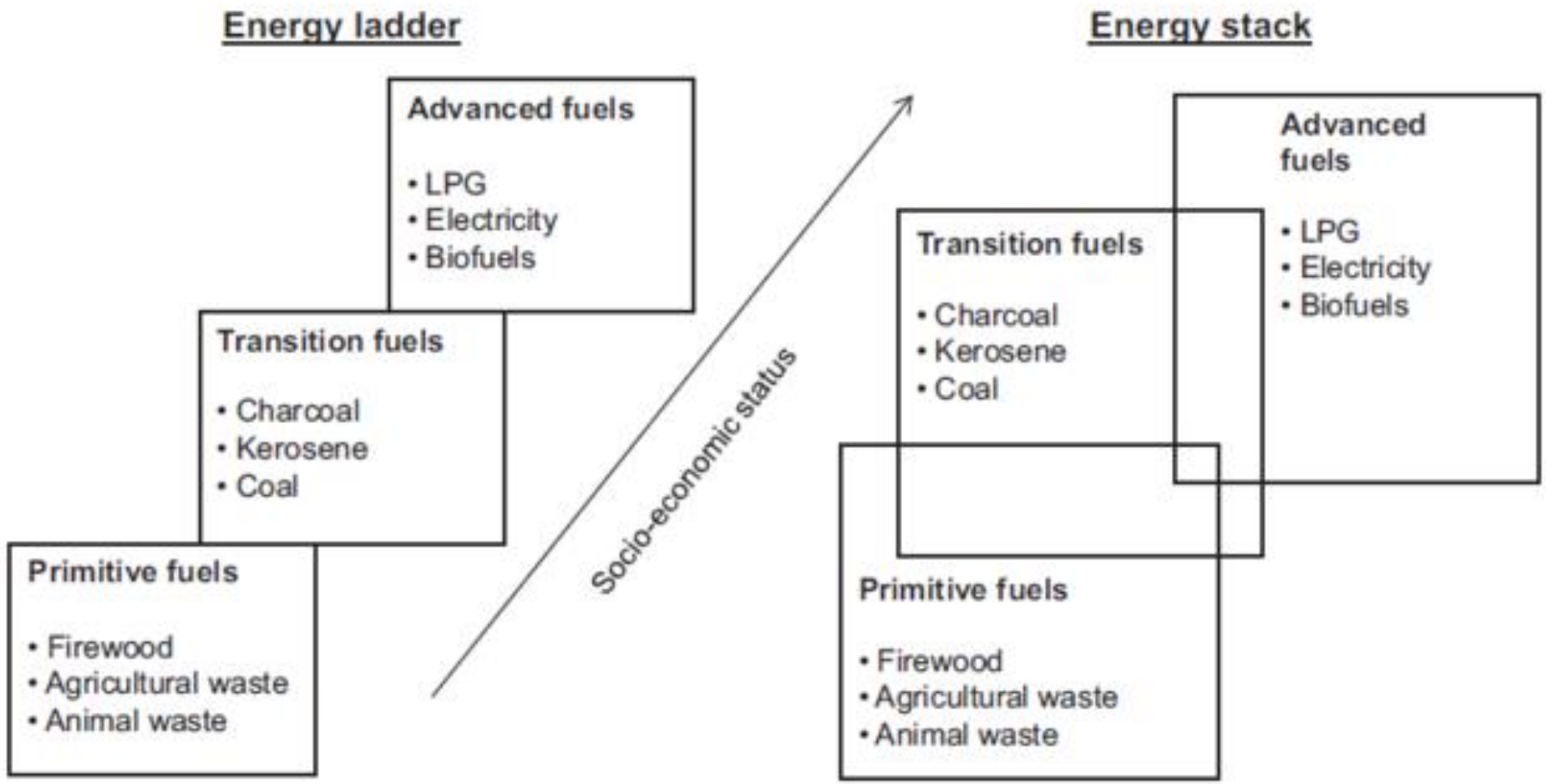
POVERTY DIMENSIONS



Source: Oxford Poverty and Human Development Initiative 2018.



https://ourworldindata.org


Energy ladder
Advanced fuels
• LPG
• Electricity
• Biofuels
Transition fuels
• Charcoal
• Kerosene
• Coal
Primitive fuels
• Firewood
• Agricultural waste
• Animal waste
Socio-economic status
Energy stack
Advanced fuels
• LPG
• Electricity
• Biofuels
Transition fuels
• Charcoal
• Kerosene
• Coal
Primitive fuels
• Firewood
• Agricultural waste
• Animal waste

ENERGY POVERTY … WHAT?

- Energy Poverty
- Fuel Poverty
- Energy Deprivation
- Energy Injustice
- Energy Inequalities
- Energy Consumption
- Energy Services
- Access, Availability, Flexibility and Affordability

ENERGY POVERTY Vs FUEL POVERTY

Inability to attain a socially and materially necessitated level of domestic energy services

Energy Poverty (IEA)

Lack of access to modern energy services. Energy poverty normally refers to communities and families that live in developing countries and cannot afford to pay for basic energy services; by extension, it infers that their basic living needs are not being met.”

Fuel Poverty (England)

A household is fuel poor if required energy costs are higher than those of the nation-wide median, while pushing them below the ‘official poverty line’.

Energy poverty (in a capability framework) - inability to realize essential capabilities as a direct or indirect result of insufficient access to affordable, reliable and safe energy services, and taking into account available reasonable alternative means of realizing these capabilities.

Energy deprivation - inability to secure adequate energy services

Energy service poverty - Ensuring an adequate match between energy resources, technical infrastructures and household needs, alongside fuel access, incomes and energy efficiency.

Energy vulnerability - multiple risk factors contributing to precariousness of particular spaces and groups of people

Ian Hamilton, 2017

ENERGY POVERTY

- No Globally agreed definition
- Absence of choices to access enough,

affordable, reliable, high quality, safe and environmentally benign energy services to support economic and human development

A person is in ‘energy poverty’

if have no access to at least:

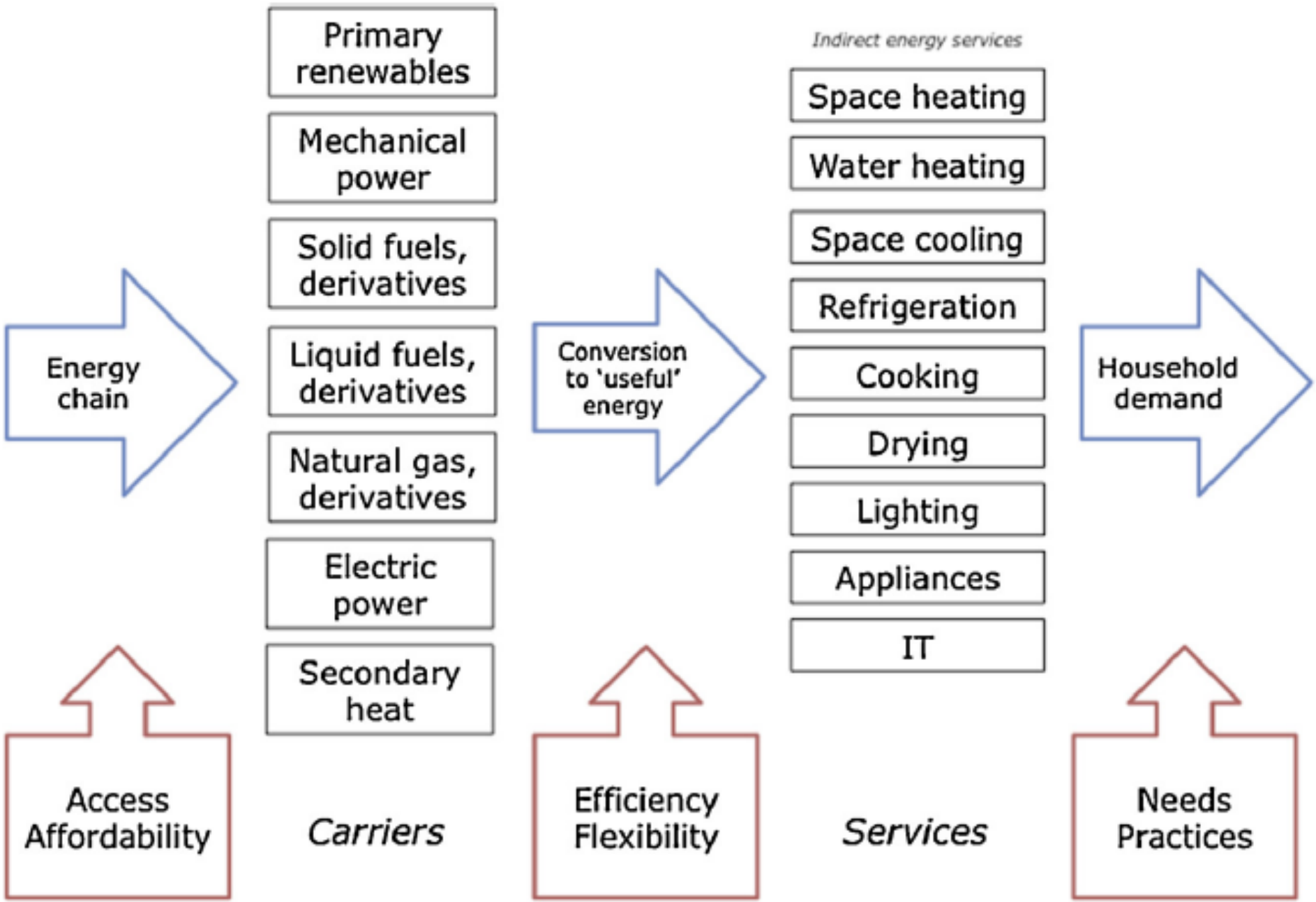
(a) Equivalent of 35 kg LPG for cooking

(b) 120kWh electricity per capita per year for lighting

(one definition)

economist.com

ENERGY SERVICE DELIVERY INFLUENCING DIMENSIONS



(Bouzarovski & Petrova, 2015)

ENERGY POVERTY MEASUREMENT APPROACHES

Expenditure Approach:

Household's expenditure in energy (absolute or % of total expenditure)(set thresholds)

Consensual (self-reported) Approach:

Households who declare facing difficulties to meet basic energy services (Perceived Deprivation)(asking people, subjective)

Outcome based – cold linked mortality, power disconnections

Temperature based – internal temperature adequacy of energy services compared to pre-defined standard (say 18–21^{0}C)

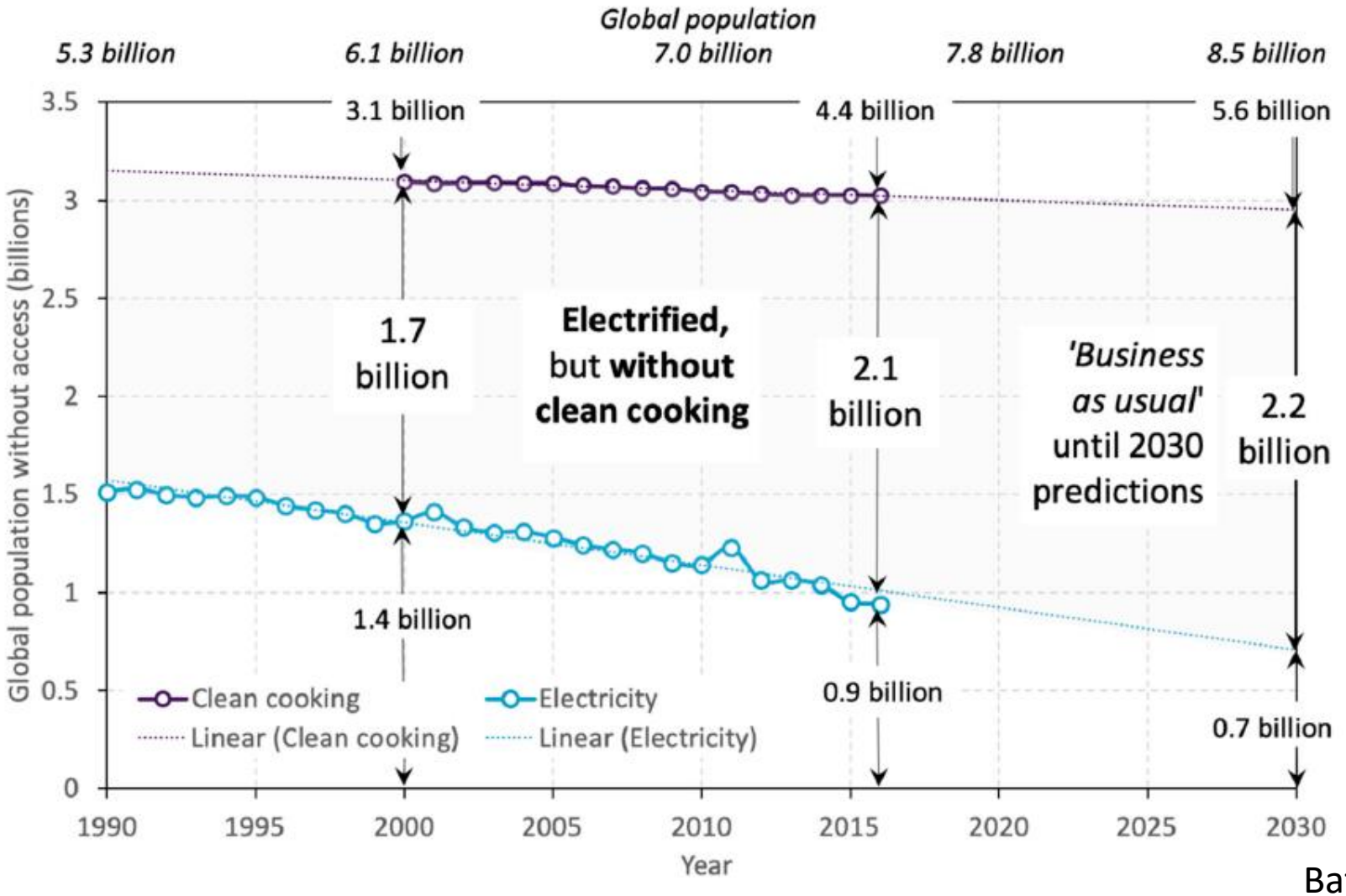
REASONS FOR ENERGY POVERTY

- 1.1 billion people still have no access to electricity.
- 2.9 billion use solid fuels cooking and heating

- Remote populations
- Unhealthy cookstoves
- inefficient utilities;
- perceived investment risks;
- untapped renewable energy

World Bank, 2015

GLOBAL POPULATION DEPRIVED OF ENERGY ACCESS



Batchelor et al, 2019

GLOBAL AGENDAS

- SDGs
- NDCs
- Electricity for All
- Energy for All
- Total Energy Access
- Sustainable Energy for All
- Energy Security
- Energy Independence

Goal 7:

Ensure access to affordable, reliable, sustainable and modern energy for all.

SDG 7 - CORE TARGETS

7.1. Ensure universal access to affordable, reliable and modern energy services

7.2. Increase substantially the share of renewable energy in the global energy mix

7.3. Double the global rate of improvement in energy efficiency

7. A. International cooperation on energy.

7. B. Energy infrastructure

SOUTH ASIA

Country	Population (millions) 2018*	GDP per capita (current, US$) 2018*	Access to electricity 2017**
Afghanistan	36.4	502	97.7
Bangladesh	166.9	1,642	88.0
Bhutan	0.8	3,321	97.7
India	1,356.6	2,008	92.6
Maldives	0.4	12,108	99.8
Nepal	29.6	973	95.5
Pakistan	200.4	1,560	70.8
Sri Lanka	21.5	4,007	97.5

World Bank, 2019: * South Asia Macro Poverty Outlook, ** Access to electricity (% of population)

SUSTAINABLE DEVELOPMENT INDEX 2019

Rank	Country	Score
1	Denmark	85.2
2	Sweden	85.0
3	Finland	82.8
13	UK	79.4
15	Japan	78.9
20	Canada	77.9
35	USA	74.5
66	Singapore	69.6

Country	Rank	Score
Afghanistan	153	49.6
Bangladesh	116	60.9
Bhutan	84	67.6
India	115	61.1
Maldives	47	72.1
Nepal	103	63.9
Pakistan	130	55.6
Sri Lanka	93	65.8

Sustainable Development Solutions Network, 2019

HUMAN DEVELOPMENT INDEX 2017

Rank	Country	HDI
1	Norway	0.953
2	Switzerland	0.944
3	Australia	0.939
9	Singapore	0.932
12	Canada	0.926
11	Denmark	0.929
13	USA	0.924
14	UK	0.922

Country	Rank	HDI
Afghanistan	168	0.498
Bangladesh	136	0.608
Bhutan	134	0.612
India	130	0.640
Maldives	101	0.717
Nepal	149	0.574
Pakistan	150	0.562
Sri Lanka	76	0.770

United Nations Development Program, 2018

ACCESS TO ELECTRICITY

- Measure % of households
- Quantity (hours per day)
- Quality (V, f, fluctuations)
- Limit of use (Phases, Watts)
- Tariff
- Cost of connection
- Payment schemes
- Incentives / Subsidies
- Market mechanism

ACCESS TO MODERN FUELS

To meet Cooking & Heating Needs as Primary Fuels

- Electricity (Grid, Micro Grid, PV, Wind, other Res)
- Gaseous fuels (LPG, CNG, PNG, Biogas)
- Liquid fuels (Kerosene, Ethanol, Biofuels)

Interim?

- Pellets, Briquettes, Charcoal

Exclude

- Traditional biomass (Firewood, Dung, Crop Residues, Shrubs, Grass)
- Industrial residues (Saw Dust, Paddy Husk, Wood Shavings, Straw)
- Coal, Coal Dust and Lignite

ACCESS TO MECHANICAL POWER

Use mechanical power for productive applications

- Water Pumping
- Grinding
- Milling
- Tea Factories

DIRECT ACCESS TO REs & MUSCLE POWER

- Solar PV
- Solar Thermal (Water Heat, Cookers, Dehydration, Dry Cloths)
- Natural Lighting & Ventilation
- Wind Mills
- Wind & Water based transport
- Gravity (water supply, ropes, ram pumps)
- Animal and Human Muscles

EFFICIENT APPLIANCES AND END USE

- Energy Awareness and Consciousness
- Energy Conservation
- Efficient Appliances
  - Electrical Appliances
  - Cook Stoves (ICS, Chimney & Hood, Enclosure, Grate)
  - WGS - Natural or Forced Draft
- Protective Devices (voltage safeguards, wiring)
- Prevent re-bound effect
- Energy Labels

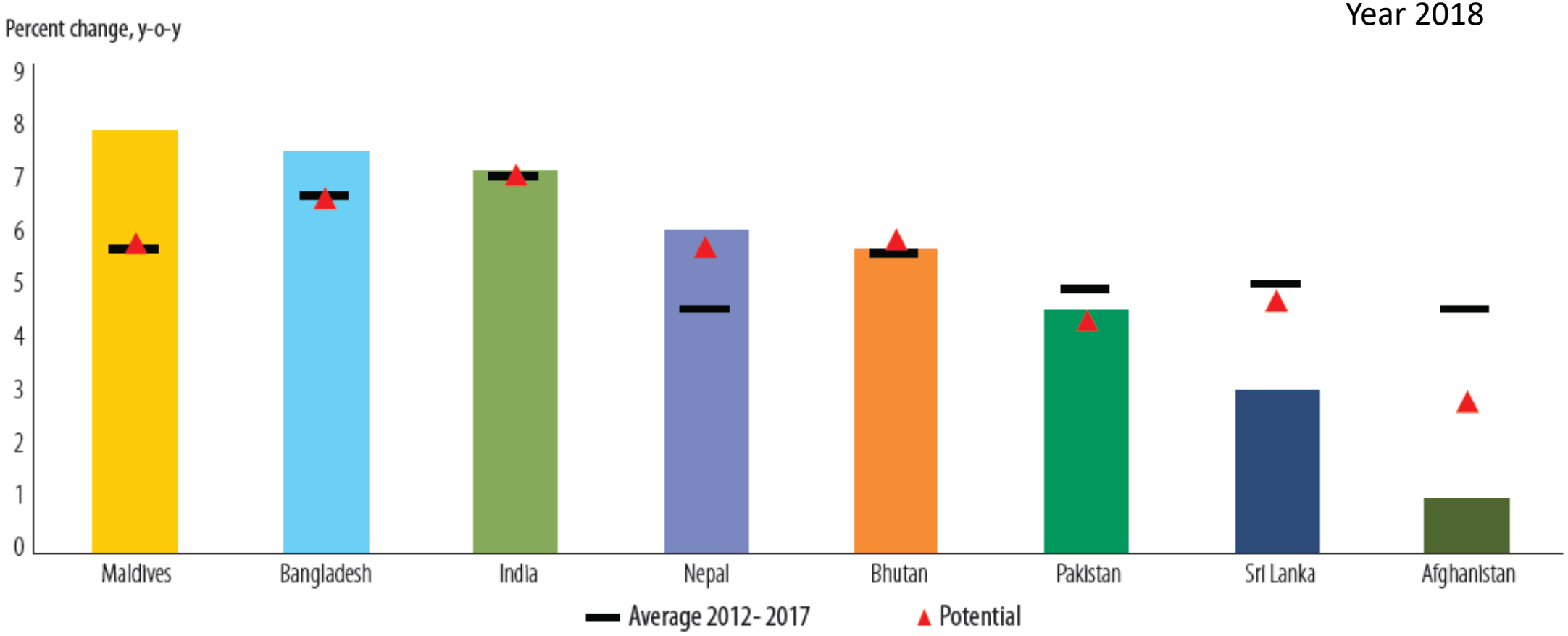
CHALLENGES

- Affordability
- Access and Supply Chain
- Infrastructure
- Technology
- Quality
- Awareness (Safety and Energy Efficiency)
- Policy
- Finance & Investments
- Governance, Corruption, Population Density, Higher Costs, Leakage

SOLUTIONS

- Affordability – Access to Finance, Incentives (Subsidies ?)
- Market Mechanism and Supply Chain (Business Models)
- Entrepreneurship Development
- Investments on Infrastructure
- Efficient Appliances (cook stoves, refrigerators)
- Develop or Transfer (Appropriate) Technology
- Standards and Quality (Electricity, Fuelwood, Appliances)
- MEPS & Eco Labels (Energy Star)
- Awareness (Safety and Energy Efficiency)
- Policy (Electrification)
- Conducive Policies (household energy)
- Consumer Protection, Citizens Charter

GDP GROWTH RATES



Source: World Bank, 2019

HELP IN… MIDDLE INCOME COUNTRY

- Increased quality of life & Standard of living
- Get other facilities & Disposable income
- Cleaner environment (Air Quality)
- Well educated and informed
- Reduced health risks
- Narrow rich – poor divide, social recognition
- Economic opportunities & Efficient production & livelihoods
- Increased safety & Reduced time, cost, effort on securing energy
- Energy = Engine of Growth, Energy Intensity, Conservation, Efficiency

MIDDLE INCOME TRANSITION (TRAP)

Middle-income economies stuck - stagnate in the middle-income range

- Shift from resource-driven (cheap labor and capital) growth
- Investments in education and infrastructure
- Creativity and breakthroughs in science and technology
- Improve efficiency and productivity
- Innovation
- Market competitiveness

THANKS

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