Renewable Energy and Transport

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REN21

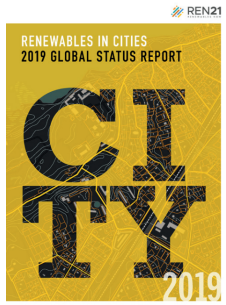
Workshop: Deep Transition and Integration of Power and Transport Systems(APEC project EWG 10 2018A)
NREL Office, Washington DC, 14-15 January 2020

REN21 is an international community of passionate actors dedicated to building a sustainable renewable energy future.

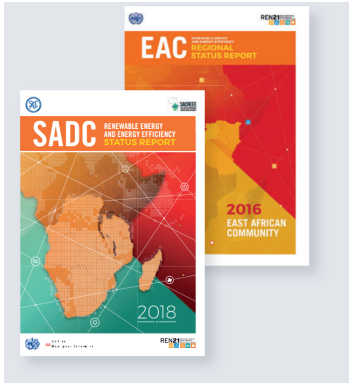
Who we are…

What we do…

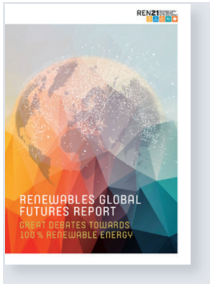
Global Status Report: yearly publication since 2005



Renewables in Cities Status Report:



Regional Reports



Global Futures Reports

Thematic Reports

REN21 ACADEMY

International Renewable Energy Conferences

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Taking a holistic approach to energy and transport

- Ambitious and binding targets across sectors
- Backed up by supporting policies
- Sector coupling
- Avoid-Shift-Improve

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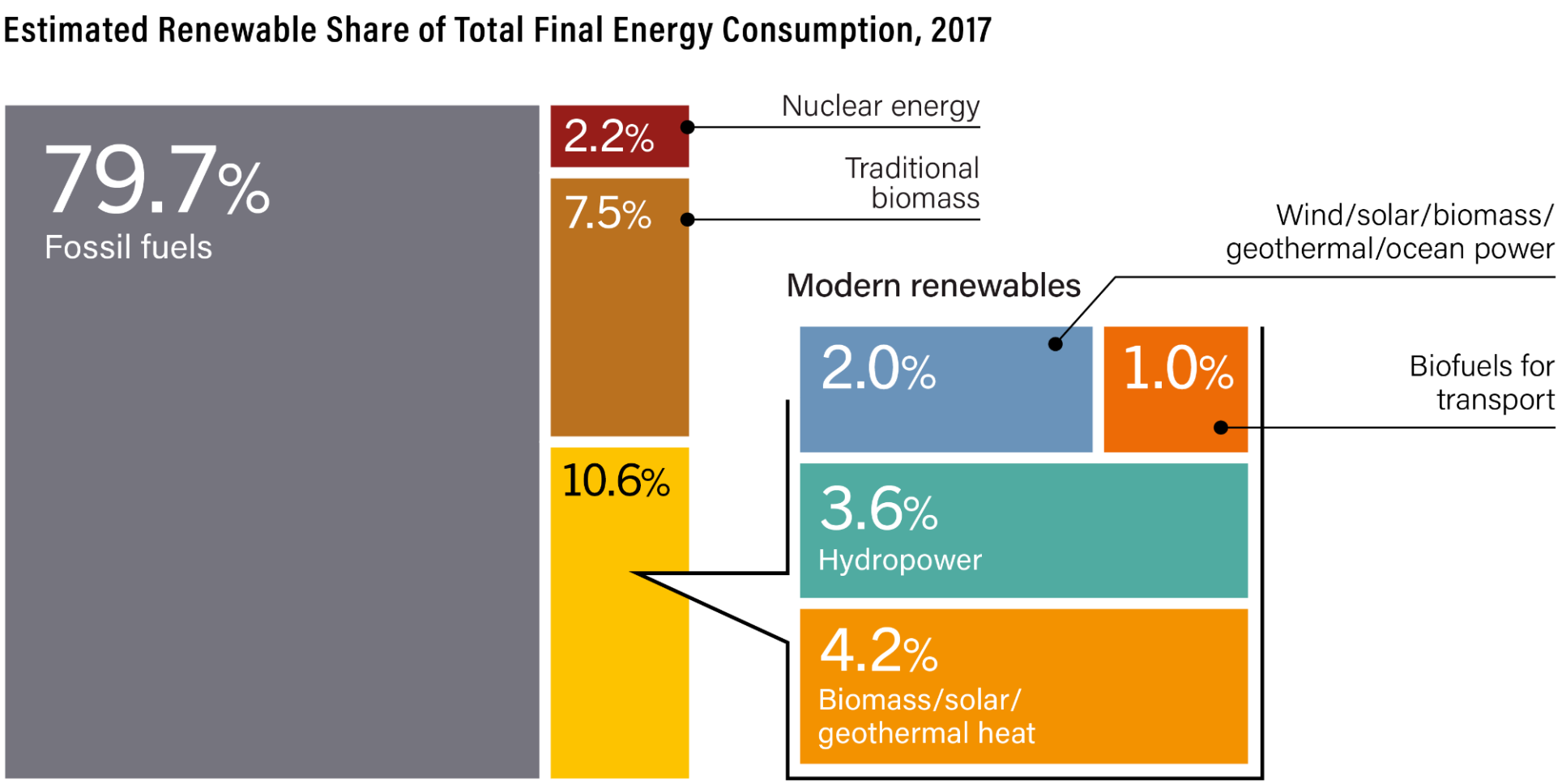
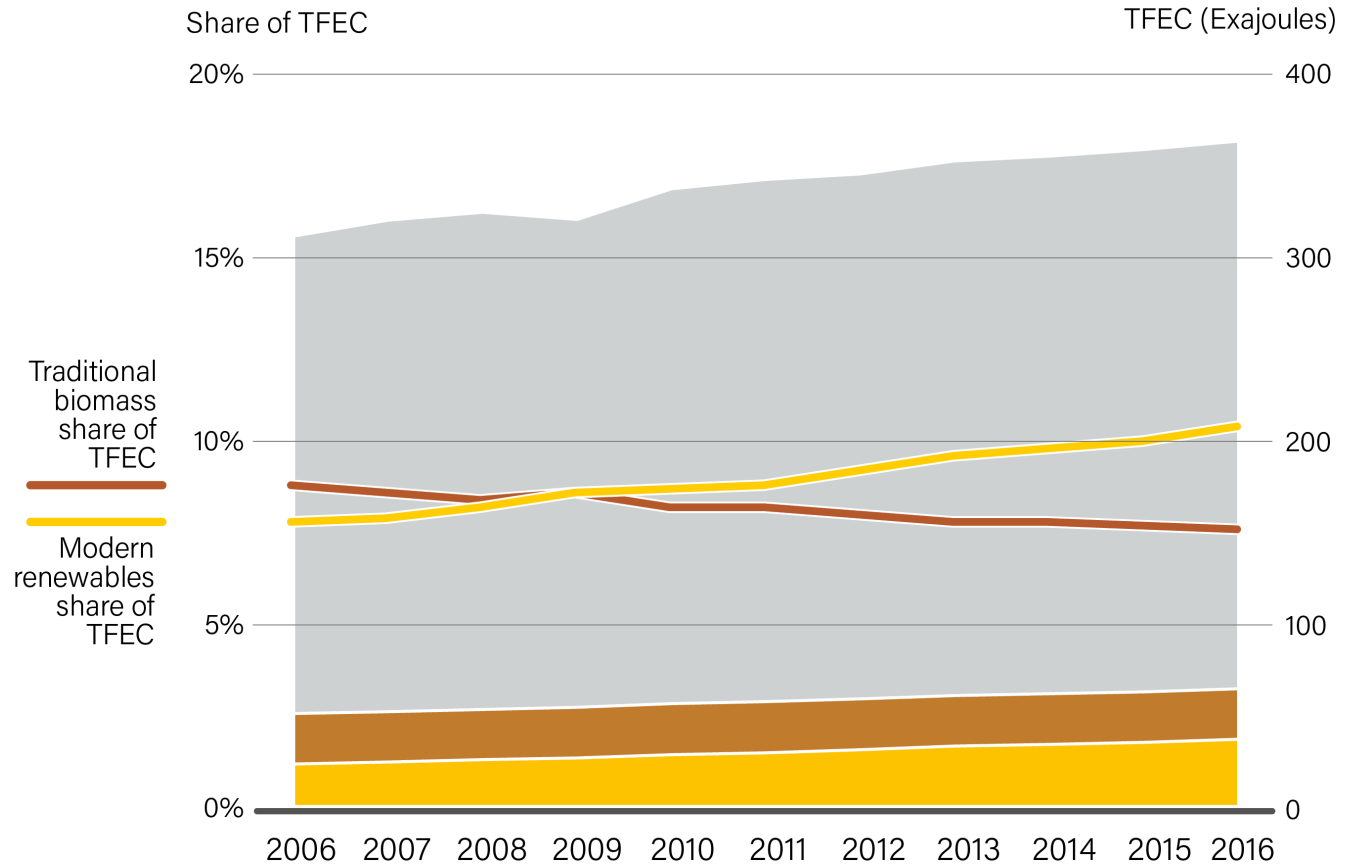
Modern renewables growing faster than fossil fuel, but share remains low



Source: OECD/IEA and IEA SHC.

Modern renewables growing faster than fossil fuel, but share remains low

Growth in Global Renewable Energy Compared to Total Final Energy Consumption, 2006-2016



Source: OECD/IEA.

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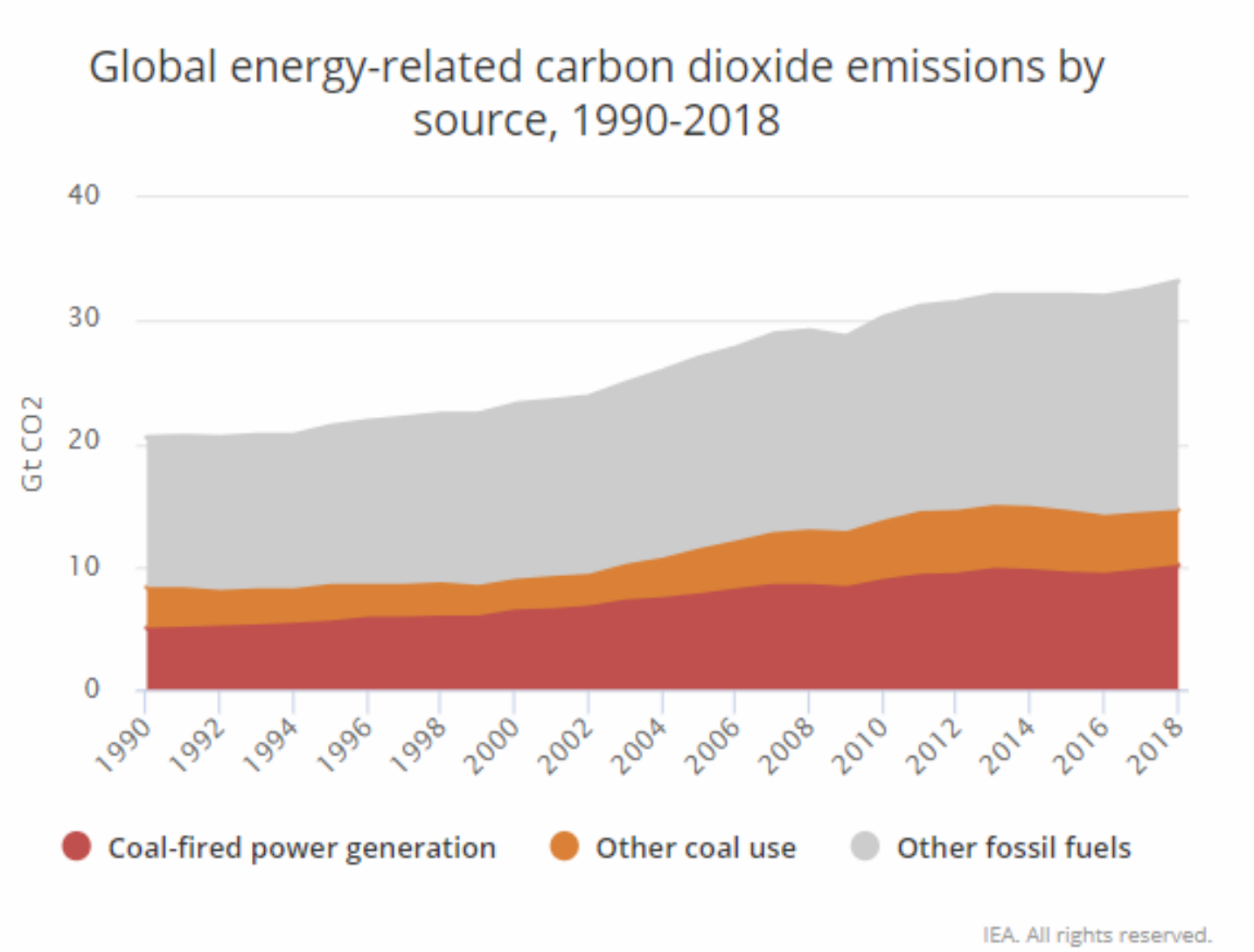
Higher energy consumption leads to global emissions increase



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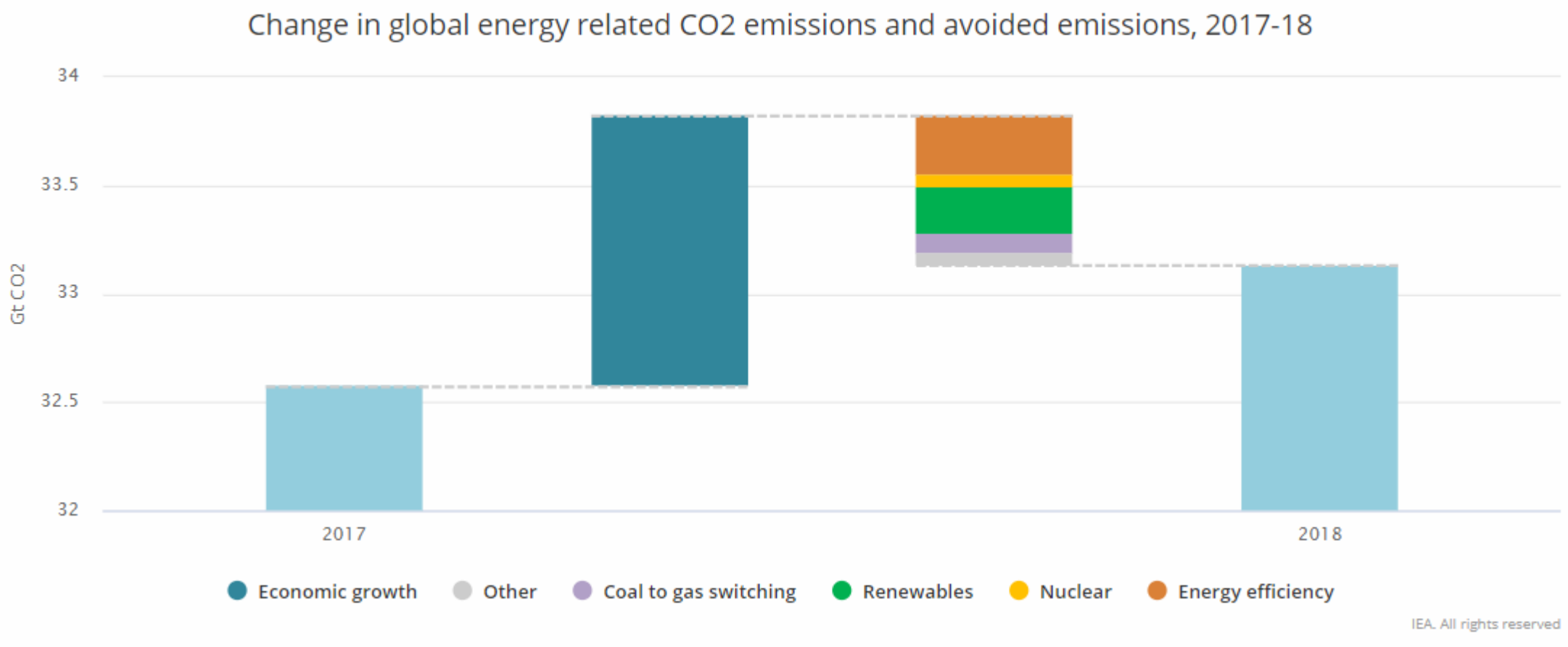
Energy efficiency and renewables were the largest brake on emissions



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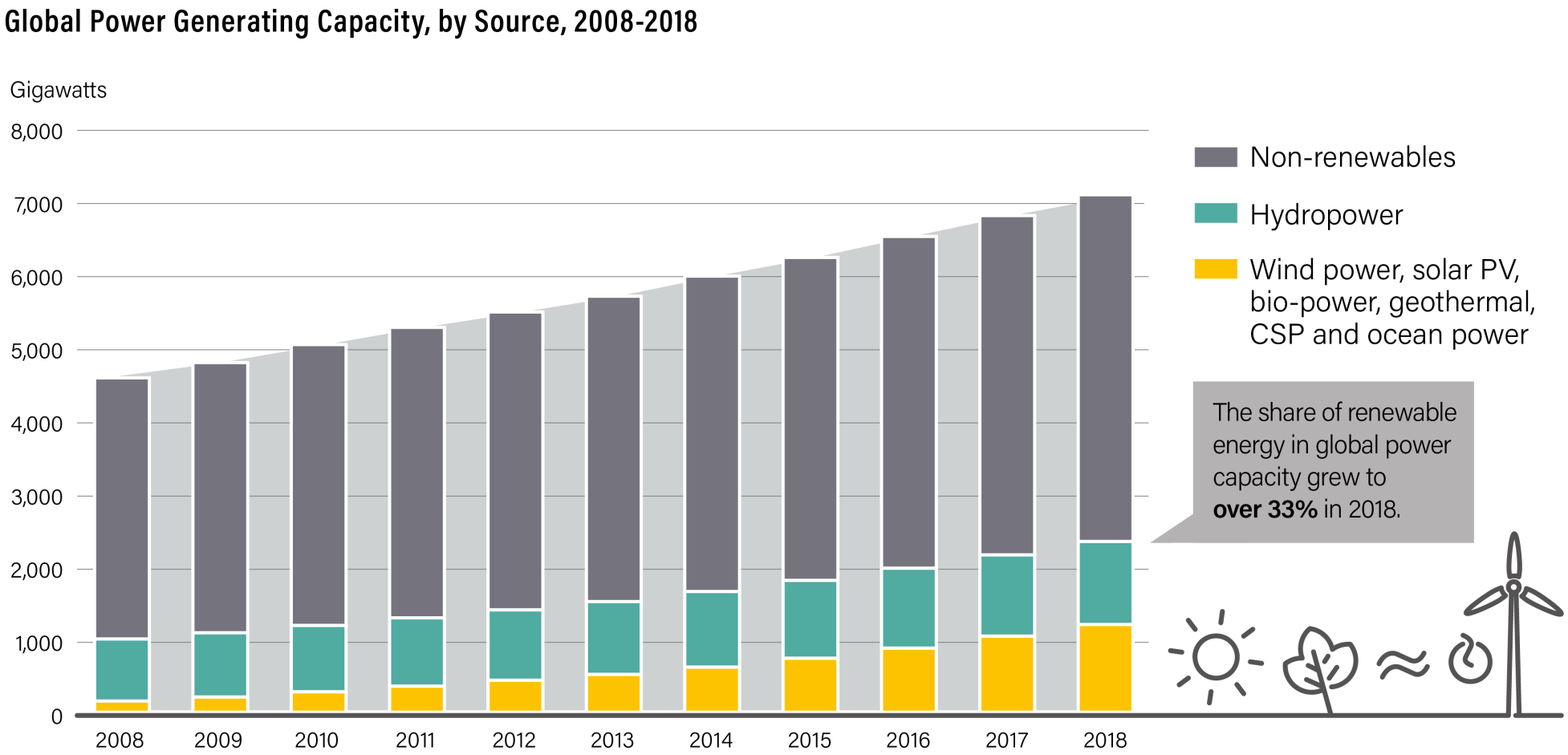
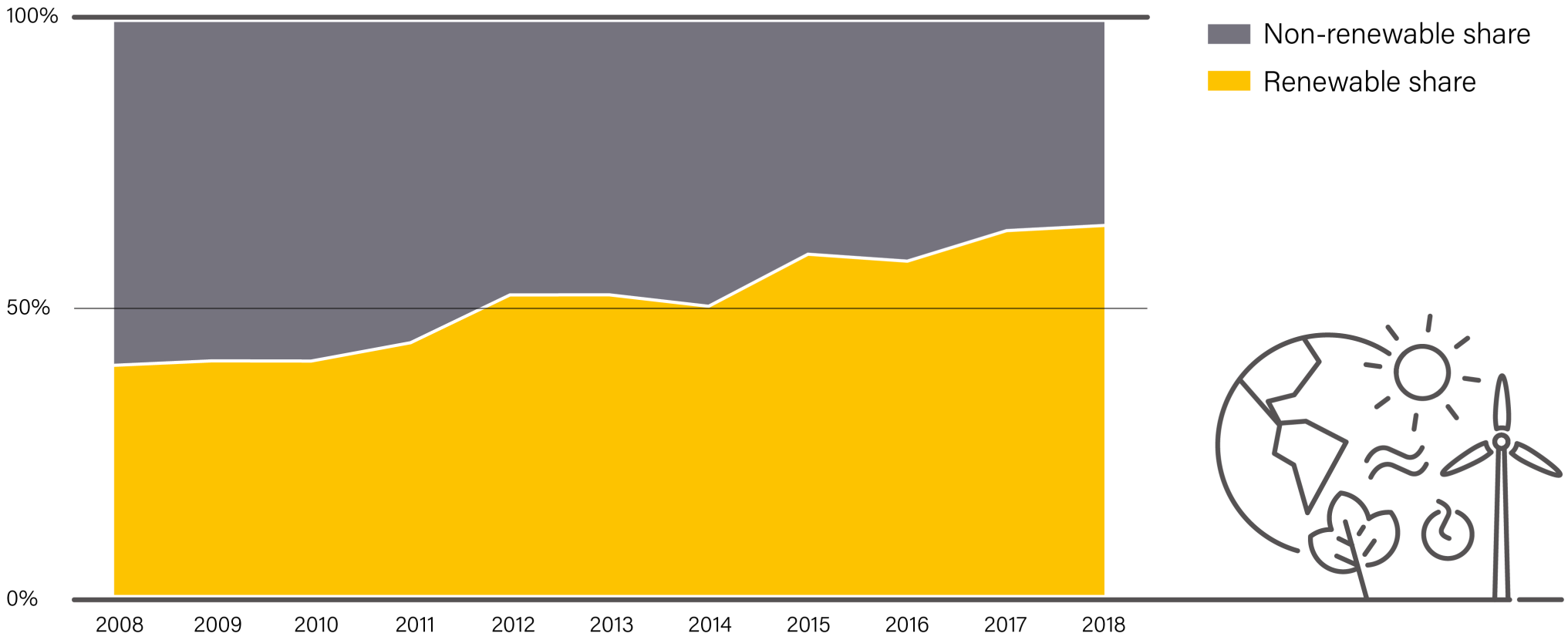
Renewable power now makes up over one-third of global capacity



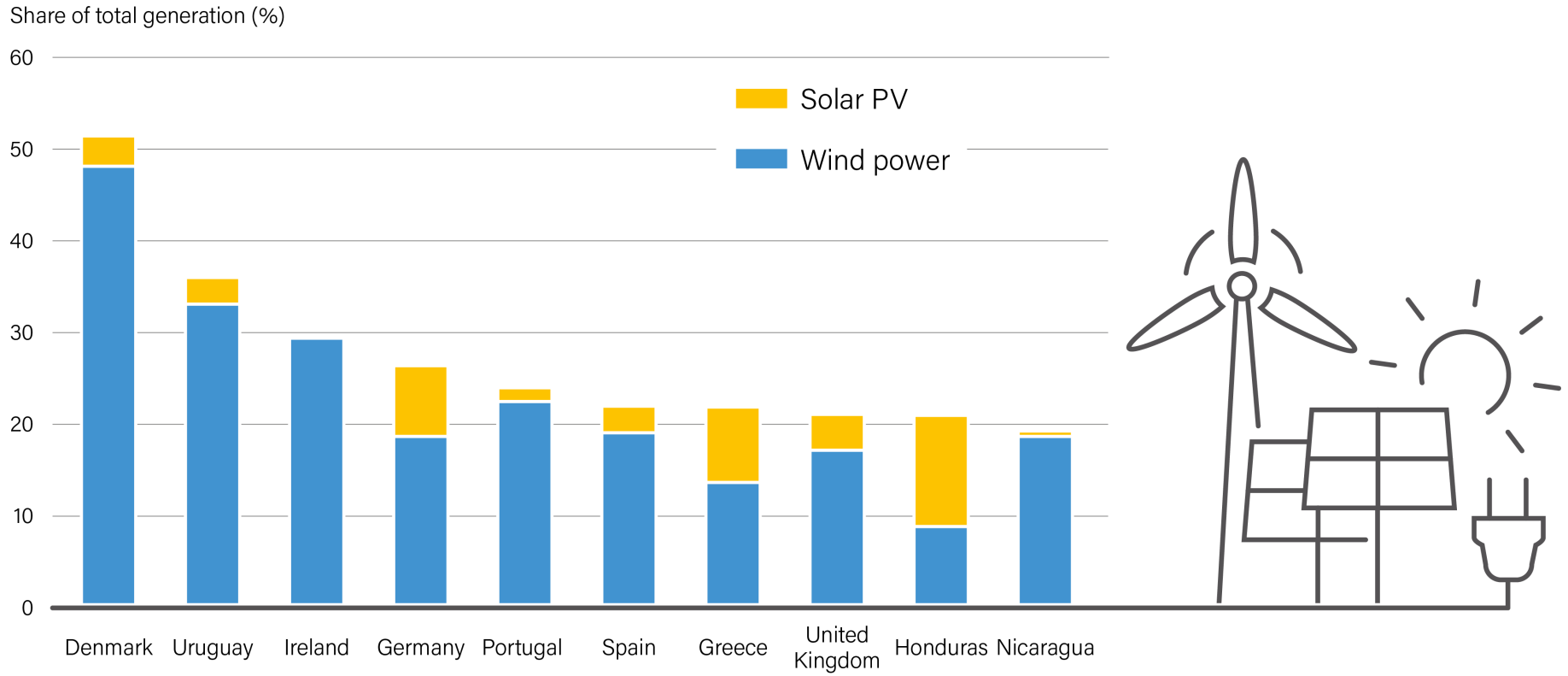
More renewable power capacity added than fossil fuel and nuclear power

Share of Renewables in Net Annual Additions of Power Generating Capacity, 2008-2018



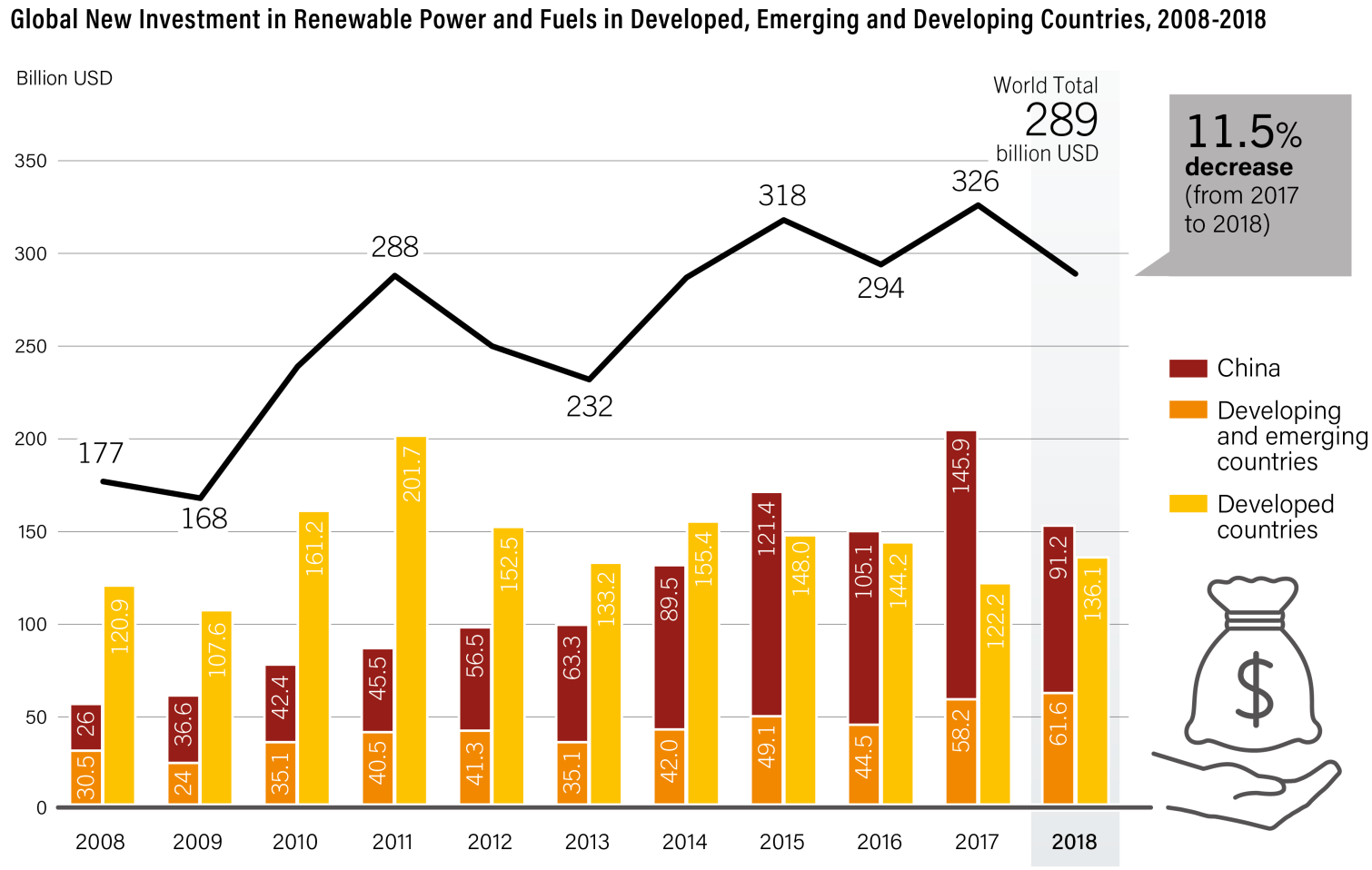
Variable renewable energy is reaching high shares in power grids in more countries

Share of Electricity Generation from Variable Renewable Energy, Top 10 Countries, 2018



Note: This figure includes the top 10 countries according to the best available data known to REN21 at the time of publication.

Investment in renewable energy fell in China, rose elsewhere



Source: BNEF.

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Asia accounted for 52% of new investment worldwide

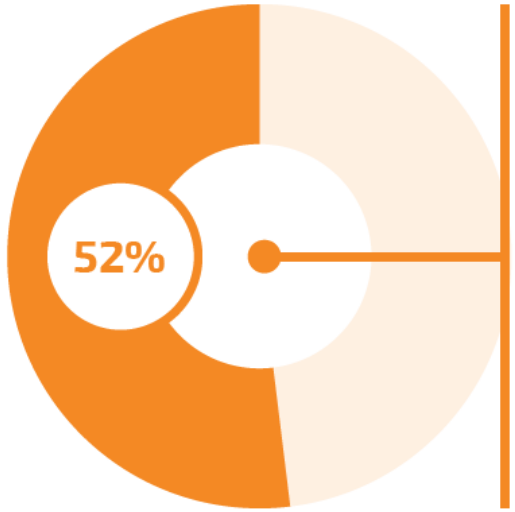
China 91.5 billion

Japan 18.3 billion

India 15.4 billion

Viet Nam 4.1 billion

Korea 2.8 billion



USD **288.9** billion

invested in renewable energy worldwide in 2018.

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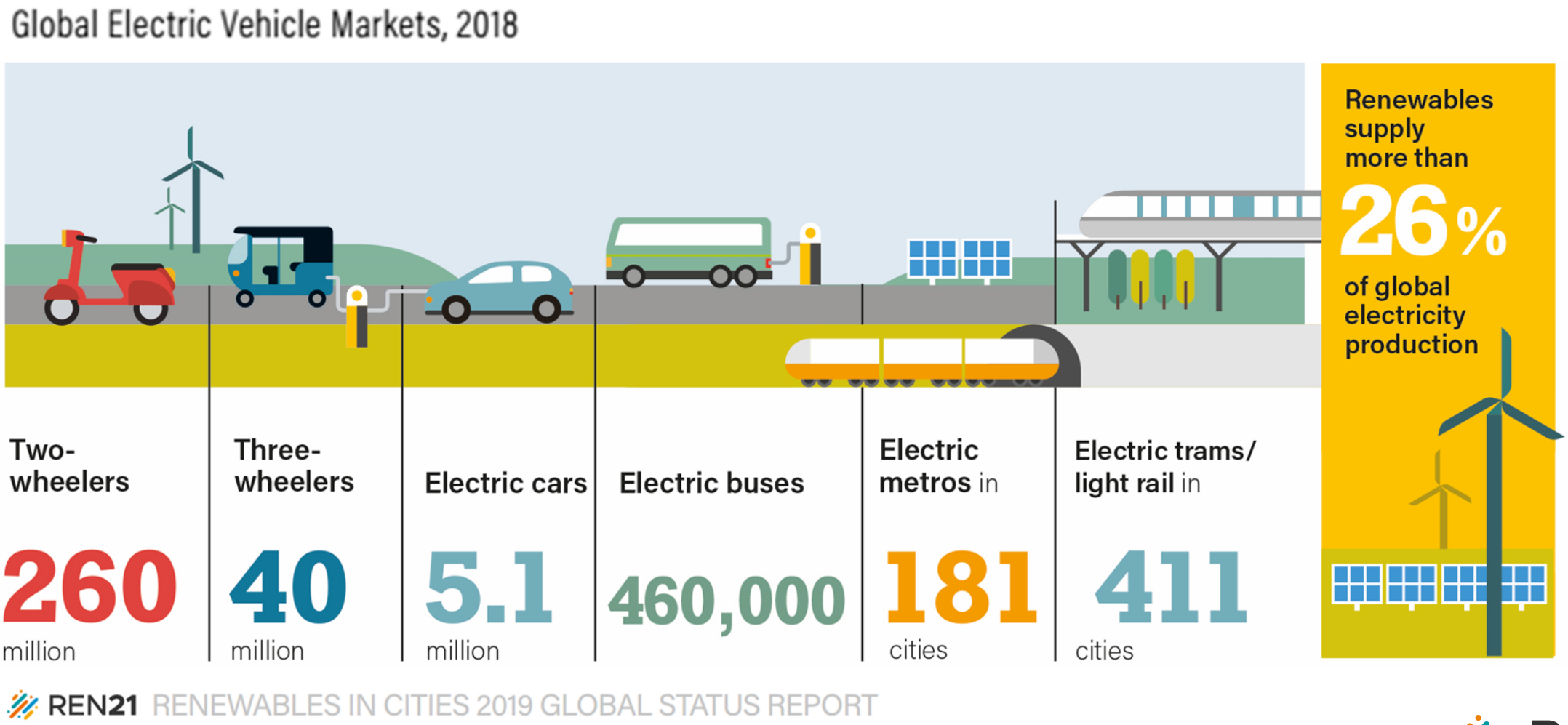
Transport electrification is expanding rapidly



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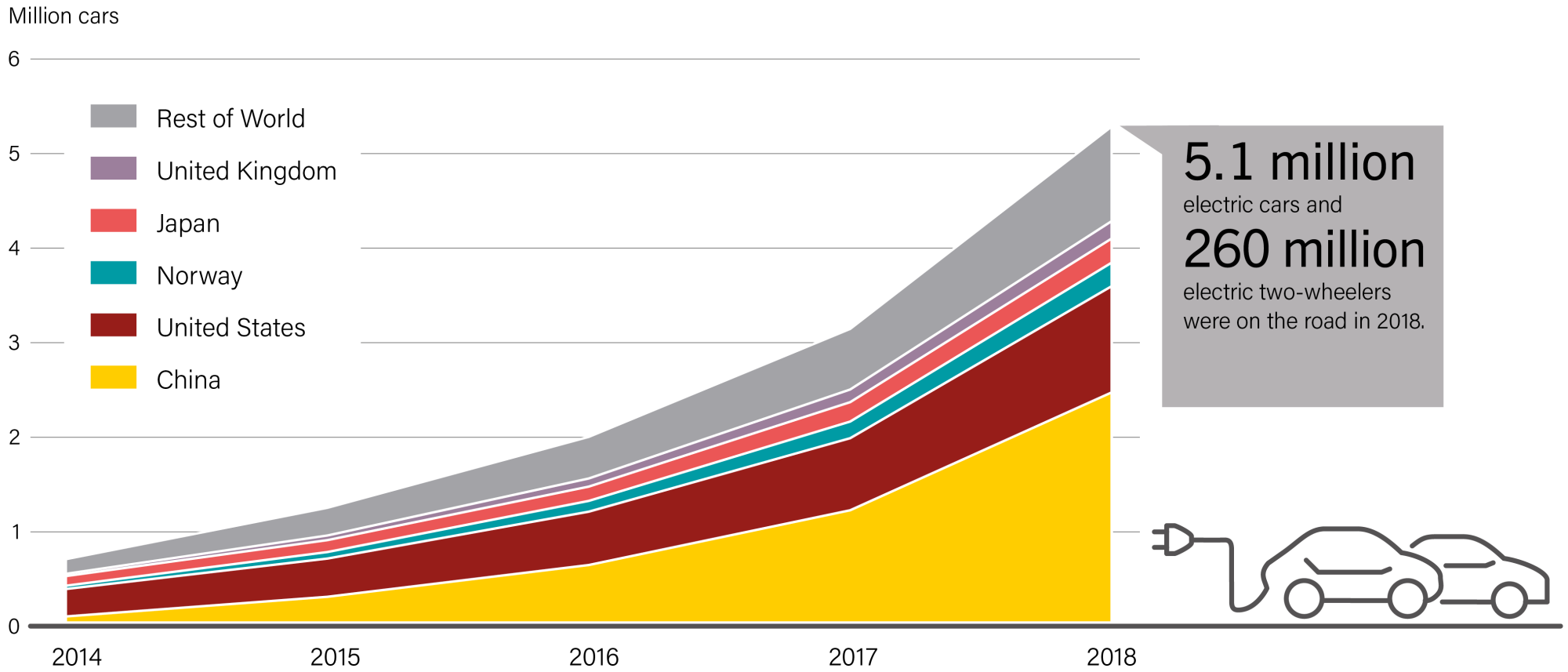
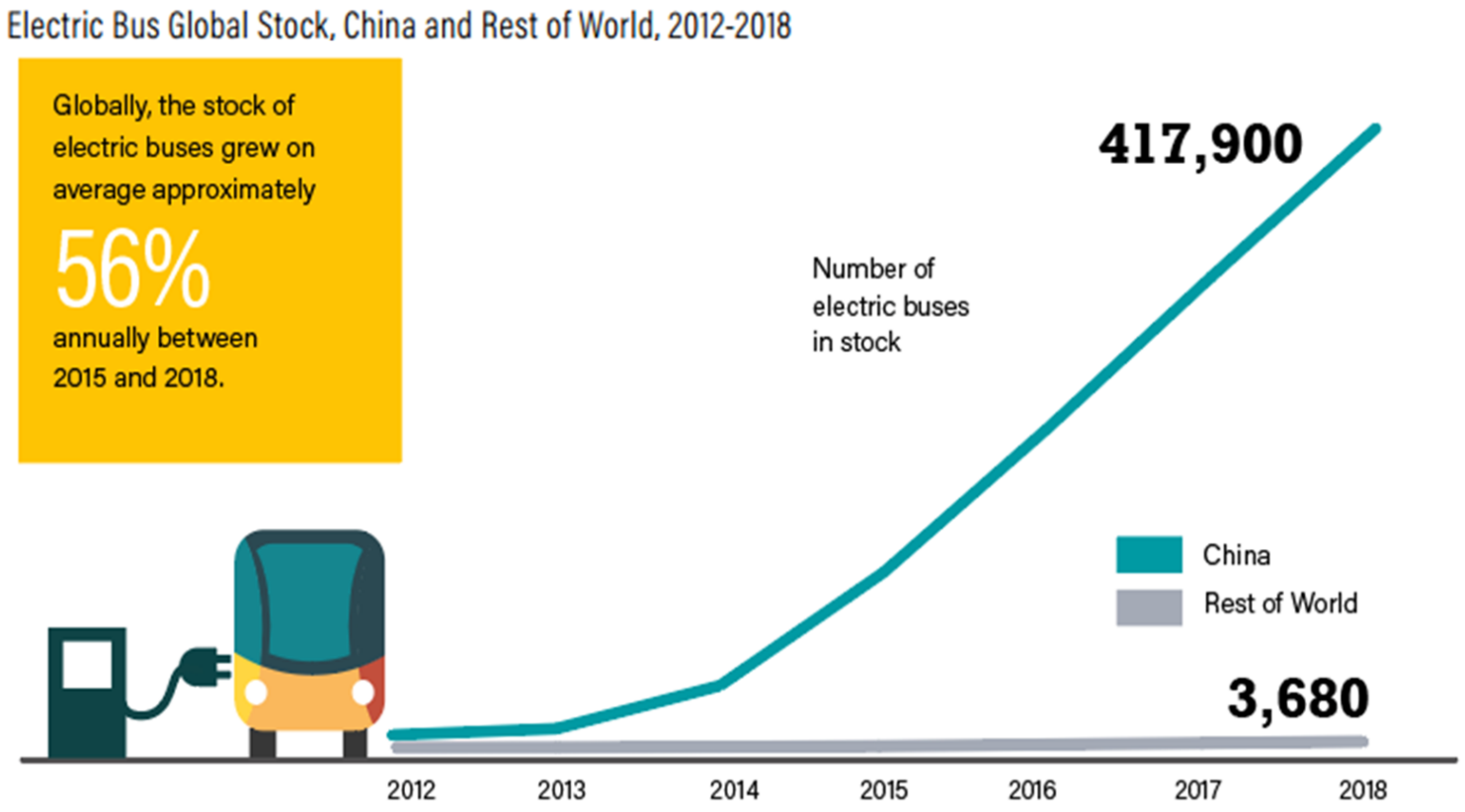
Electric passenger vehicle stock grew over 60%

Electric Car Global Stock, Top 5 Countries and Rest of World, 2014-2018



Source: OECD/IEA.

Electric buses growing, concentrated in China

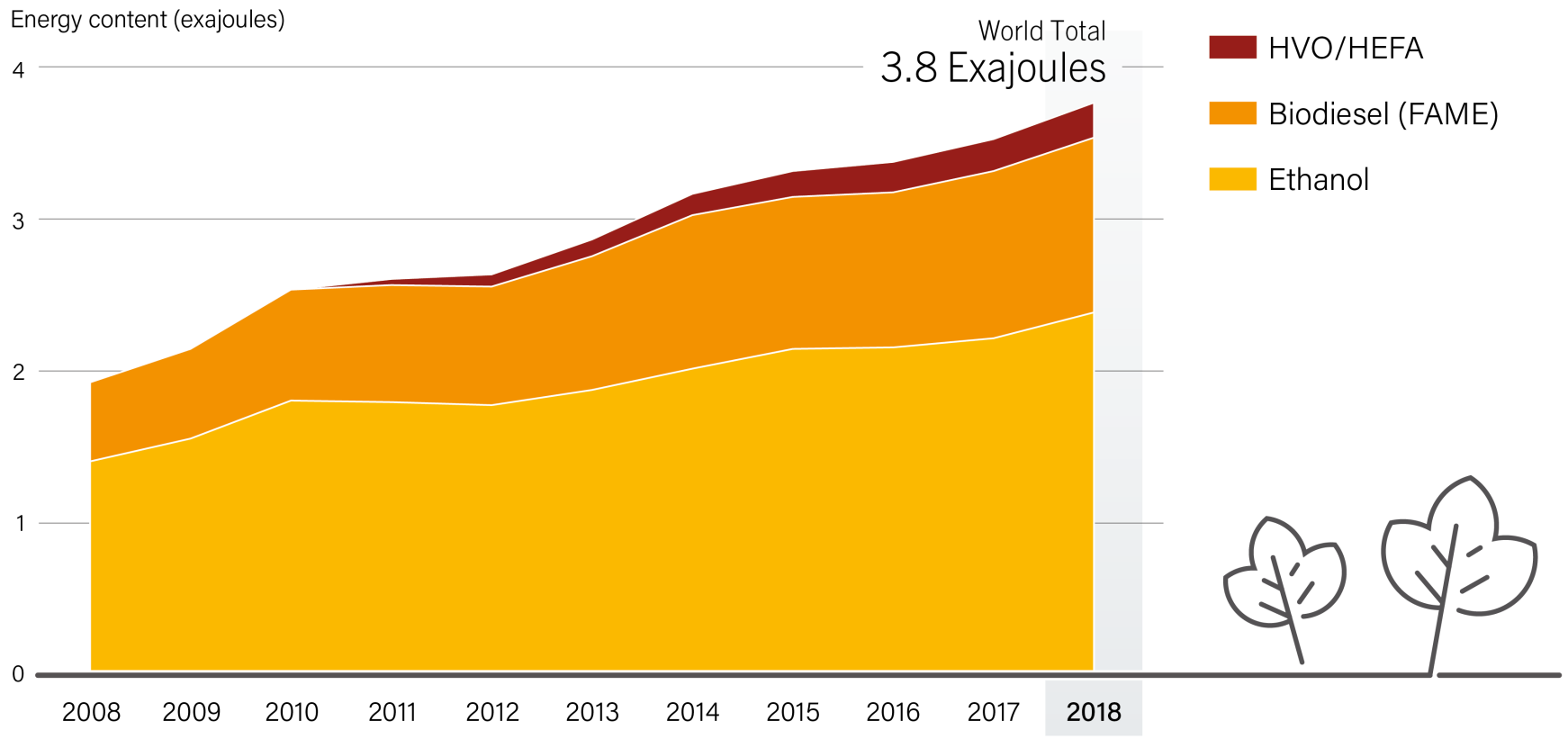


Note: Data are from BloombergNEF. Sales add up to 425,000 electric buses, which presents a discrepancy from the 460,000 reported by the International Energy Agency.

RoW = Rest of World

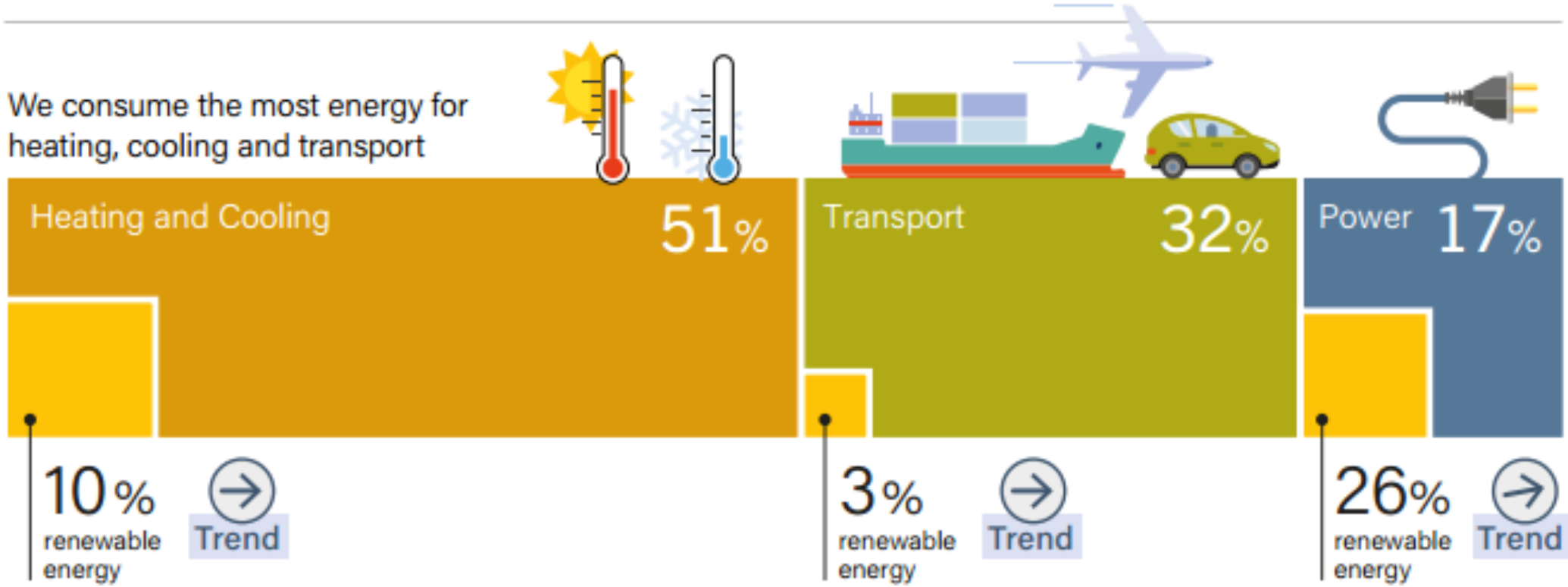
Biofuels production increases, dominated by US and Brazil

Global Ethanol, Biodiesel and HVO/HEFA Fuel Production by Energy Content, 2008-2018



Note: HVO = hydrotreated vegetable oil; HEFA = hydrotreated esters and fatty acids; FAME = fatty acid methyl esters

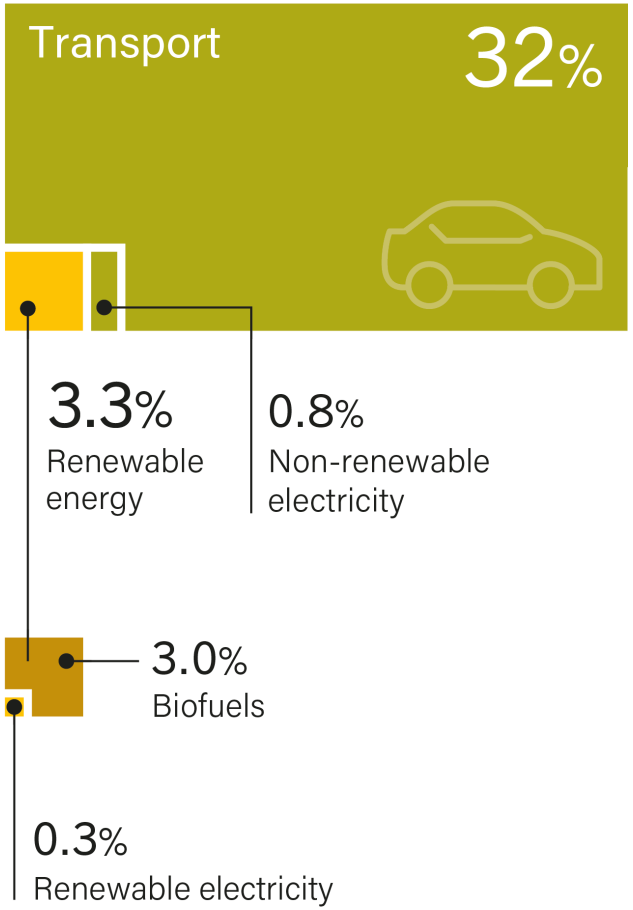
More than 80% of energy demand is for heating, cooling, and transport



Source: OECD/IEA.

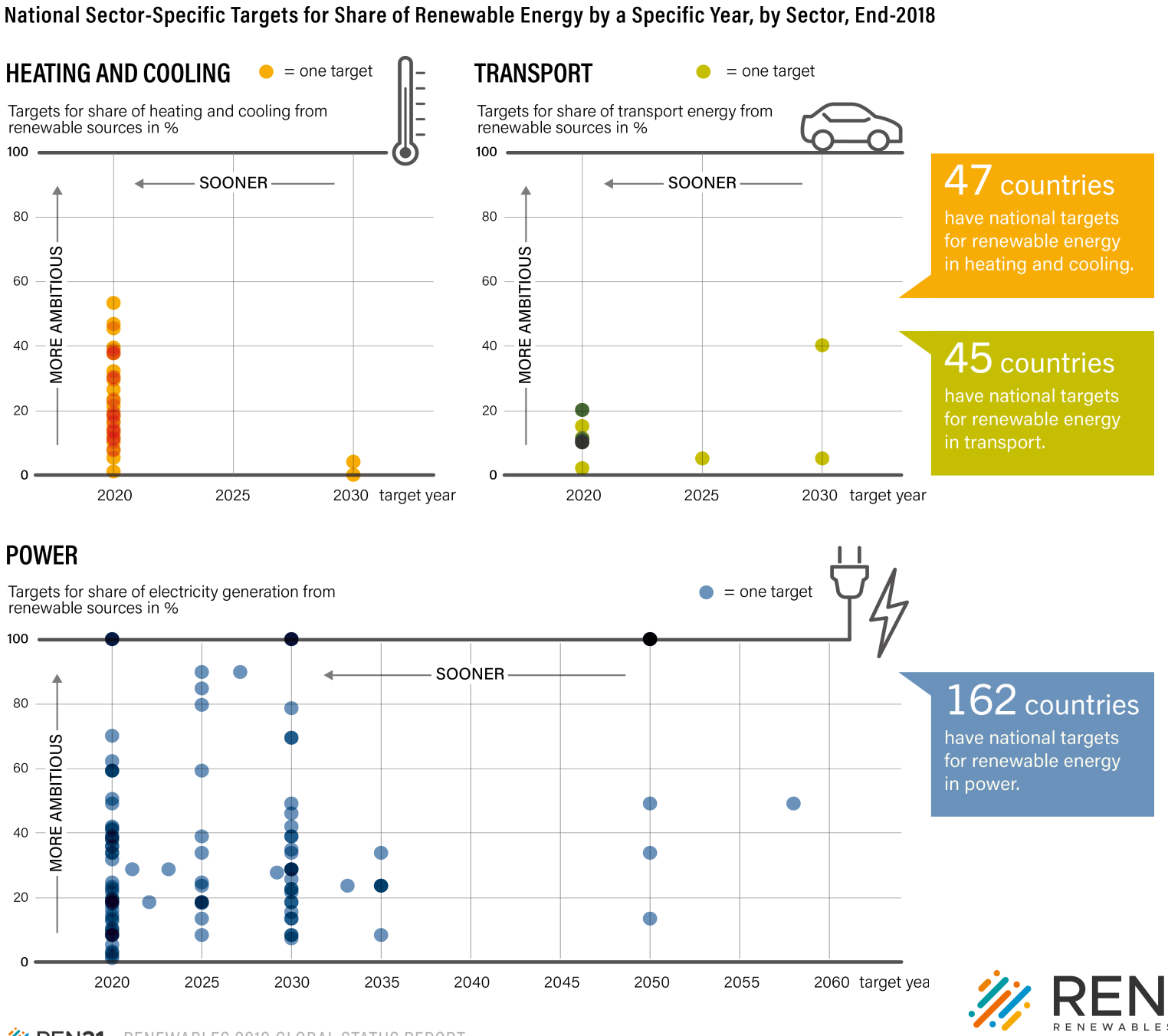
Biofuels and EVs growing, but renewable share in transport remains low

- Global energy demand in transport increased 45% since 2000
- Transport accounts for 23% of global CO2 emissions
- The renewable share of transport grew slightly to 3.3%
- Biofuels make up majority of renewable contribution, but sector increasingly open to electrification



Source: OECD/IEA.

Targets uneven across sectors



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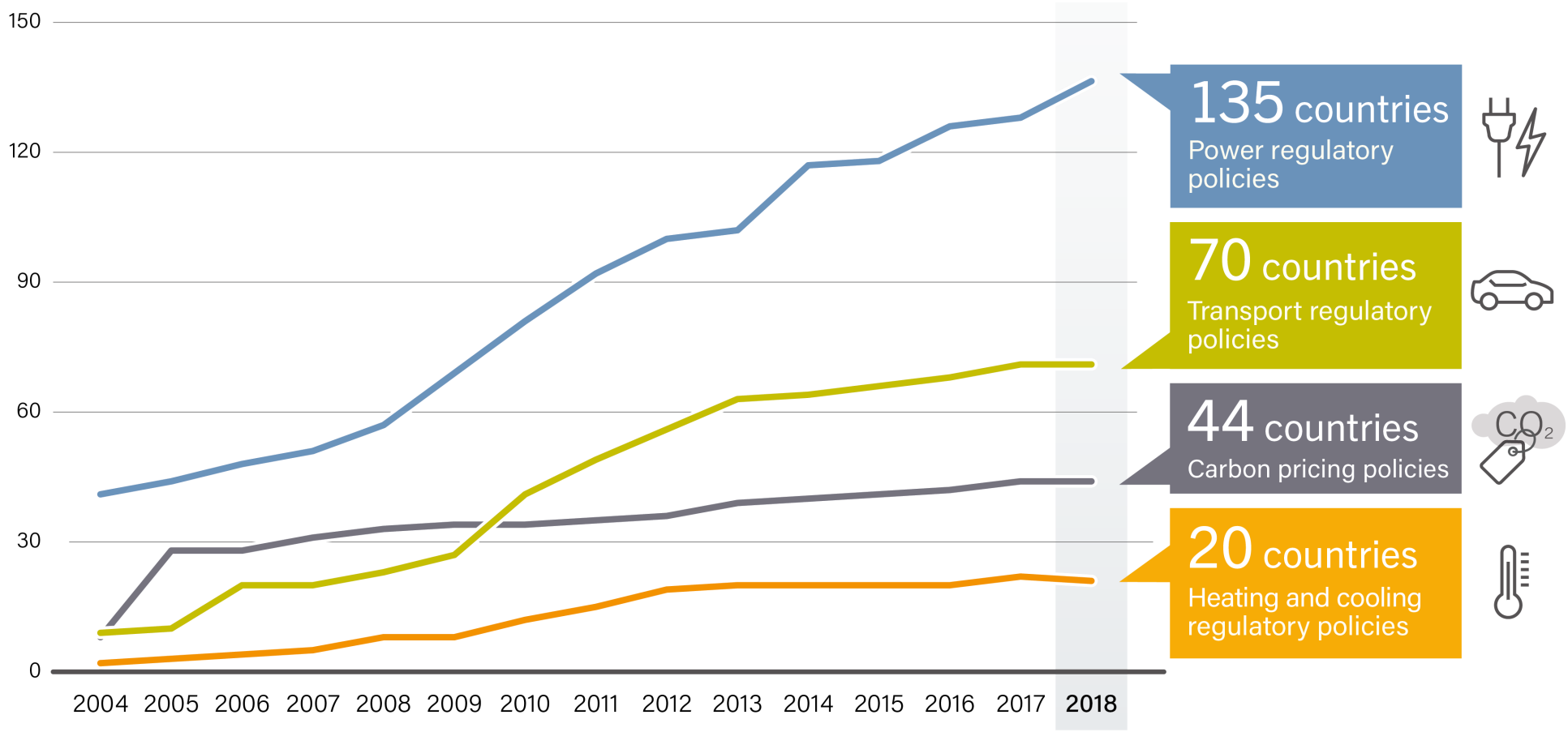
Advances in power made possible by policy support, other sectors lacking

Number of Countries with Renewable Energy Regulatory Policies and Carbon Pricing Policies, 2004-2018



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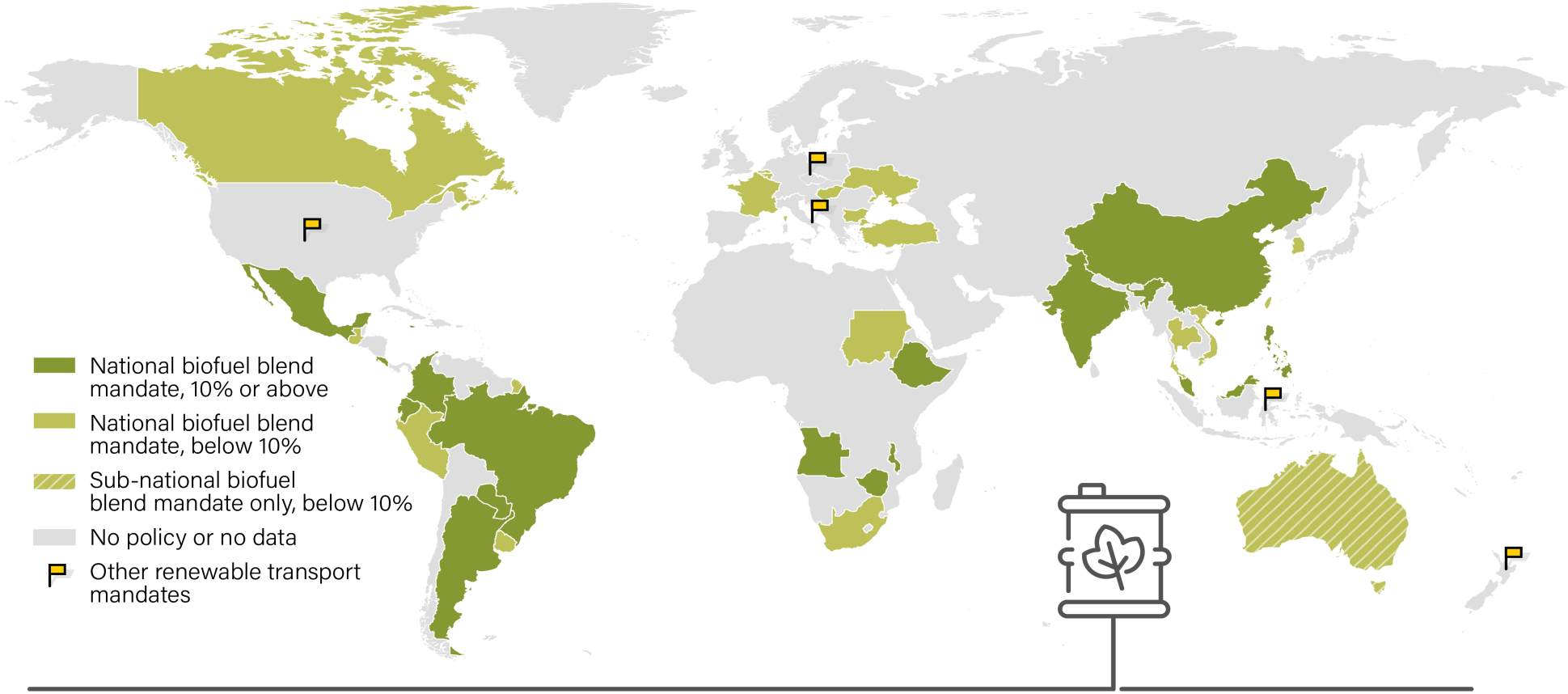
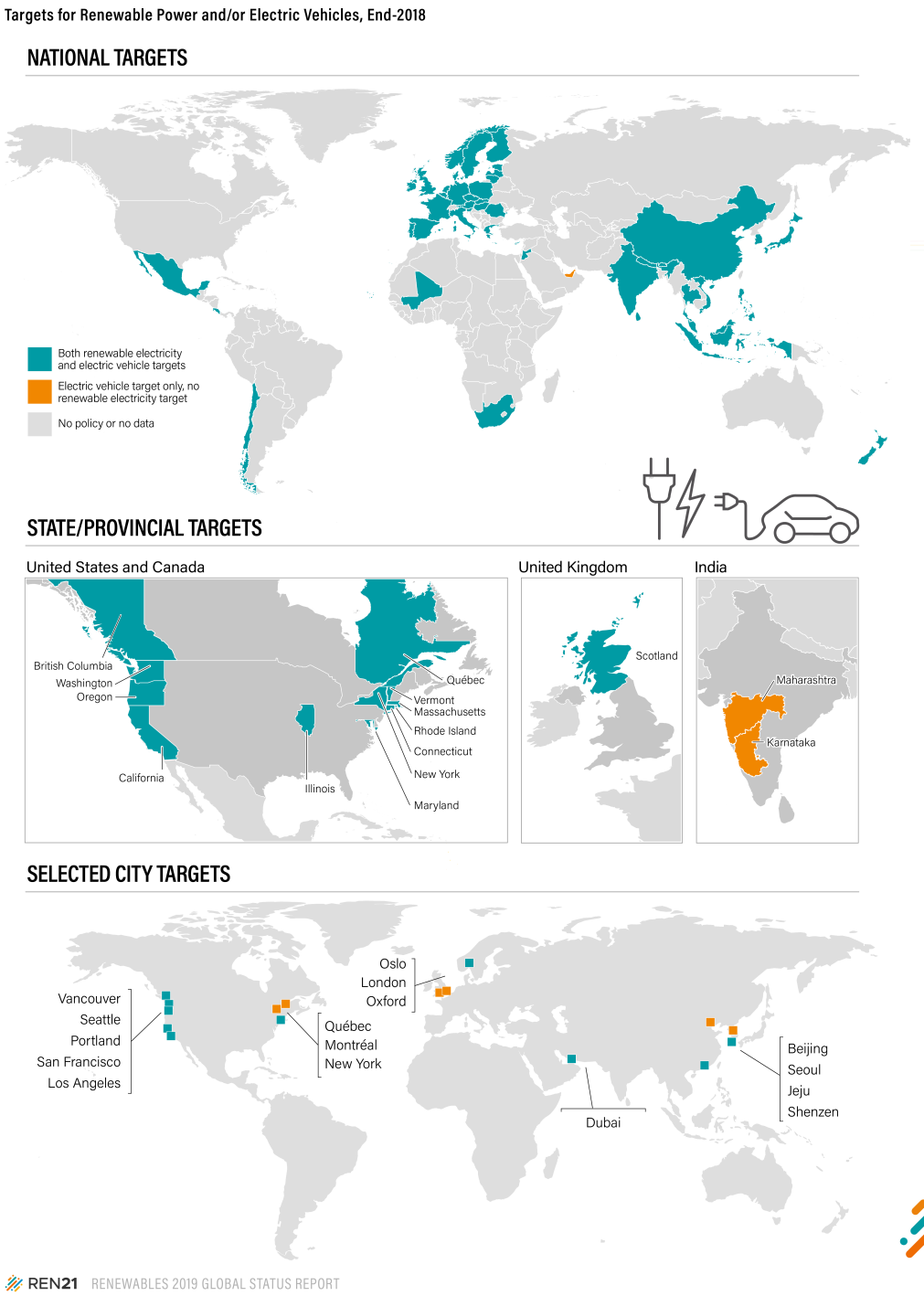
Direct policy support remains static for renewables in transport

National and Sub-National Renewable Transport Mandates, End-2018



Source: REN21 Policy Database.

Little direct linking of EVs and renewables



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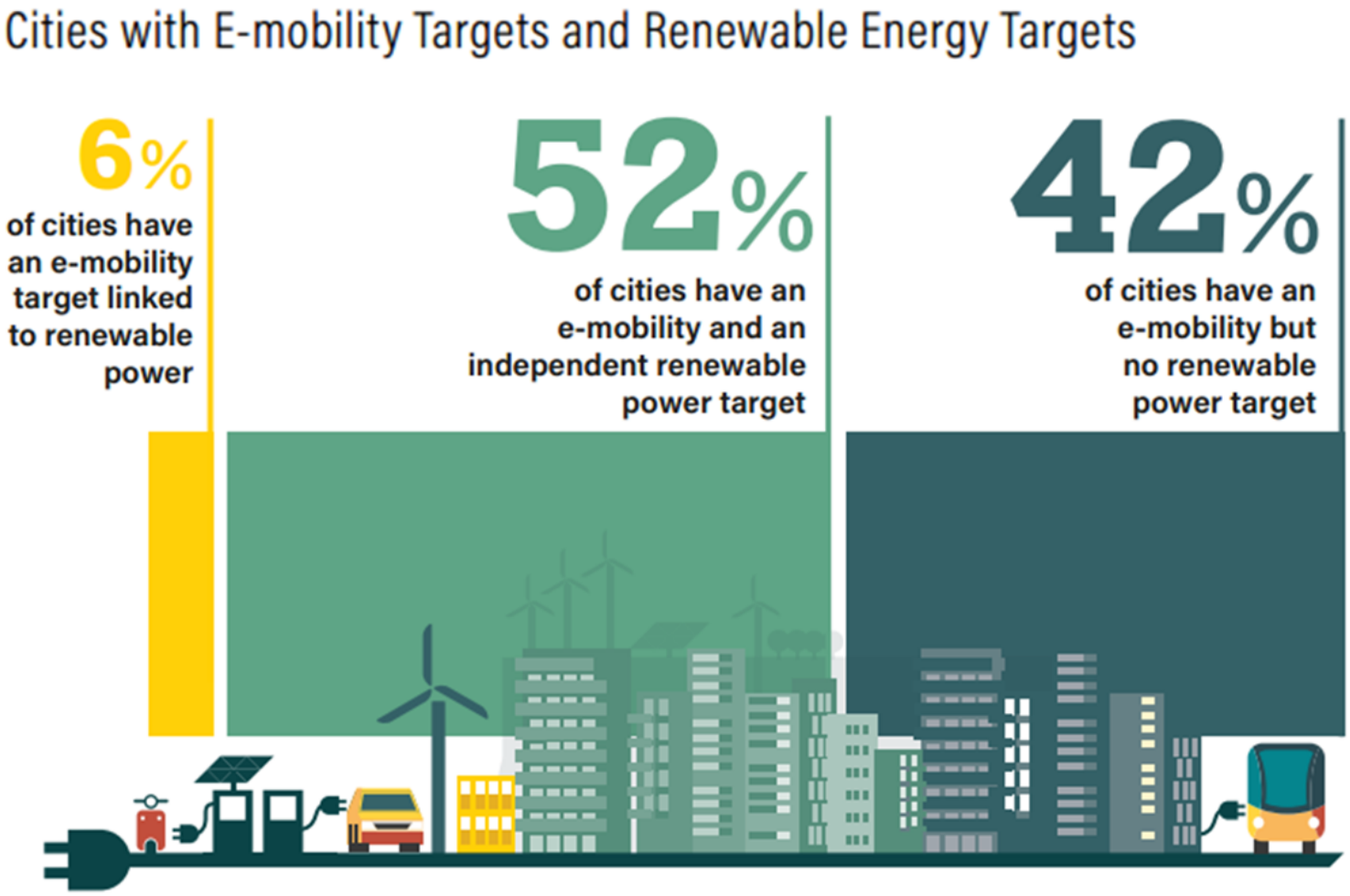
Few cities linking e-mobility and renewables



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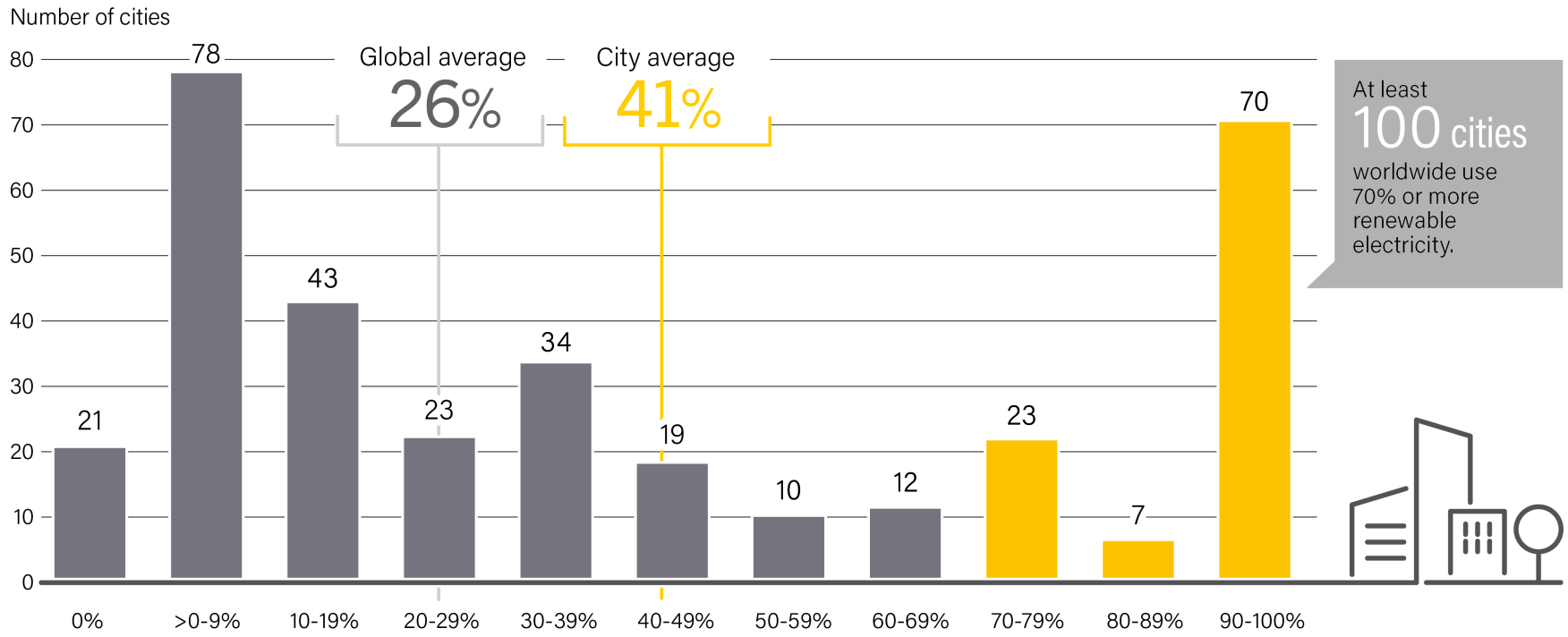
Cities are advancing renewables across sectors to achieve diverse goals

Renewable Power in Cities*, by Number of Cities and Renewable Share, 2017



* The figure shows shares of renewables in the electricity consumption of 340 cities that self-reported to CDP.

Source: CDP.

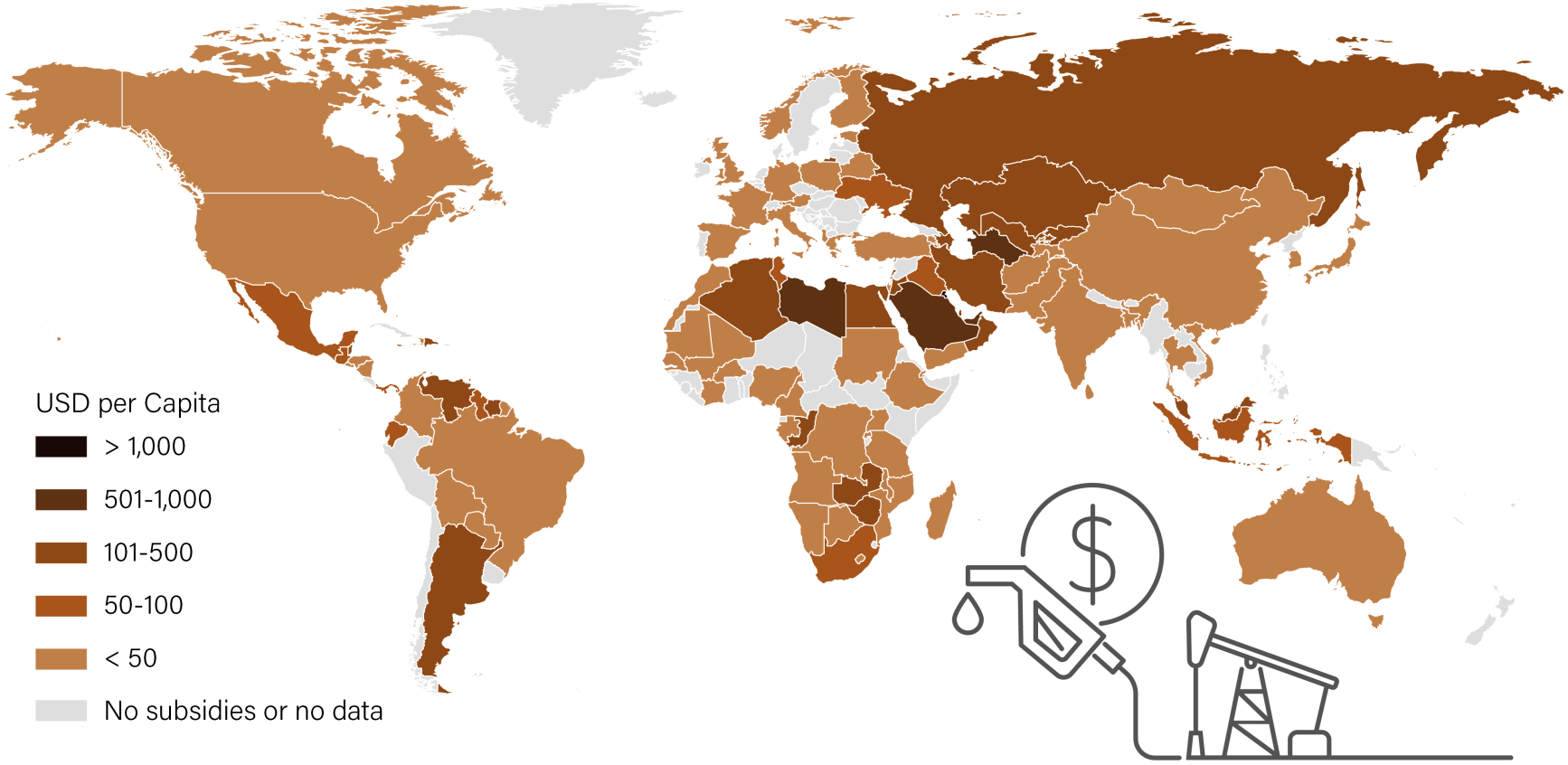
Note: City average is calculated based on the 340 cities shown.
Categories include all values below the lower limit of adjacent category.

Broad policy support influencing renewable energy in transport

- Fuel economy policies for LDVs in 40 countries by end-2018, 5 countries for trucks
- EU agreed on CO2 emission standards for HDVs
- Targets for fossil fuel and ICE vehicle bans increasing

Not a level playing field: Fossil fuel subsidies are still widespread

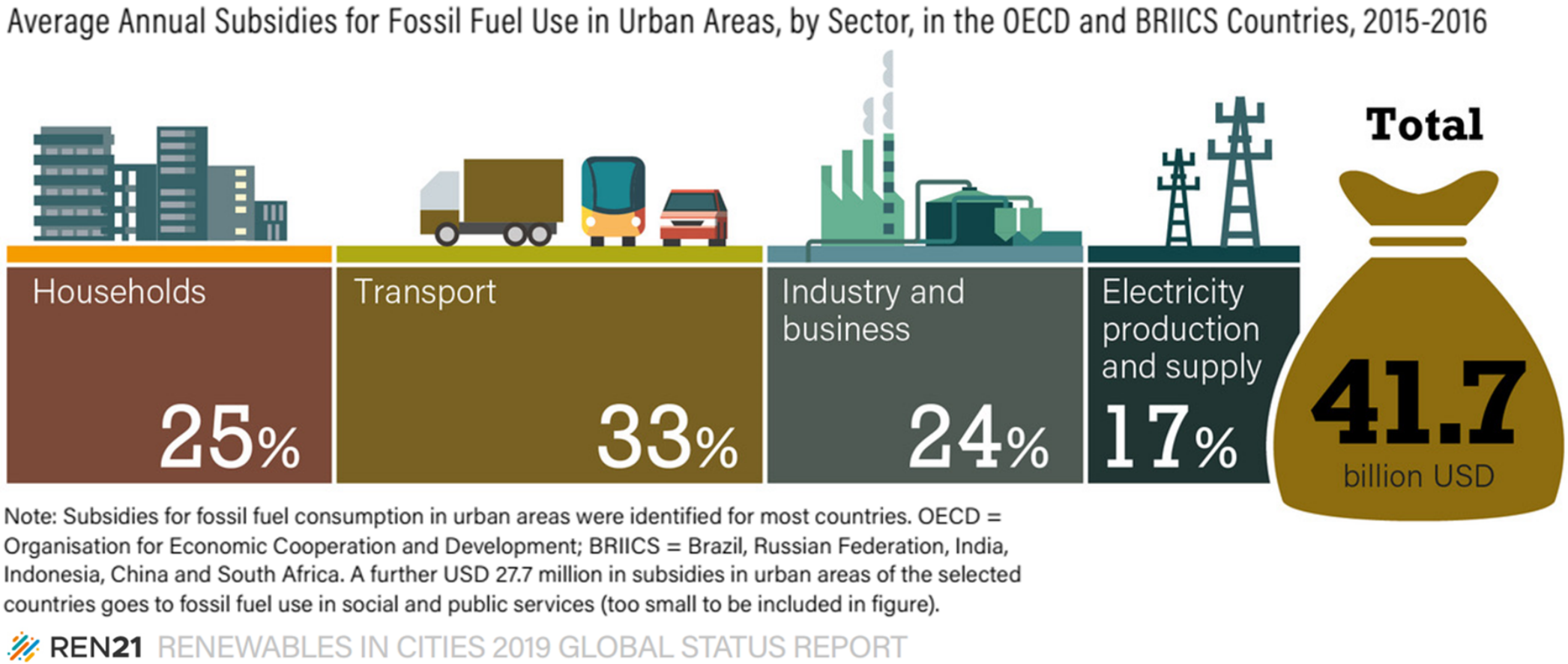
Fossil Fuel Subsidies, per Person, by Country, 2017



Note: Shading depicts pre-tax consumption subsidies only.

Source: IMF.

Not a level playing field: Fossil fuel subsidies are still widespread



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What is needed to advance the energy transition in the transport sector?

- **Set ambitious targets** across all sectors
- Accelerate investment in renewable **power**, while also establishing new (and strengthening existing) policies for renewables in **transport**
- Encourage **sector coupling** among the power, heating and cooling, and transport sectors
- Enact integrated policies that enforce **energy efficiency** measures while promoting the uptake of renewable energy
- Enact **carbon pricing** policies, and **phase out fossil fuel** subsidies
- Support local job creation and a **just transition**
- Build **social acceptance** and increase public buy-in
- **Align** regional, national and sub-national policies, and **support cities** in their actions

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Thank you!

Making the invisible visible.

REN21 changes the way we think about renewable energy.

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www.ren21.net

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