



# GLOBAL TRACKING FRAMEWORK



SUSTAINABLE ENERGY FOR ALL

COORDINATORS:



# **We now have a global tracking framework for SE4ALL**

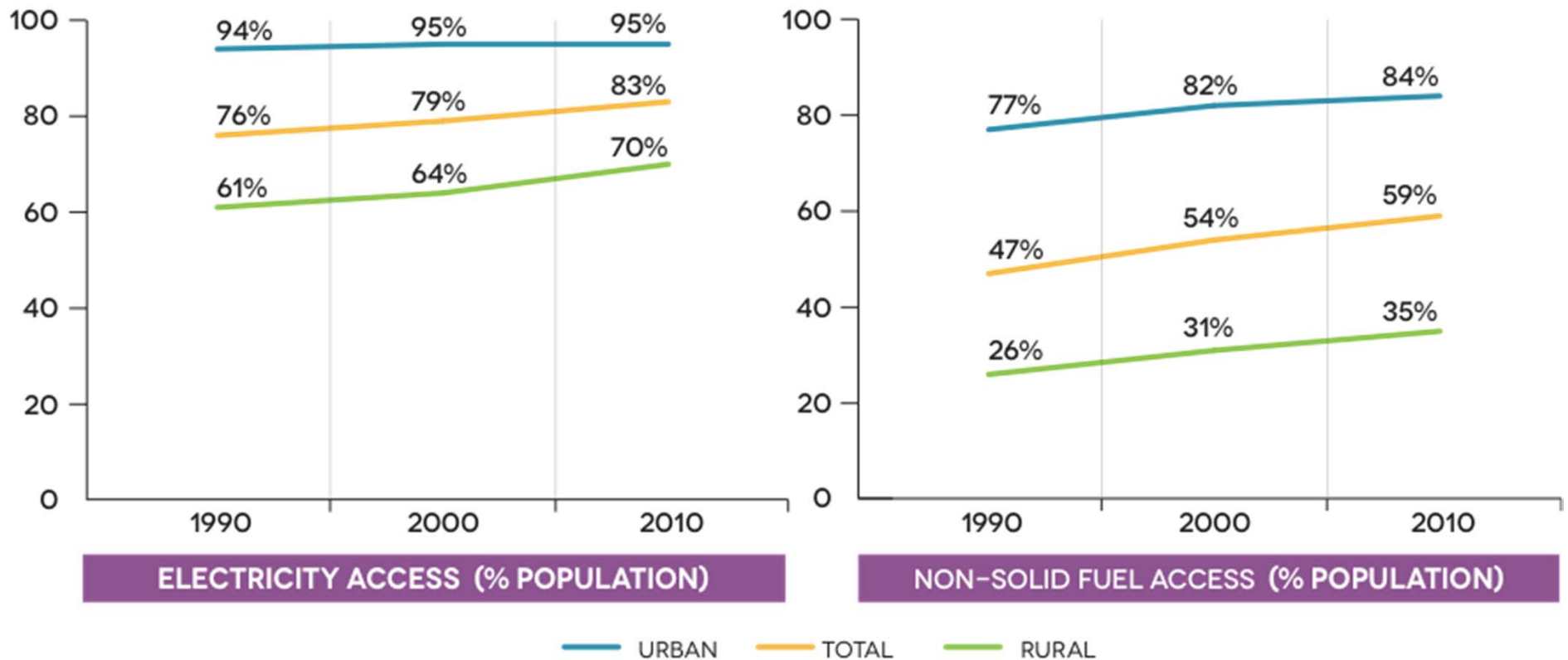
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- **Process of consensus building among 15 partner agencies and 100+ stakeholders in two rounds of public consultation**
- **Data platform**
  - 180+ countries covering 98% of global population
  - 20 year history 1990-2010
  - Main sources are household surveys and national energy balances
  - Collated from primary data held by IEA, UN, WB, WHO
- **Central (plus supporting) indicators**
  - Percentage of population with an electricity connection
  - Percentage of population making primary use of non-solid fuels
  - Percentage of total final energy consumption from renewable sources
  - Compound annual growth rate of primary energy intensity to GDP in PPP



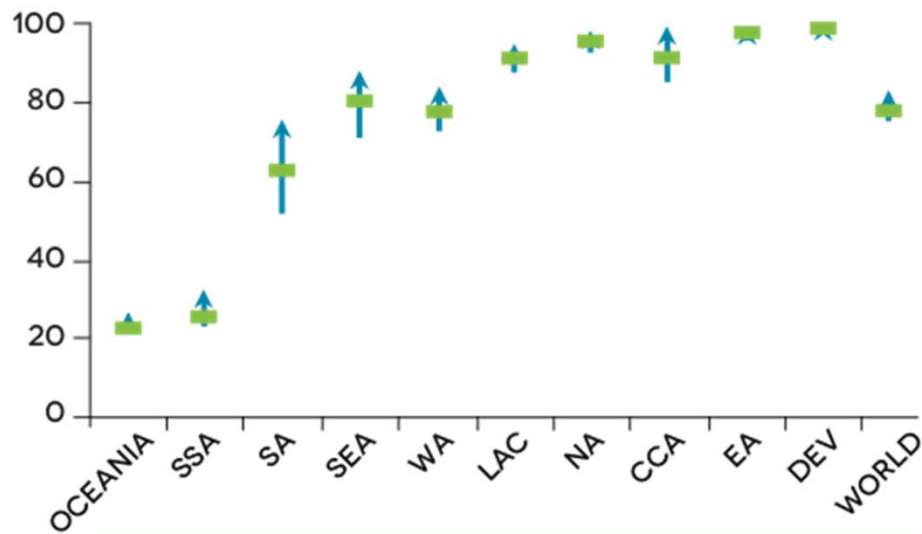
# ENERGY ACCESS

# Access to modern energy rose slightly driven by increase in rural access rate

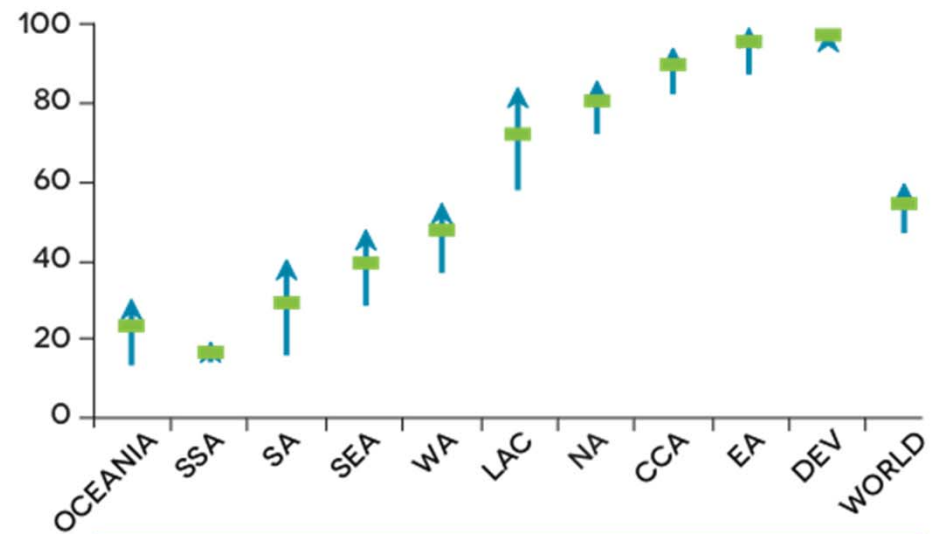


SOURCE: WB, WHO

# Access rates range widely across regions, as does extent of progress in last 20 years



GLOBAL AND REGIONAL TRENDS IN ELECTRIFICATION 1990-2010, PERCENT

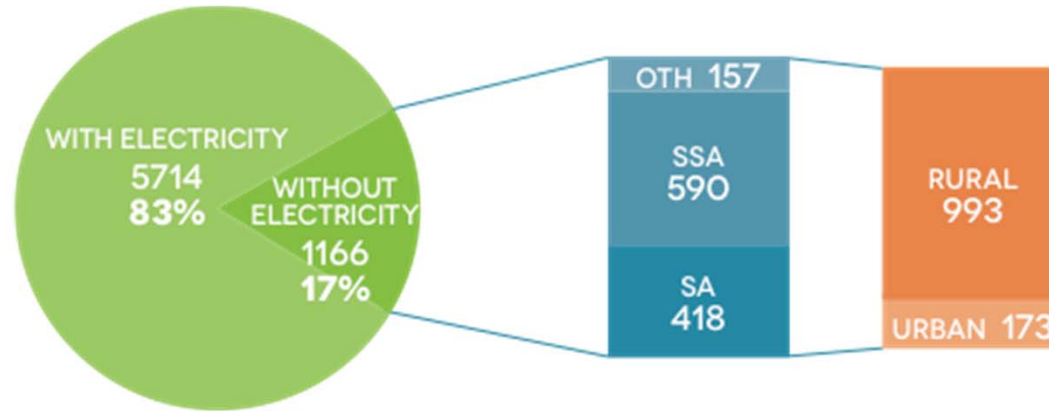


GLOBAL AND REGIONAL TRENDS IN ACCESS TO NON-SOLID FUEL 1990-2010, PERCENT

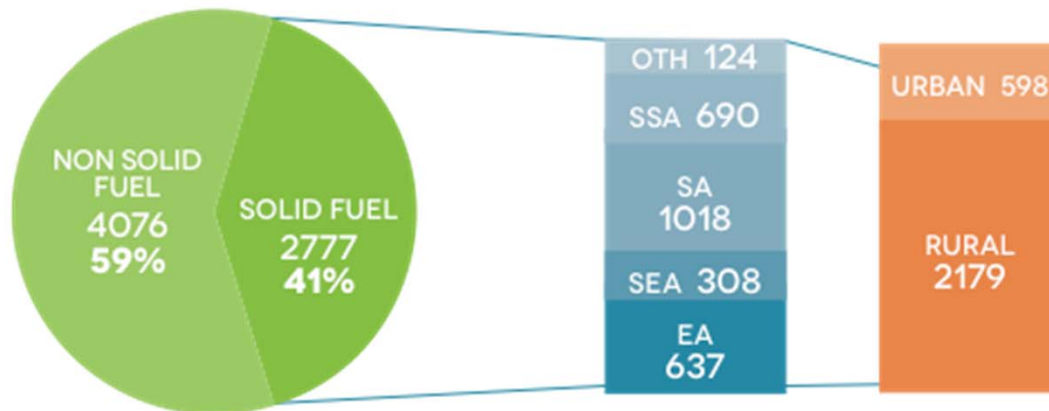
1990 2000 2010

**SOURCE:** WORLD BANK GLOBAL ELECTRIFICATION DATABASE, 2012 INDICATORS (WORLD BANK); WHO GLOBAL HOUSEHOLD ENERGY DATABASE, 2012.  
**NOTE:** ACCESS NUMBERS IN MILLIONS OF PEOPLE. CCA = CAUCASUS AND CENTRAL ASIA; DEV = DEVELOPED COUNTRIES; EA = EASTERN ASIA; LAC = LATIN AMERICA AND CARIBBEAN; NA = NORTHERN AFRICA; SEA = SOUTH-EASTERN ASIA; SA = SOUTHERN ASIA; SSA = SUB-SAHARAN AFRICA; WA = WESTERN ASIA.

# Still, 1.2 billion people live without electricity and 2.8 billion cook with solid fuels



SOURCE OF ELECTRIFICATION ACCESS DEFICIT, 2010

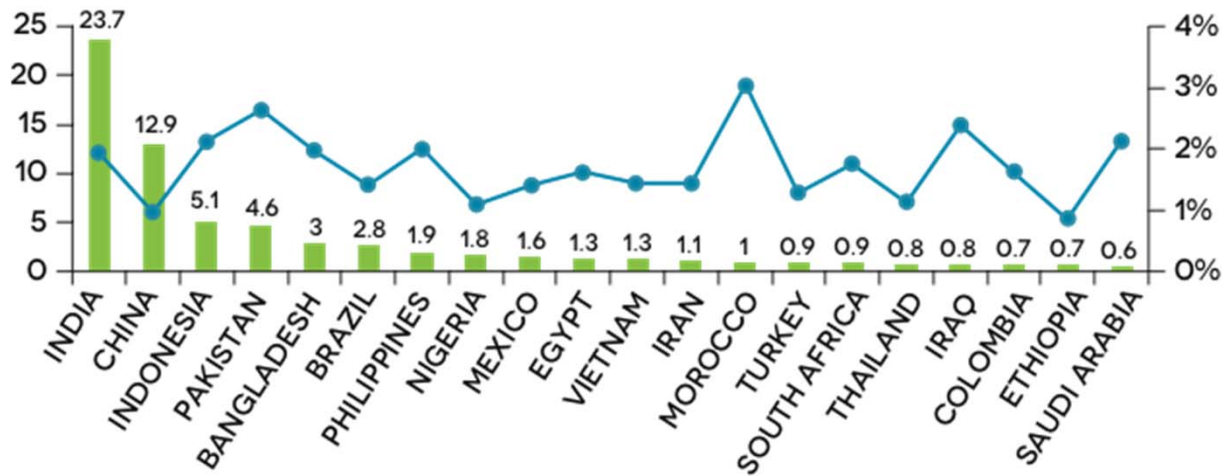


SOURCE OF NON-SOLID FUEL ACCESS DEFICIT, 2010

SOURCE: WB, WHO

NOTE: ACCESS NUMBERS IN MILLIONS OF PEOPLE. EA = EASTERN ASIA; SEA = SOUTH-EASTERN ASIA; SA = SOUTHERN ASIA; SSA = SUB-SAHARAN AFRICA; OTH = OTHERS.

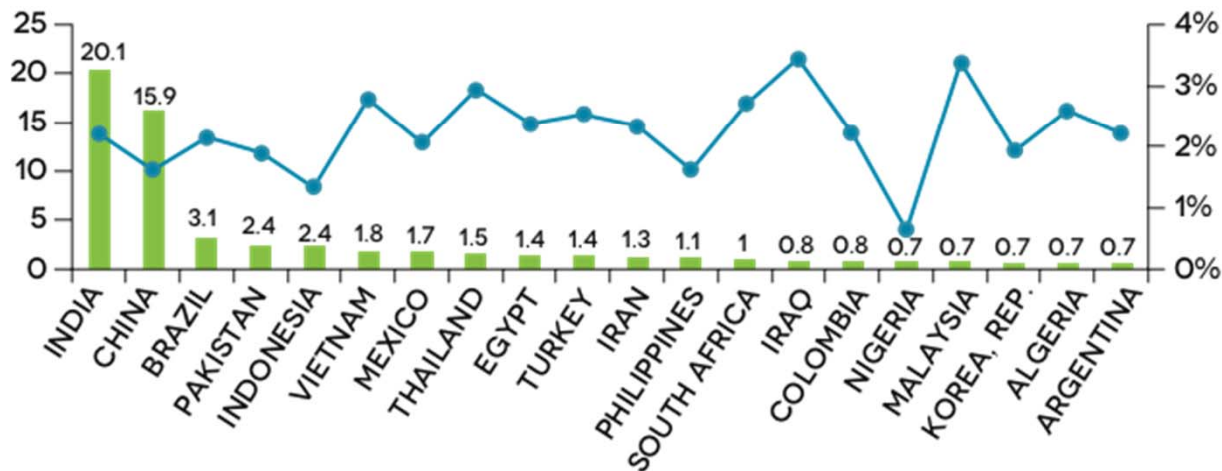
# Some countries succeeded in providing access to 2%-4% of their populations annually



THE 20 COUNTRIES WITH THE GREATEST ANNUAL INCREASES IN ACCESS TO ELECTRICITY, 1990-2010

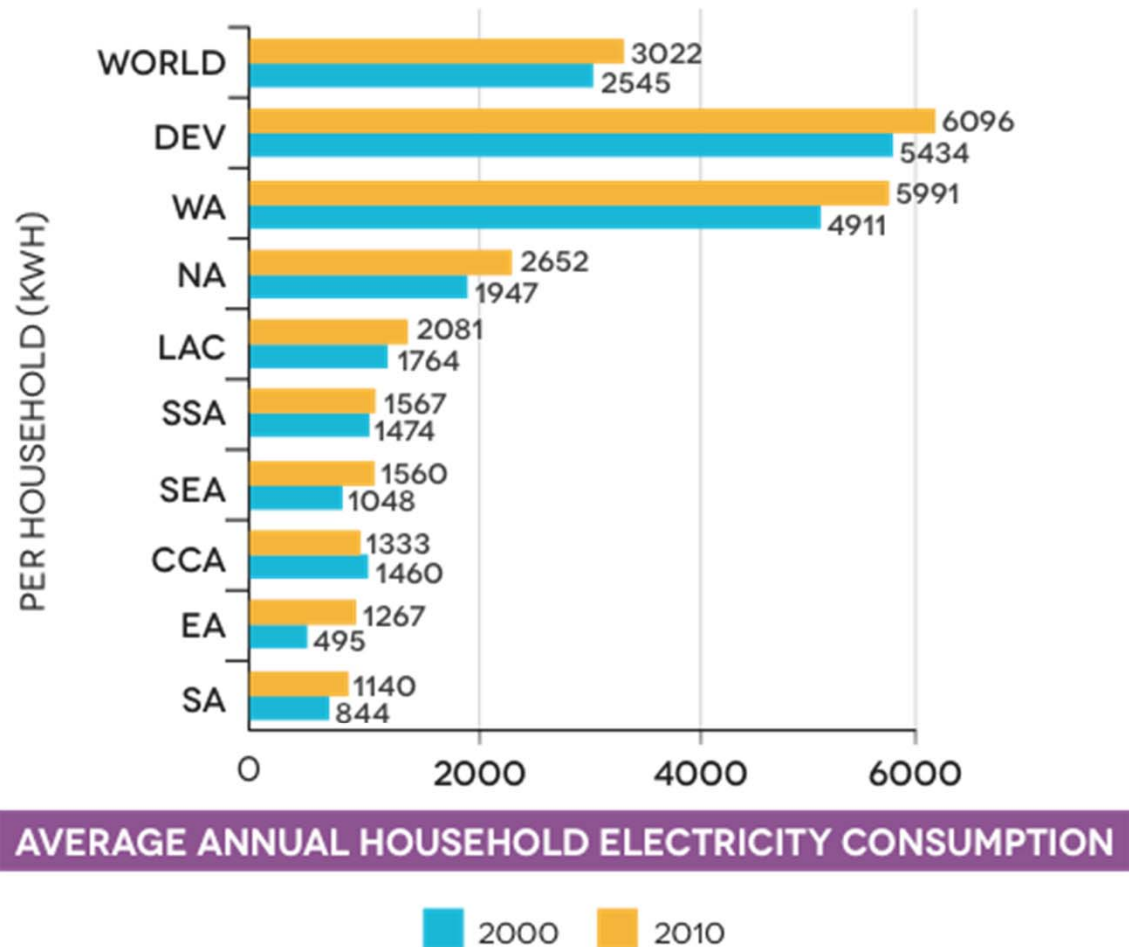
■ ANNUAL INCREMENTAL ACCESS (MILLION PEOPLE)  
 ● ANNUAL GROWTH IN ACCESS (%)

SOURCE: WORLD BANK GLOBAL ELECTRIFICATION DATABASE, 2012.



THE 20 COUNTRIES WITH THE GREATEST ANNUAL INCREASES IN ACCESS TO NON-SOLID FUELS, 1990-2010

# While average residential electricity consumption varies hugely across regions greatly affecting quality of access



SOURCE: IEA

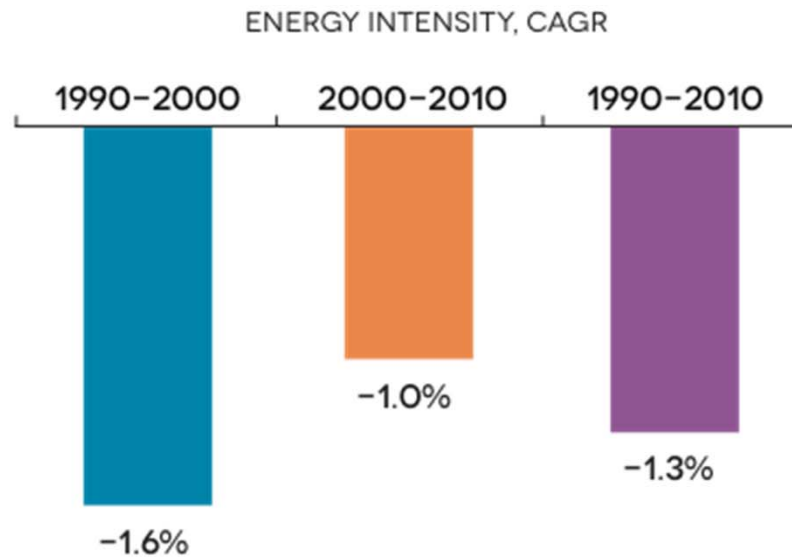
NOTE: CCA = CAUCASUS AND CENTRAL ASIA; DEV = DEVELOPED COUNTRIES; EA = EASTERN ASIA; LAC = LATIN AMERICA AND CARIBBEAN; NA = NORTHERN AFRICA; SA = SOUTHERN ASIA; SEA = SOUTHEASTERN ASIA; SSA = SUB-SAHARAN AFRICA; WA = WESTERN ASIA.





# ENERGY EFFICIENCY

# Steady but decelerating gains in energy intensity globally

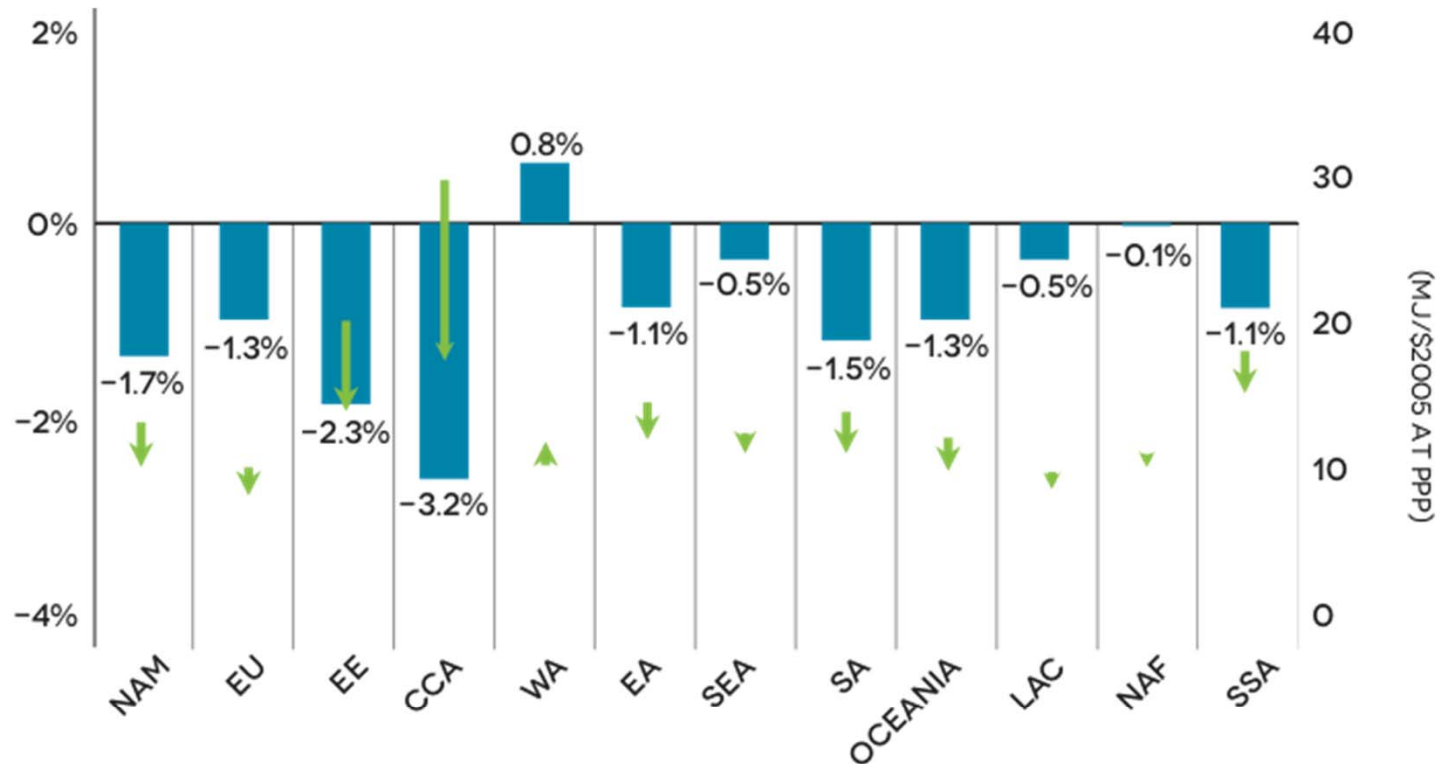


**RATE OF IMPROVEMENT IN GLOBAL ENERGY INTENSITY, 1990-2010 (PPP TERMS)**

**SOURCE:** WB, WHO, IEA

**NOTE:** PPP = PURCHASING POWER PARITY; CAGR = COMPOUND ANNUAL GROWTH RATE. "ADJUSTED ENERGY INTENSITY" IS A MEASURE DERIVED FROM THE DIVISIA DECOMPOSITION METHOD THAT CONTROLS FOR SHIFTS IN THE ACTIVITY LEVEL AND STRUCTURE OF THE ECONOMY.

# Rate of improvement of energy intensity varies substantially across regions



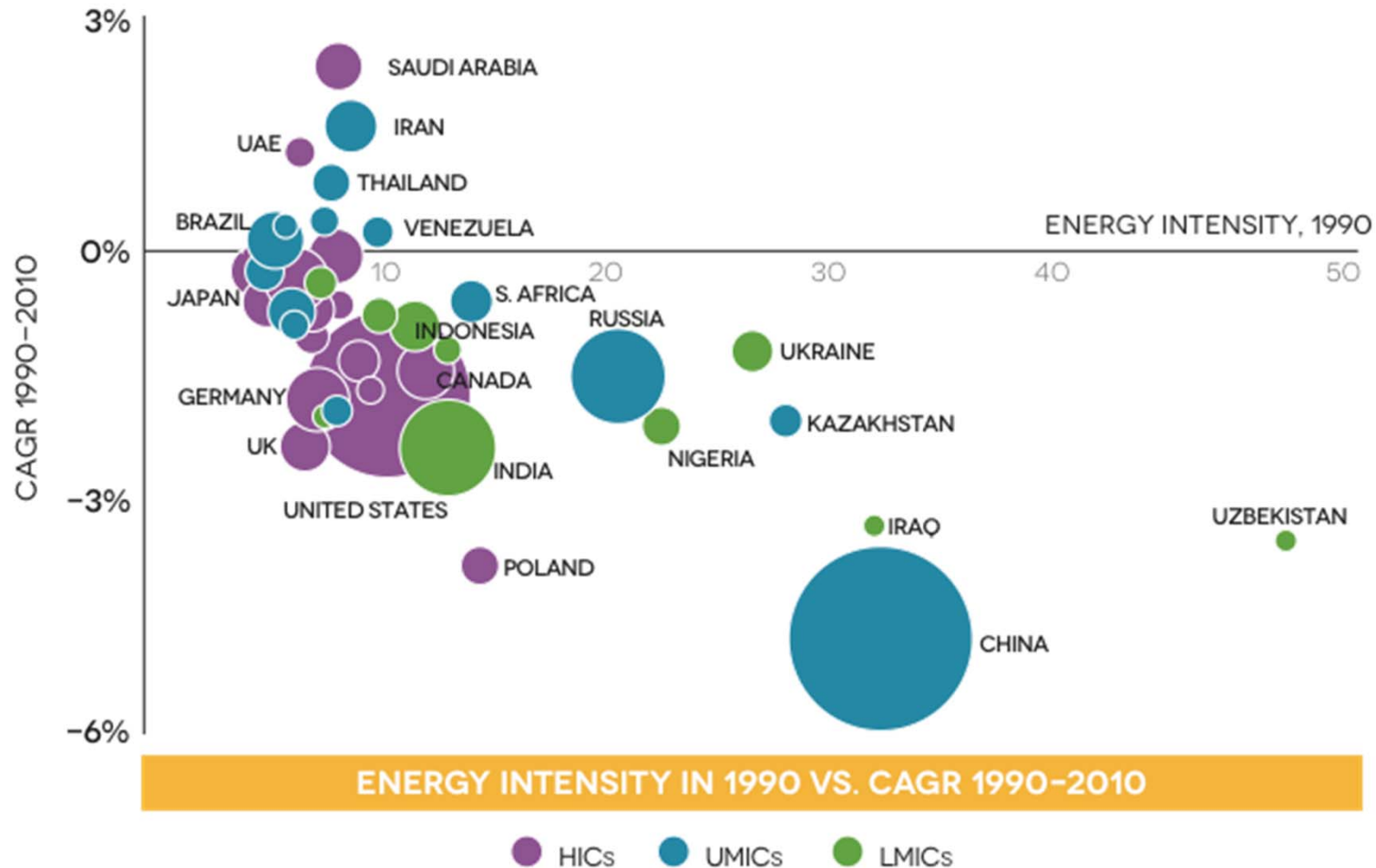
ENERGY INTENSITY TRENDS BY REGION, 1990-2010

■ CAGR 1990-2010 (LEFT)    ↓ EI IN 1990 (RIGHT)    ▲ EI IN 2010 (RIGHT)

SOURCE: IEA, WDI

NOTE: NAM = NORTHERN AMERICA; EU = EUROPE; EE = EASTERN EUROPE; CCA = CAUCASUS AND CENTRAL ASIA; WA = WESTERN ASIA; EA = EASTERN ASIA; SEA = SOUTH-EASTERN ASIA; SA = SOUTHERN ASIA; LAC = LATIN AMERICA AND CARIBBEAN; NAF = NORTHERN AFRICA; SSA = SUB-SAHARAN AFRICA.

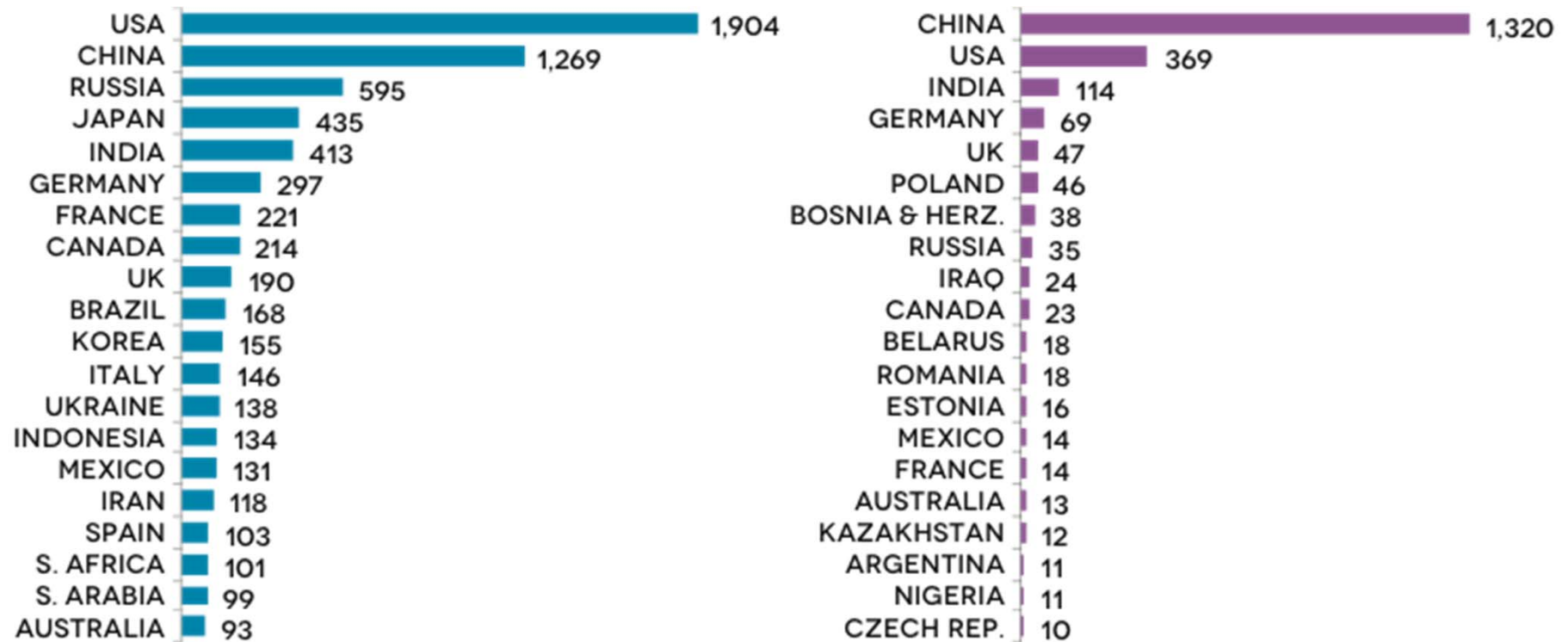
# Most rapid progress on energy intensity among countries that started out with highest energy intensities in 1990



SOURCE: WDI, IEA 2012A.

NOTE: BUBBLE SIZE REPRESENTS THE VOLUME OF PRIMARY ENERGY SUPPLY IN 2010. CAGR = COMPOUND ANNUAL GROWTH RATE; HICS = HIGH-INCOME COUNTRIES; LMICS = LOWER-MIDDLE-INCOME COUNTRIES; UMICs = UPPER-MIDDLE-INCOME COUNTRIES.

# China saved as much energy as it consumed over the last 20 years, yet intensity remains above global average



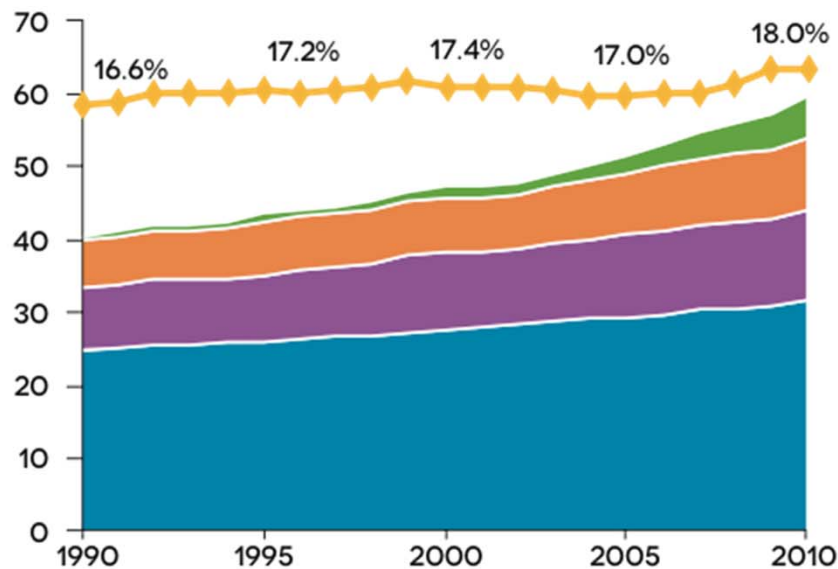
**LARGEST CUMULATIVE CONSUMERS OF PRIMARY ENERGY, AND CUMULATIVE ENERGY SAVINGS AS A RESULT OF REDUCTIONS IN ENERGY INTENSITY, 1990-2010 (EXAJOULES)**

**SOURCE:** BASED ON WORLD DEVELOPMENT INDICATORS, WORLD BANK; IEA 2012A; UN ENERGY STATISTICS DATABASE.  
**NOTE:** BOSNIA & = BOSNIA & HERZEGOVINA.



# RENEWABLE ENERGY

# Overall share of renewable energy has remained quite flat, albeit some sources grew exponentially from a small base

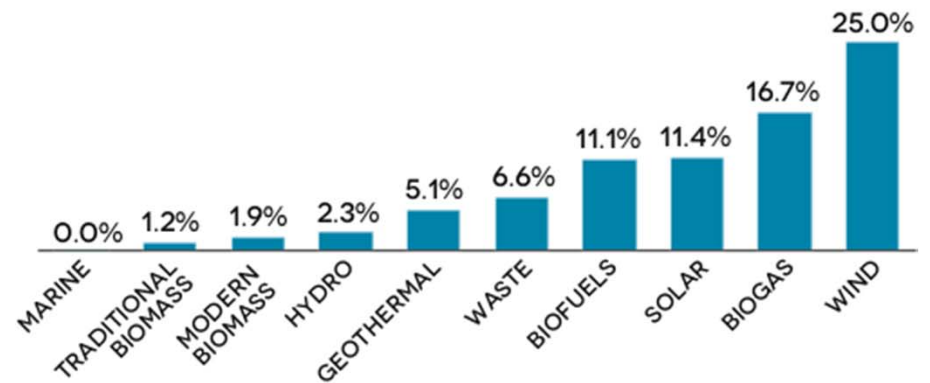


WORLD CONSUMPTION OF RENEWABLE ENERGY (EXAJOULES) AND SHARE OF RENEWABLE ENERGY IN TFEC (%)

■ OTHER RE    ■ HYDRO    ■ MODERN BIOMASS  
◆ RE SHARE IN TFEC    ■ TRADITIONAL BIOMASS

SOURCE: IEA 2012A.

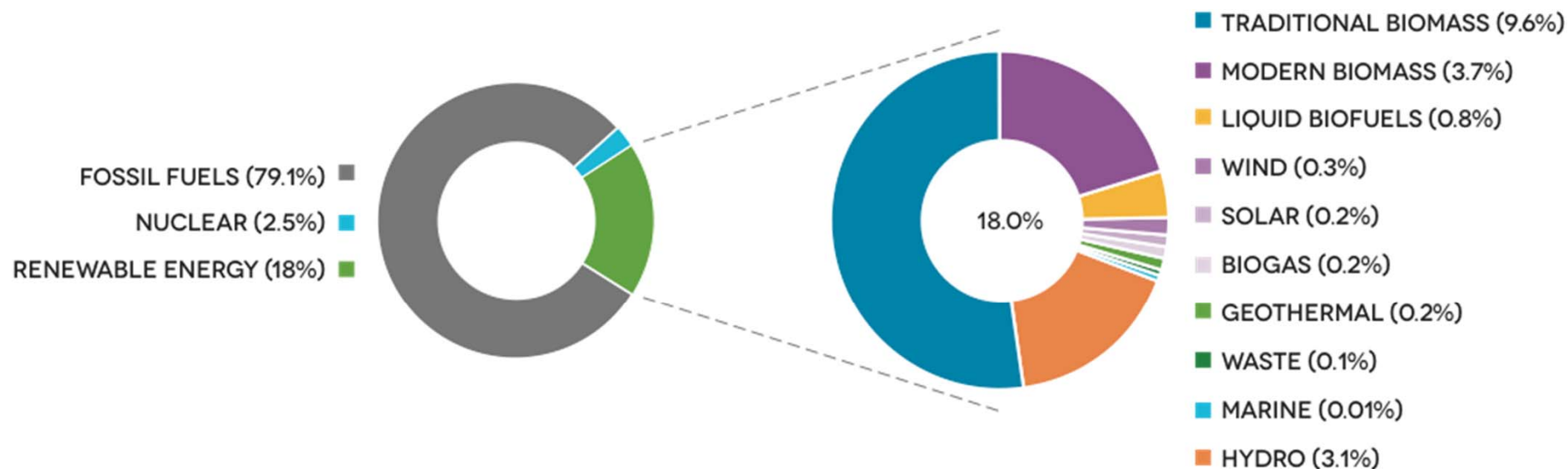
NOTE: TFEC = TOTAL FINAL ENERGY CONSUMPTION; RE = RENEWABLE ENERGY.



COMPOUND ANNUAL GROWTH RATES (CAGRS) BY RENEWABLE ENERGY SOURCE, 1990-2010

SOURCE: IEA 2012A.

# Traditional biomass accounts for over half of renewable energy, mainly for heating and cooking

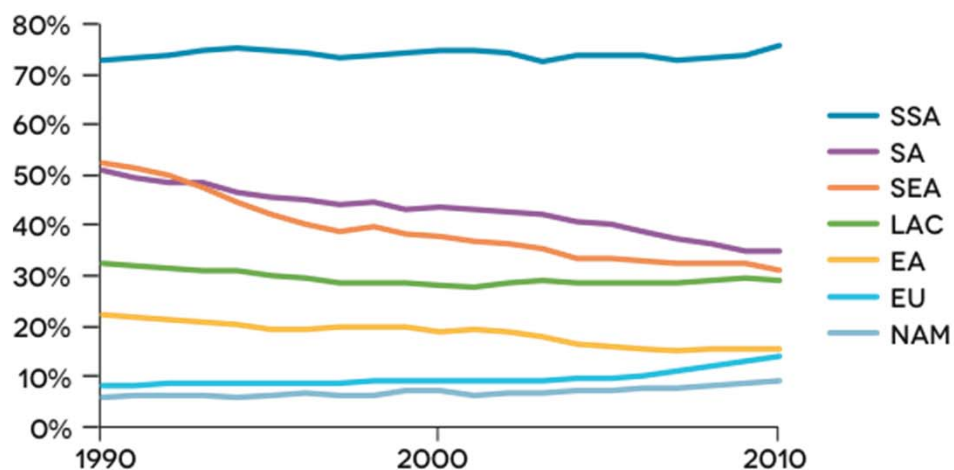


SHARE OF RENEWABLE ENERGY IN GLOBAL TFC, 2010

SOURCE: IEA



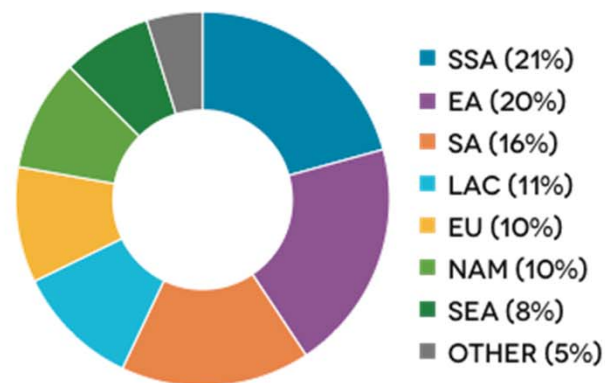
# Less developed regions show higher (though declining) renewable energy shares – and vice versa



**EVOLVING RENEWABLE ENERGY SHARE BY REGION, 1990–2010 (PERCENTAGE OF TOTAL FINAL ENERGY CONSUMPTION)**

SOURCE: IEA 2012A.

NOTE: TFEC = TOTAL FINAL ENERGY CONSUMPTION; RE = RENEWABLE ENERGY. CCA = CAUCASUS AND CENTRAL ASIA; EA = EASTERN ASIA; LAC = LATIN AMERICA AND CARIBBEAN; NAF = NORTHERN AFRICA; SEA = SOUTH-EASTERN ASIA; SA = SOUTHERN ASIA; SSA = SUB-SAHARAN AFRICA; WA = WESTERN ASIA; EU = EUROPE.

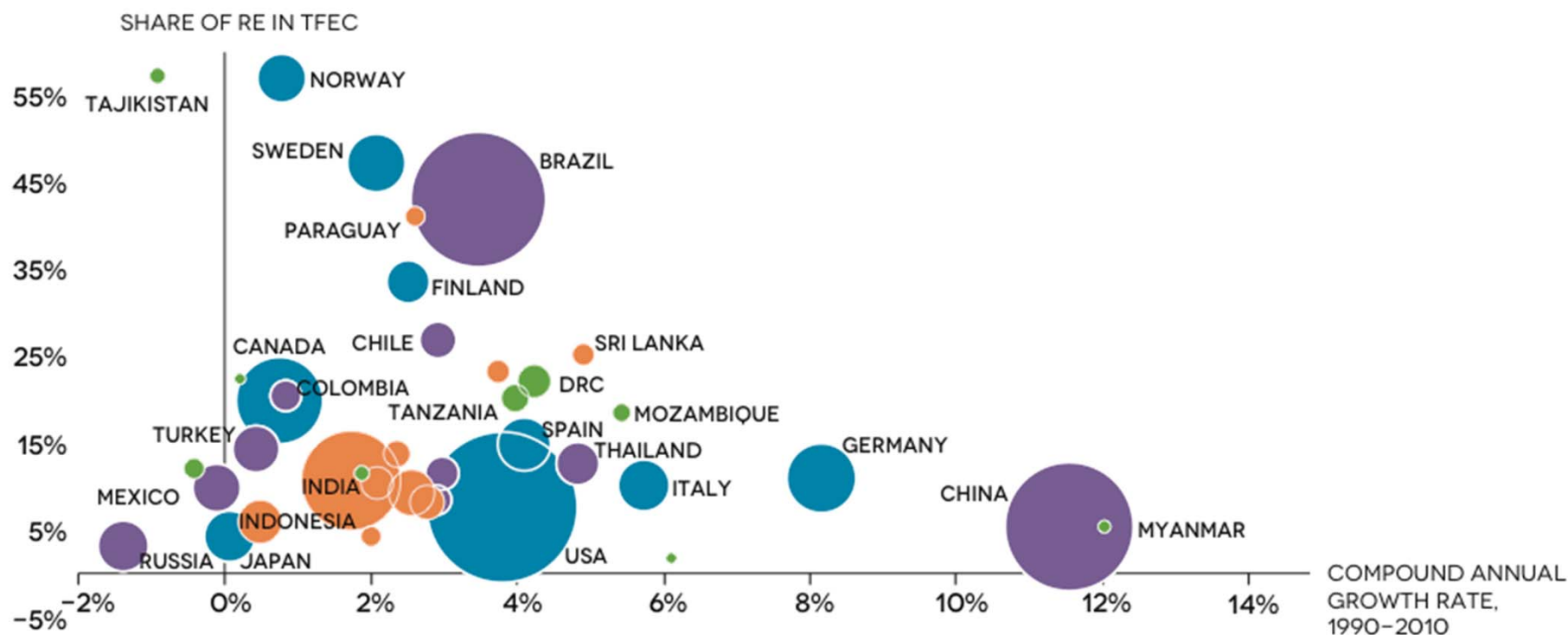


**REGIONAL CONTRIBUTIONS TO GLOBAL RENEWABLE ENERGY 2010 (PERCENTAGE CONTRIBUTION TO THE GLOBAL SHARE OF RENEWABLE ENERGY IN TFEC)**

SOURCE: IEA 2012A.

NOTE: CCA = CAUCASUS AND CENTRAL ASIA; EA = EASTERN ASIA; LAC = LATIN AMERICA AND CARIBBEAN; NAF = NORTHERN AFRICA; SEA = SOUTH-EASTERN ASIA; SA = SOUTHERN ASIA; SSA = SUB-SAHARAN AFRICA; WA = WESTERN ASIA; EU = EUROPE; OTHER = ALL OTHER REGIONS.

# Countries with highest renewable shares reach 50% mark (excluding traditional biomass)



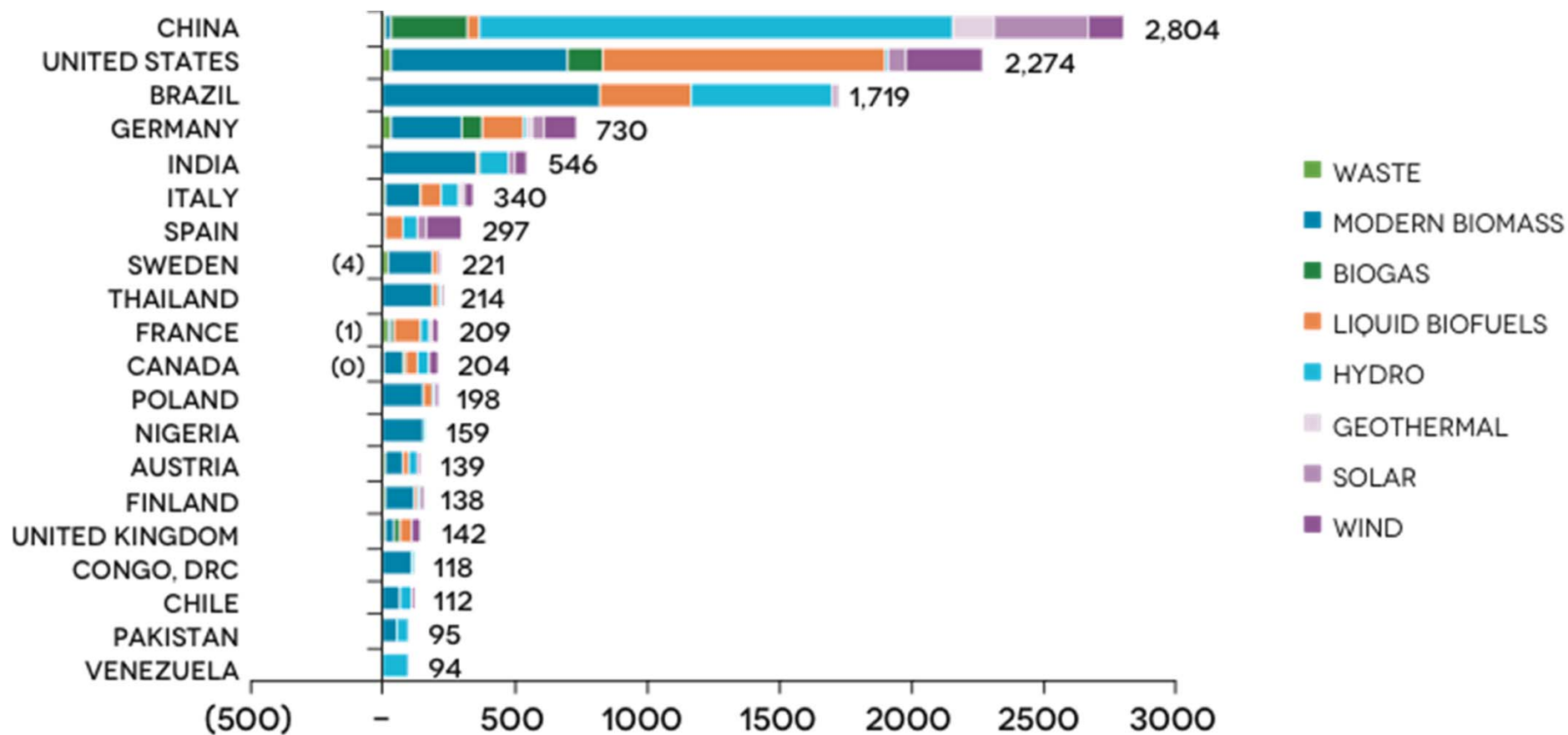
SHARE OF RENEWABLE ENERGY IN TOTAL FINAL ENERGY CONSUMPTION AND COMPOUND ANNUAL GROWTH RATE IN CONSUMPTION OF RENEWABLE ENERGY, 2000-10

● HICs ● UMICs ● LMICs ● LICs

SOURCE: WDI, IEA 2012A.

NOTE: TFEC = TOTAL FINAL ENERGY CONSUMPTION; CAGR = COMPOUND ANNUAL GROWTH RATE; RE = RENEWABLE ENERGY. FIGURE EXCLUDES TRADITIONAL BIOMASS, BUT INCLUDES THE USE OF MODERN BIOMASS. CONGO AND TANZANIA APPEAR DUE TO THEIR HIGH USE OF MODERN BIOMASS IN THE INDUSTRIAL SECTOR. NEGATIVE CAGRS SHOWN DENOTE A REDUCTION IN THE USE OF NON-TRADITIONAL SOLID BIOMASS (MOST NOTABLY IN INDUSTRY) IN TURKEY, MEXICO, AND INDONESIA. UNLABELED BUBBLES REPRESENT COUNTRIES WITH A LOW SHARE OF RE IN TFEC AND A LOW CAGR.

# Largest increases in renewable energy consumption registered by OECD and some emerging countries



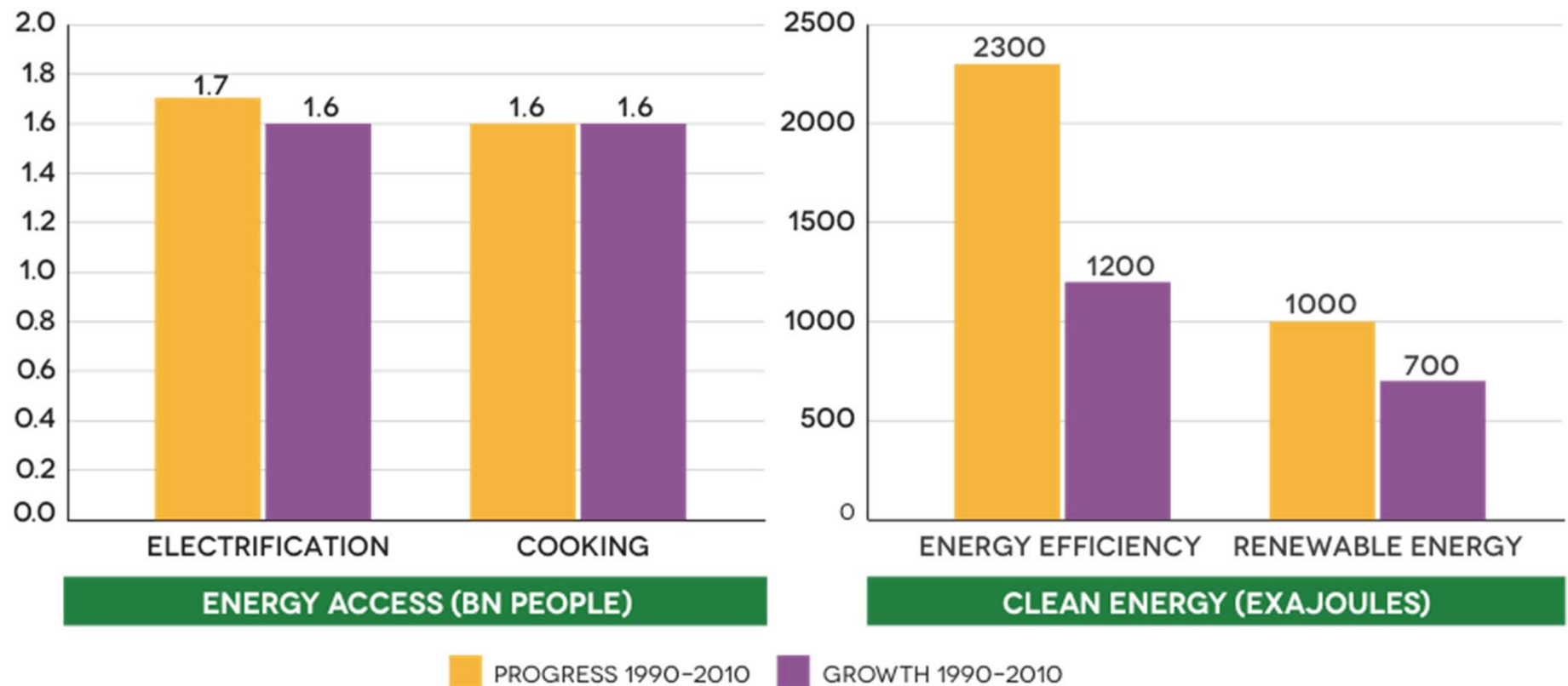
SOURCE: IEA 2012A.

NOTE: "INCREMENTAL CONSUMPTION" INDICATES ADDITIONAL CONSUMPTION OF RENEWABLE ENERGY OVER AND ABOVE THE LEVEL OF CONSUMPTION IN 1990. DRC = DEMOCRATIC REPUBLIC OF CONGO.



# SCALE OF CHALLENGE

# Progress of the last 20 years has only kept slightly ahead of huge growth in population and energy demand

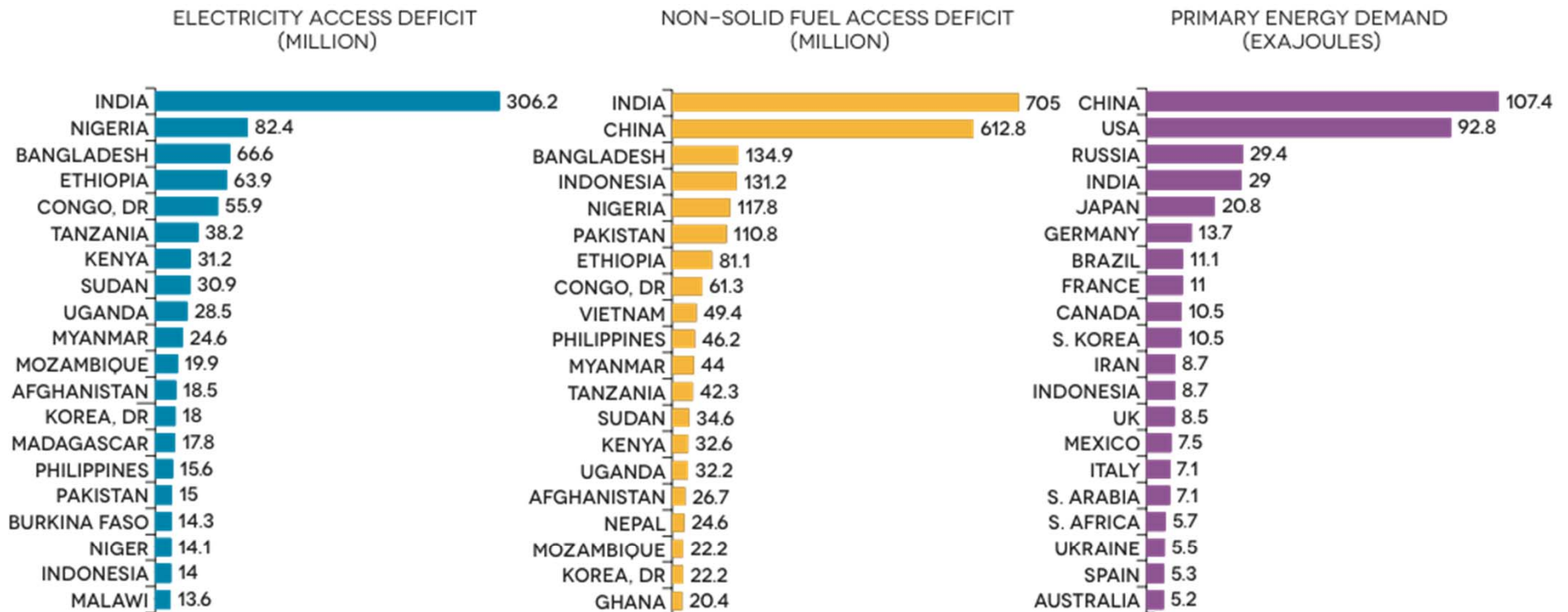


SOURCE: WB, WHO, IEA

## Starting point for SE4ALL goals can be established on this basis

Percent	Universal access to modern energy services		Doubling global rate of improvement of energy efficiency	Doubling share of renewable energy in global energy mix
	Proxy indicator	Percentage of population with electricity access	Percentage of population with primary reliance on non-solid fuels	Rate of improvement in energy intensity
1990	76	47	-1.3	16.6
<b>2010</b>	<b>83</b>	<b>59</b>		<b>18.0</b>
2030	100	100	-2.6	36.0

# “High impact” countries account for 65-80% of global challenge and hold key to meeting global targets

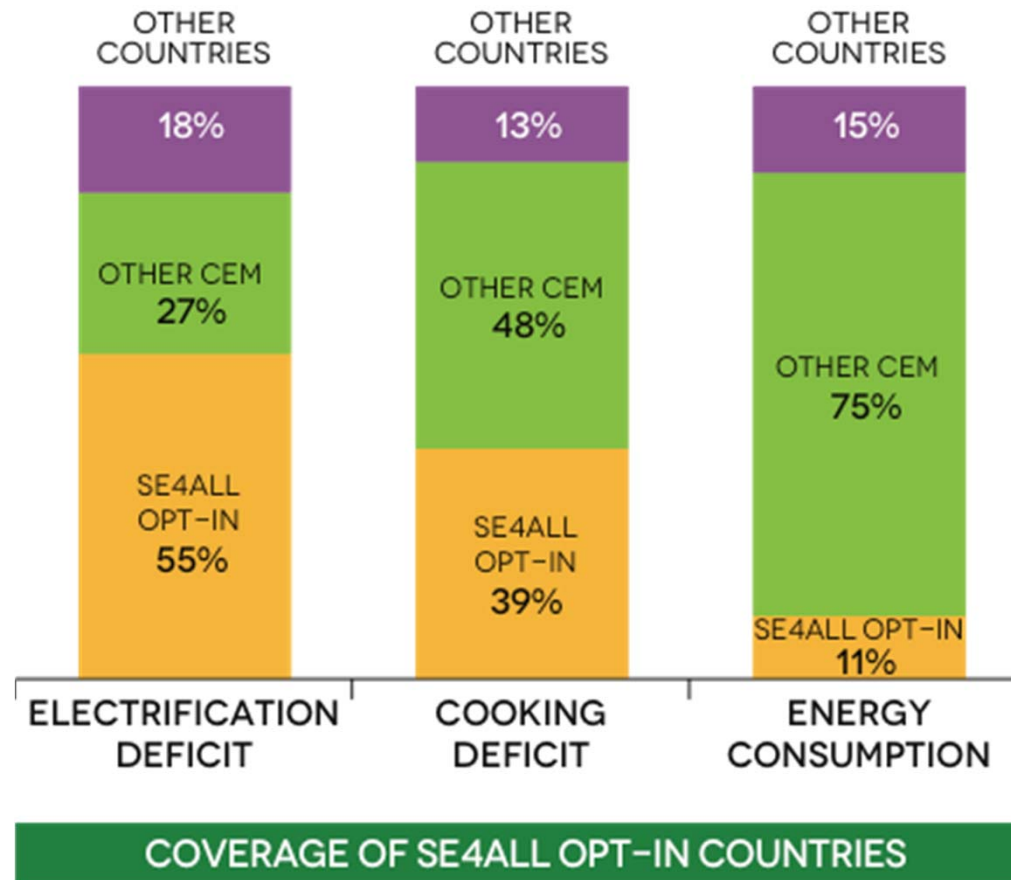


## OVERVIEW OF HIGH-IMPACT COUNTRIES

SOURCE: WB, WHO, IEA

NOTE: DR = "DEMOCRATIC REPUBLIC OF."

# SE4ALL opt-in countries account for about half access deficit, but barely 10% of global energy consumption



SOURCE: WB, WHO, IEA.

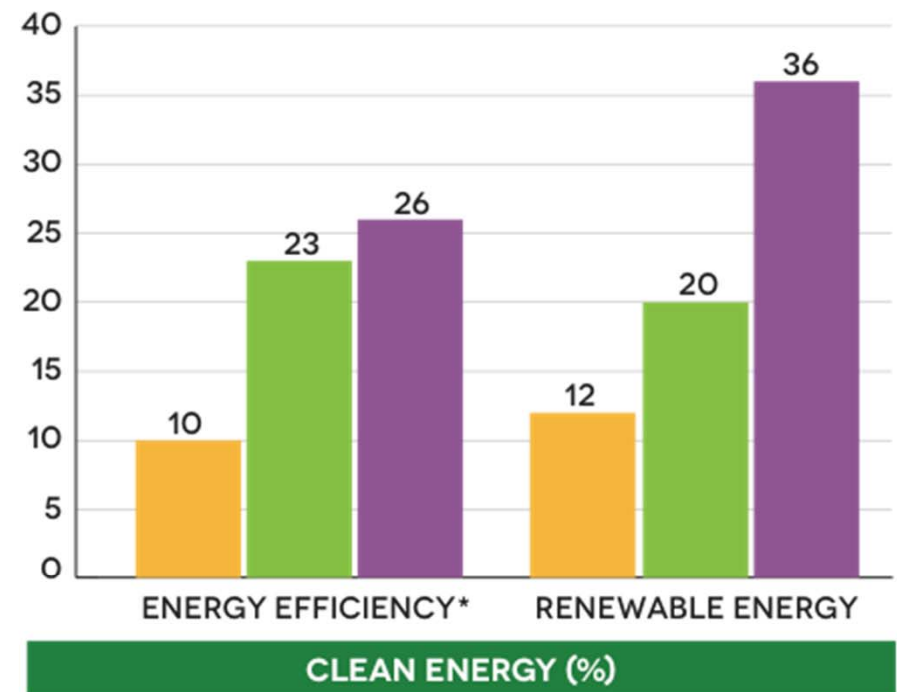
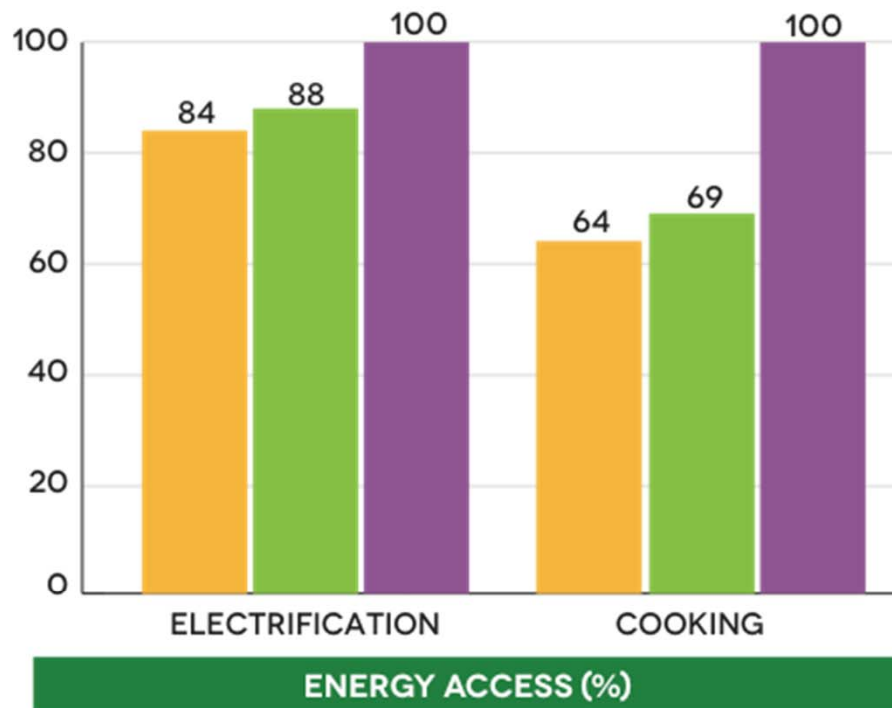


## Top 20 “fast moving” countries substantially outperform global averages on rate of improvement

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Average annual rate of improvement (%)	Global average	Fast moving countries
Electrification	1.2	2.5 to 3.7
Non-solid fuel use	1.1	2.2 to 4.0
Energy intensity	1.3	3.9 to 11.9
Renewable energy (excluding traditional biomass)	3.0	7.0 to 18.2

# Global models show that business as usual falls well short of where we need to be by 2030



■ BUSINESS AS USUAL (GEA BASELINE) ■ BUSINESS AS USUAL (IEA NPS) ■ 2030 OBJECTIVE

SOURCE: IEA, IIASA

\* ENERGY EFFICIENCY PERCENTAGES ARE MULTIPLIED BY 10 TO MAKE UNITS CONSISTENT WITH RENEWABLE ENERGY

## Global models indicate achievement of SE4ALL objectives has benign impact on climate change

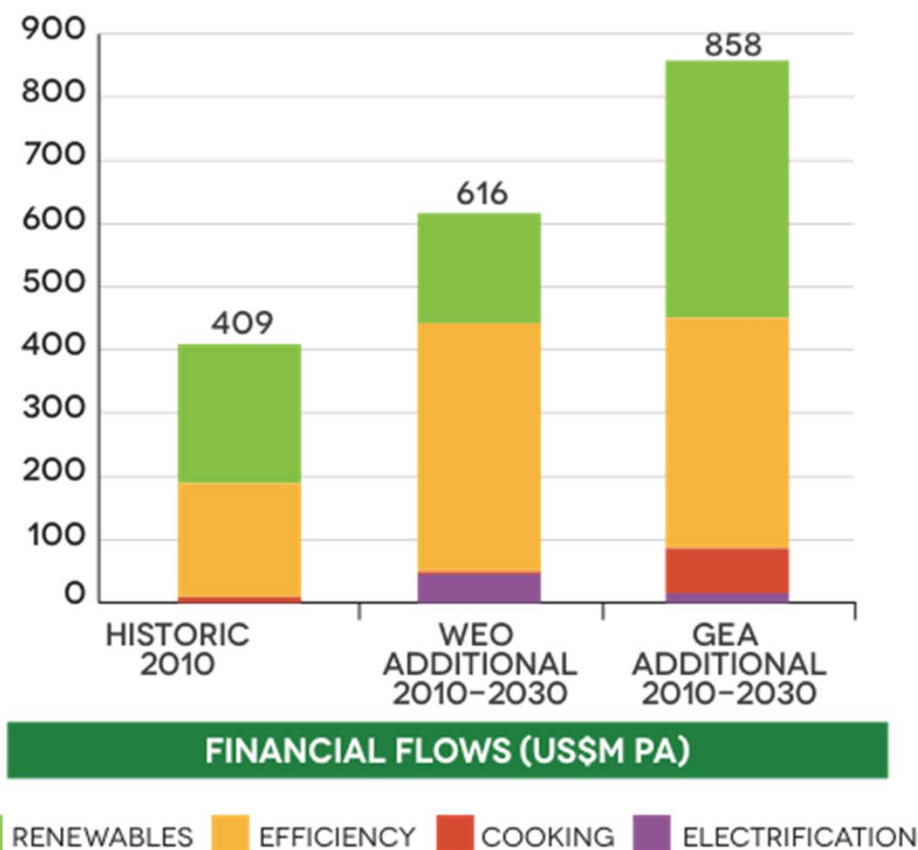
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- Energy efficiency and renewable energy objectives if jointly achieved significantly increase probability of limiting global warming to two degrees Celsius
- Achievement of universal access objective has negligible impact on global warming
  - Universal electrification with mix of conventional and renewable energy adds less than one percent to carbon dioxide emissions
  - Universal modern cooking expected to reduce renewable energy share by just two percentage points due to use of non-solid fuels

# Achieving objectives will take bold policy action aimed at doubling or tripling financial flows

## Bold policy actions

- Phase out untargeted fossil fuel subsidies
- Design carefully targeted subsidies for access
- Introduce price signals for local and global environmental impacts
- Adopt stringent technology standards for efficiency



SOURCE: IEA, IIASA

# Better data and better standards for better results – all tracking indicators can be significantly improved

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## ➤ **Electrification**

- Some over-estimation due to inability to capture quality and reliability of service as well as services supported – need for multi-tier framework

## ➤ **Cooking**

- Some under-estimation due to inability to capture whether improved cookstoves are being used – need for multi-tier framework

## ➤ **Energy efficiency**

- Some mis-estimation due to inability to drill down to physical indicators at sectoral, sub-sectoral and process levels – need for better data

## ➤ **Renewable energy**

- Some over-estimation due to inability to capture whether or not (traditional biomass) being used sustainably – need for protocols



Global Tracking Framework | May 28, 2013

The SE4ALL Global Tracking Framework full report, overview paper, executive summary, powerpoint presentation and associated datasets can be downloaded from the following website:

[www.worldbank.org/se4all](http://www.worldbank.org/se4all)

**Funding from ESMAP and DFID is gratefully acknowledged**

COORDINATORS

ESMAP



International Energy Agency

