



# Synergies between Renewable Energy & Energy Efficiency

REN21 Renewables 2015 Global Status Report:

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**COPENHAGEN CENTRE  
ON ENERGY EFFICIENCY**  
SE4ALL EE HUB

# Overview

**The Copenhagen Centre on Energy Efficiency** (C2E2) is a research and advisory institution dedicated to accelerating the uptake of energy efficiency policies, programmes and actions globally.

C2E2 serves as the **Energy Efficiency Hub of the Sustainable Energy for All** (SE4ALL) Initiative. The Centre's prime responsibility is to support SE4ALL's objective of doubling the global rate of energy efficiency improvement by 2030.

## Vision:

*The Centre is internationally recognised as a leading research and advisory institution on energy efficiency in close partnership with global, national and local stakeholders.*

## Objectives:

- Accelerated adoption of energy efficiency policies, programmes and actions in countries.
- Progress towards achieving the SE4ALL objective of doubling the global rate of energy efficiency improvement by 2030.

# Sustainable Energy for All



SUSTAINABLE  
ENERGY FOR ALL

## One Goal:

# Achieving Sustainable Energy for All by 2030

## Three Objectives:



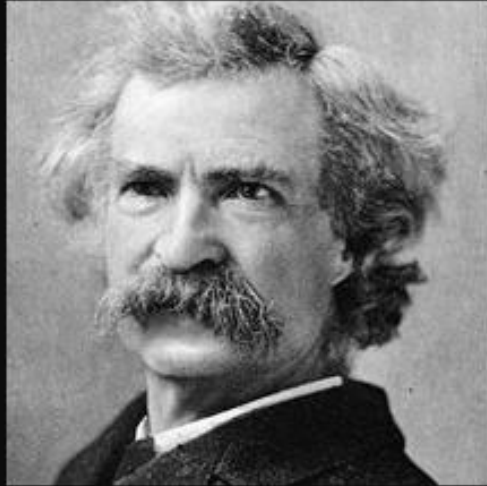
ENSURING  
*universal access*  
TO MODERN ENERGY  
SERVICES.



DOUBLING THE GLOBAL  
RATE OF IMPROVEMENT IN  
*energy  
efficiency.*



DOUBLING THE SHARE OF  
*renewable energy*  
IN THE GLOBAL  
ENERGY MIX.



Synergy - the bonus that is achieved when things work together harmoniously.

~ Mark Twain

AZ QUOTES

SYNERGY

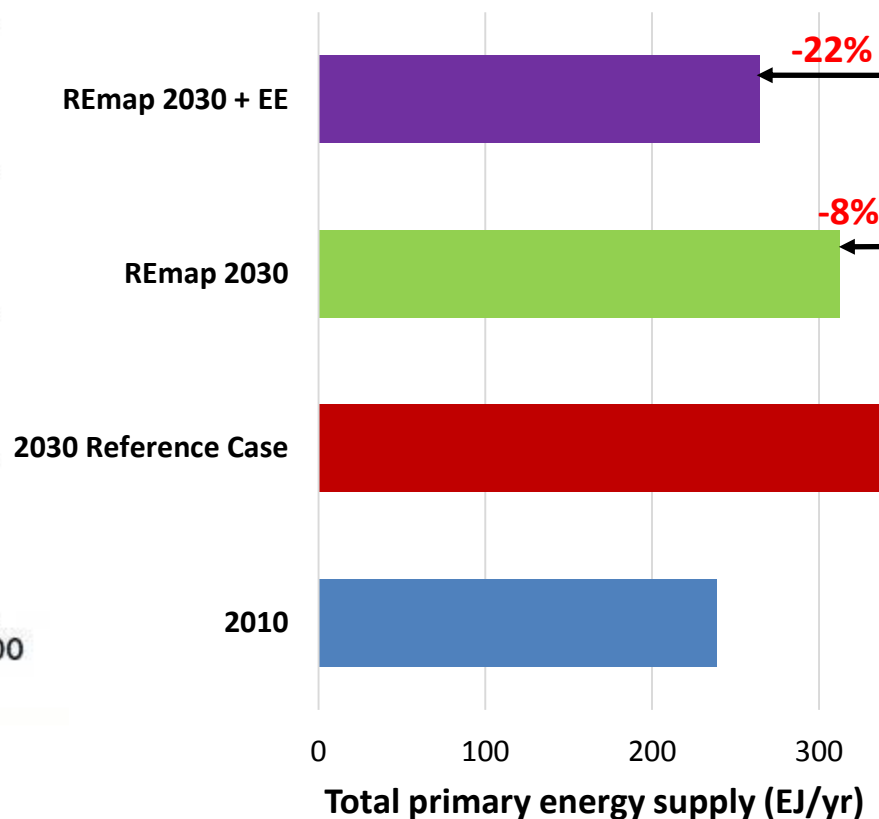
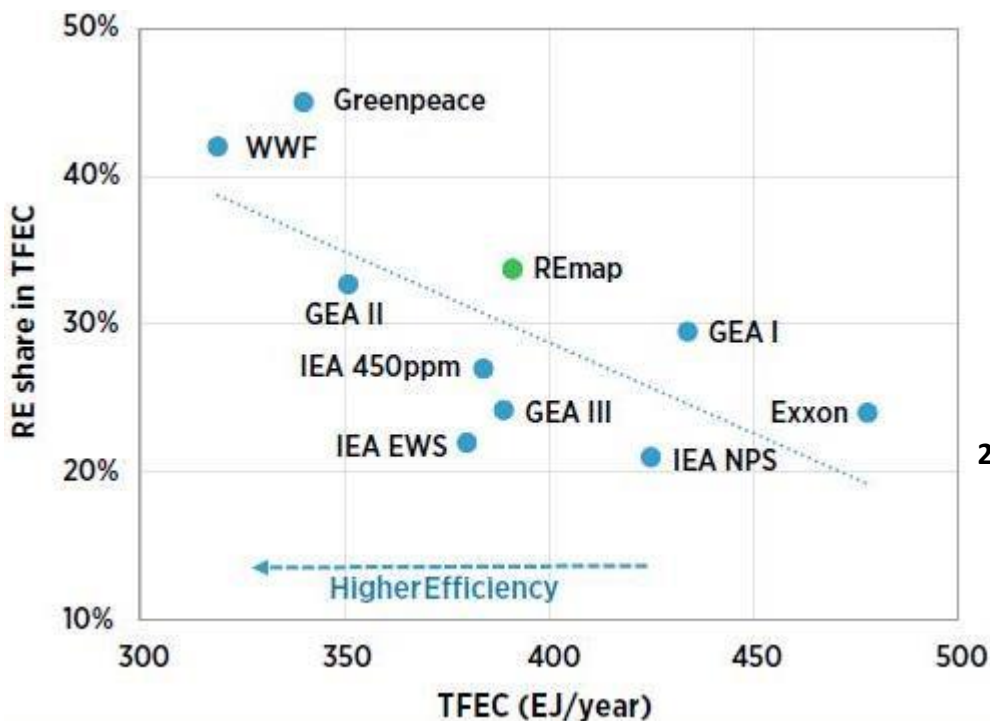
$$1 + 1 = 3$$

# C2E2/IRENA Quantification of EE/RE Synergies

Analysis	Objective	RE options	EE options	Contribution to SE4ALL objectives	Outputs/ indicators
1	Potential of REmap Options with business-as-usual efficiency improvements	Yes	No	RE objective	RE share TFEC
2	Potential of energy efficiency improvement with business-as-usual RE deployment	No	Yes	EE objective	Energy intensity TPES
3	Potentials of REmap options and energy efficiency improvements, their synergy and trade-offs	Yes	Yes	RE and EE objectives	RE share TFEC & Energy intensity TPES



# EE-RE Synergies Summary Results



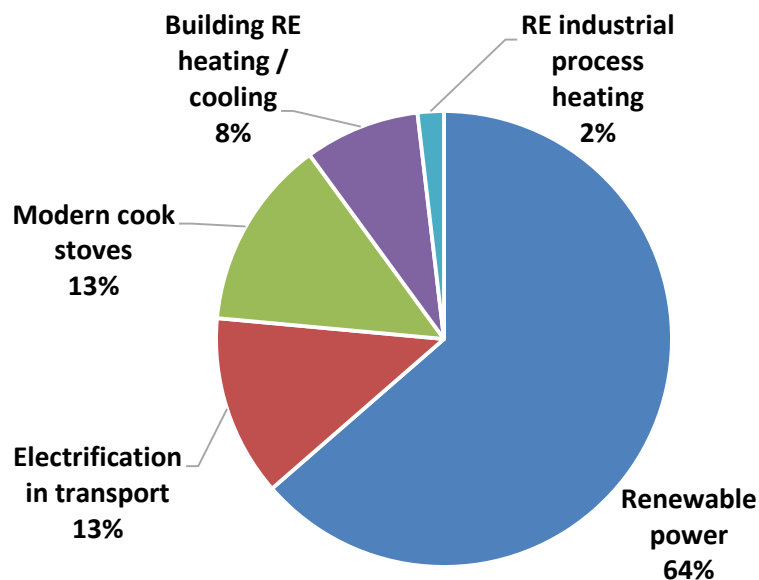
'The less energy we consume, the greater the renewable energy share can be' - IRENA REmap 2014

Combined potential of EE and RE reduces TPES by 22% in 2030  
Two-thirds of the savings are from EE measures

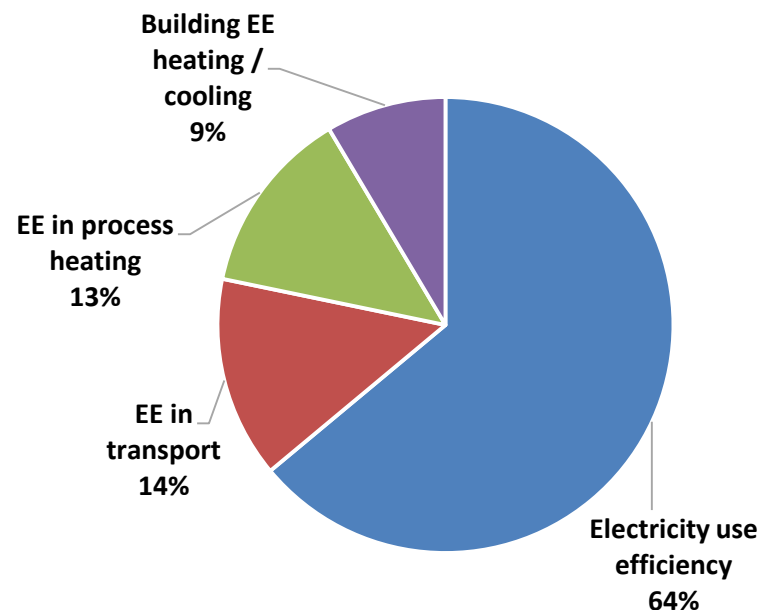


# EE-RE Break-down of Energy Savings

## RE options



## EE measures



Efficiency measures to reduce power demand and renewable power account for two-thirds of primary energy savings

# Energy Efficiency: Renewable Energy's Twin Pillar - REN21 GSR

As energy services are delivered more efficiently, renewables can more quickly become an effective and significant contributor to the primary energy supply, reduce the peak electricity demand, ease transmission losses and bottlenecks

## SYNERGIES

for greater system benefits

EE building systems & designs, combined with on-site RE generation, reduce end-use energy demand, electrical grid congestion and losses, and the monetary and energy expenditures associated with fuel transportation.

for greater RE share in the energy mix

With lower end-use energy requirements, the opportunity increases for renewable energy sources of low energy density to meet full energy-service needs

for greater investment in renewables and efficiency

Improvements in end-use EE reduce the cost of delivering end-use services by RE, and the money saved through efficiency can help finance additional EE improvements and/or deployment of RE technologies



# Key Trends on Energy Efficiency - REN21 GSR

<b>Global level</b>		Energy intensity at the global level decreased at a compounded annual rate averaging about 1.25% between 1990 and 2013, and most world regions achieved improvements in aggregated energy intensity during this period
<b>SECTORS</b>	<b>Buildings &amp; Appliances</b>	Growing number of NZEBs in different regions, including the progress for public, large and existing buildings. In EU NZEBs tripled between 2000 and 2012 Significant EE improvements for appliances: refrigerators -50%; TV - 32-71%; lighting -90% (LED),
	<b>Transport</b>	Fuel economy improvements in private vehicles, increased penetration of electric (EV) and hybrid (HEV) vehicles, and shifts to more sustainable modes of passenger travel Substantial decrease in EI globally and in several regions between 2000 & 2013
	<b>Industry</b>	Global & regional EI declined steadily between 2000 & 2013 Expanded implementation of EnMS at industrial facilities - more than 7,300 sites worldwide between 2011 and May 2014

# Key Policy Developments in EE - REN21 GSR

## Targets

EU, China, India, South Africa, Thailand, the United States, and all ECOWASii countries in Africa

## Regulations

British Columbia - more stringent EE requirements for SF houses, BE and LT - new building energy performance requirements, UK - obligation scheme, VN - building code with EE

## Standards & Labelling

Products: PL, JP, KR - expanded S&L coverage to all energy consuming products, DE - 'TOP 100 – Eco-label for Climate-Relevant Products', IR & VN - S&L for EE cookers & stoves  
Transport: US, CA - fuel economy standards by 2025, MX - 1st standard, CL - 1st FE labelling, MU - 1st FE feebate system  
Industry: standards for electric motors used in industrial applications had been introduced in 44 countries by 2013, including Brazil, China, South Korea, and the United States

## Incentives

revolving funds for EE in buildings (IT, NL), green investment scheme (CZ), grant programmes (PL), tax credits & rebates for EE vehicles (PL, US, FR), subsidies for industrial facilities (DE, TR, EU - EnMS)

## RE+EE Policies

- RE & EE targets in parallel on an economy-wide basis (e.g. plans: EU, IN, JP)
- integrating RE & EE at the economy-wide level (e.g. nZE: EU MS, SZ, US, CA, AU)
- requiring the joint implementation of RE & EE (e.g. incentives: DE, CL, LX, IT)

# Thank you for your attention!



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# Supplementary slides