



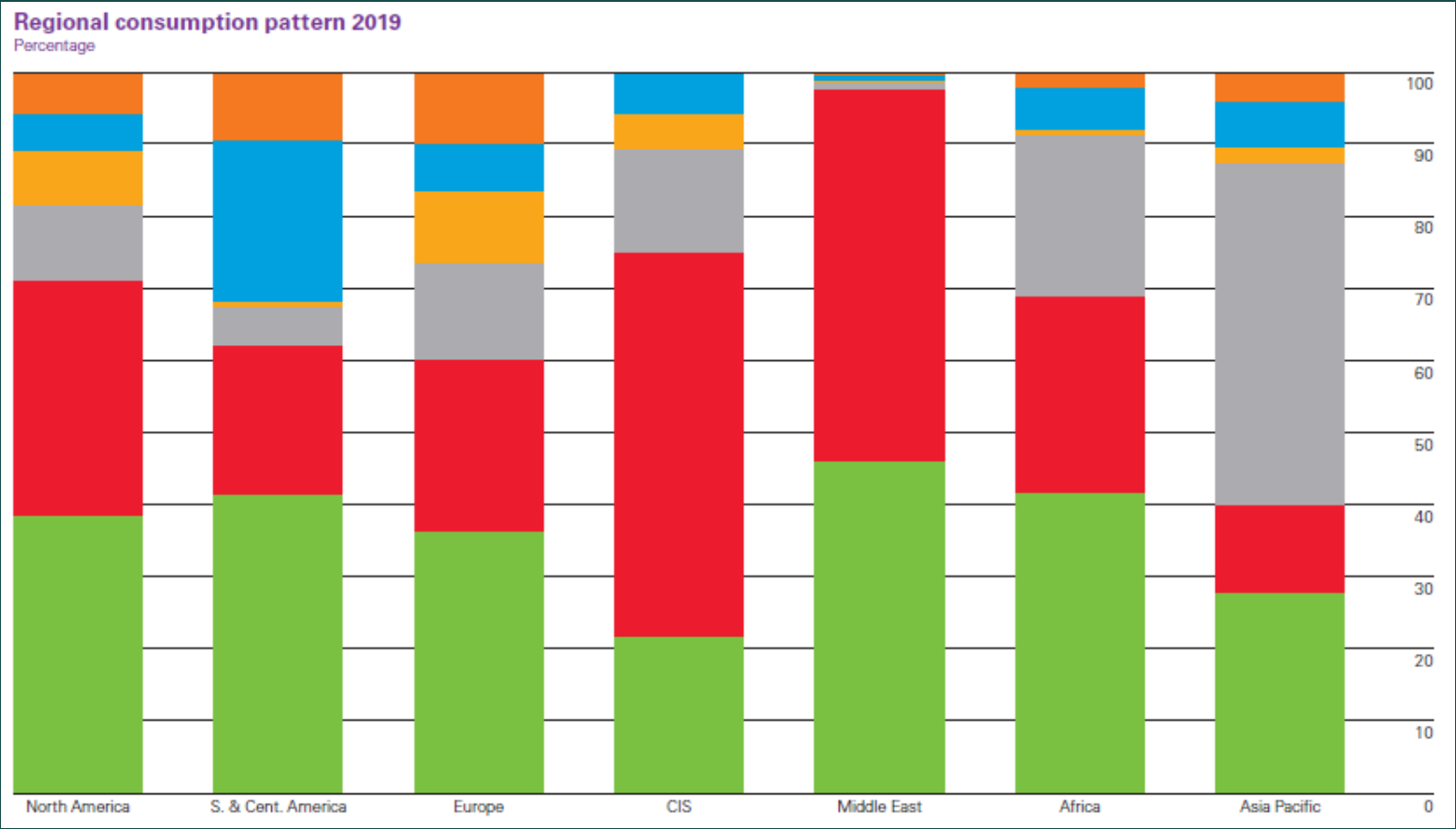
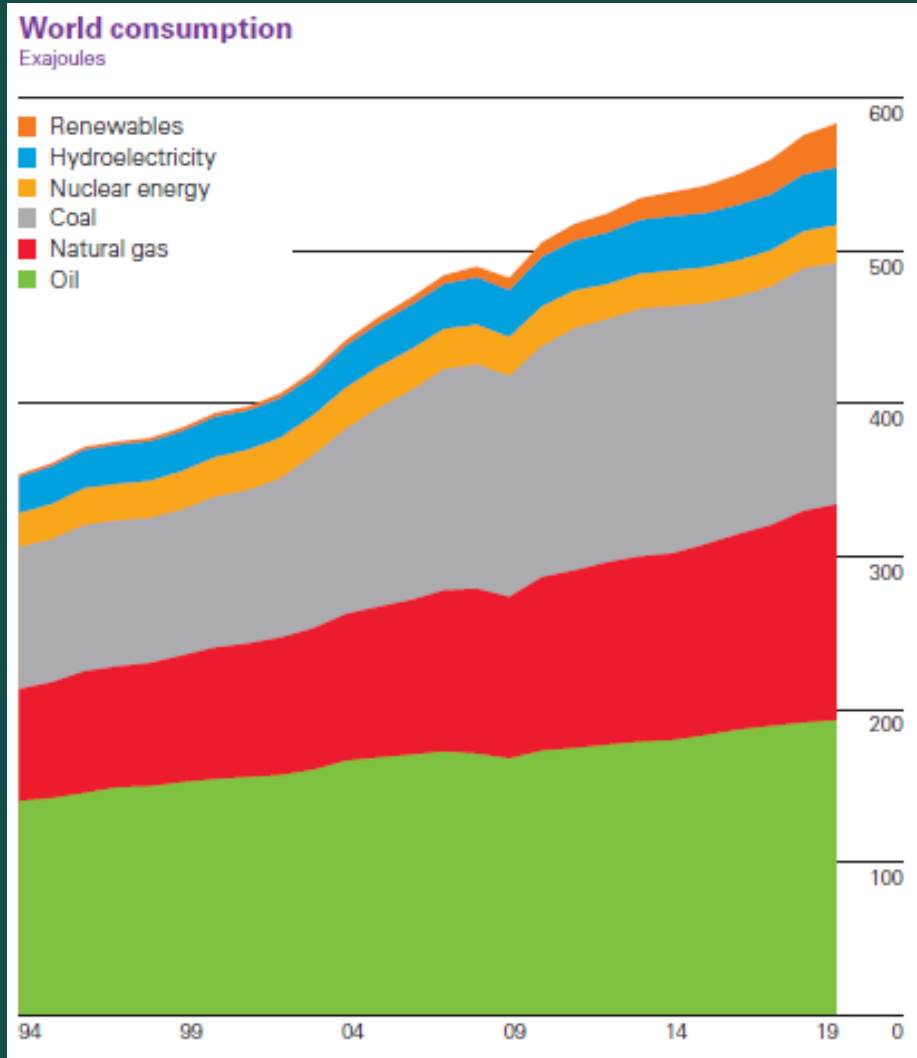
ENERGY TRANSITION

Continent Specific Developments

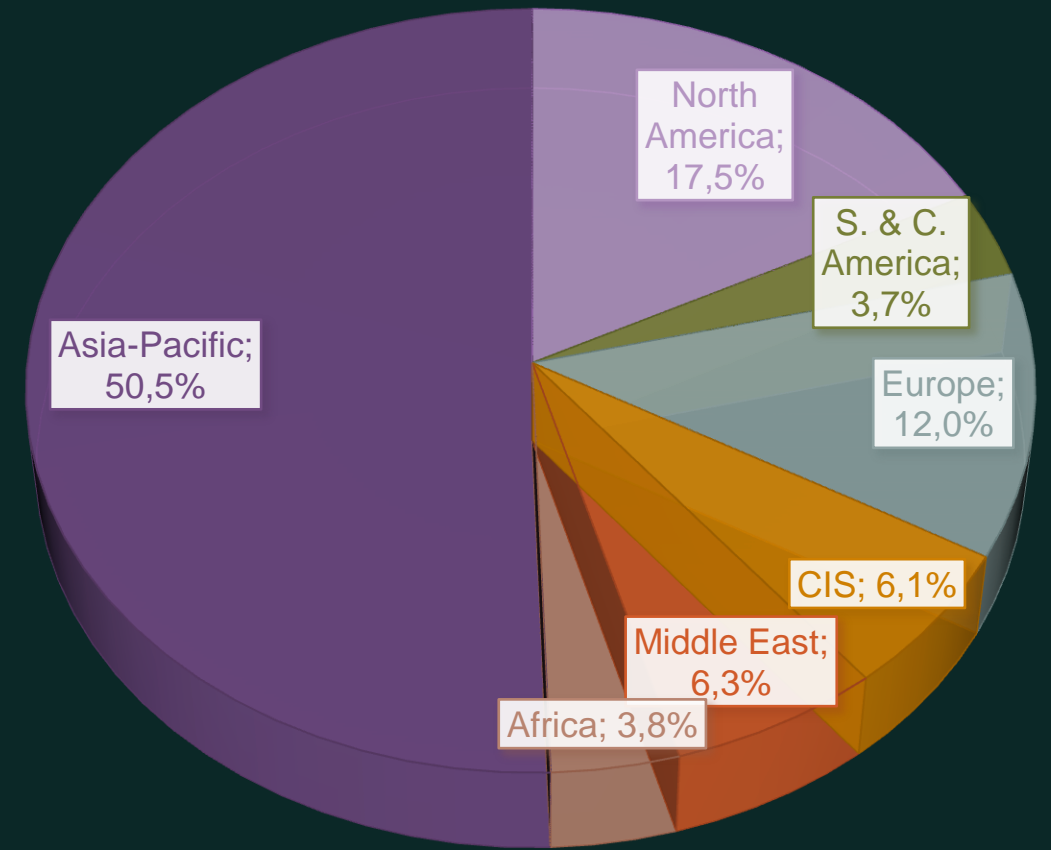
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Primary Energy Consumption by Source: BP Stats

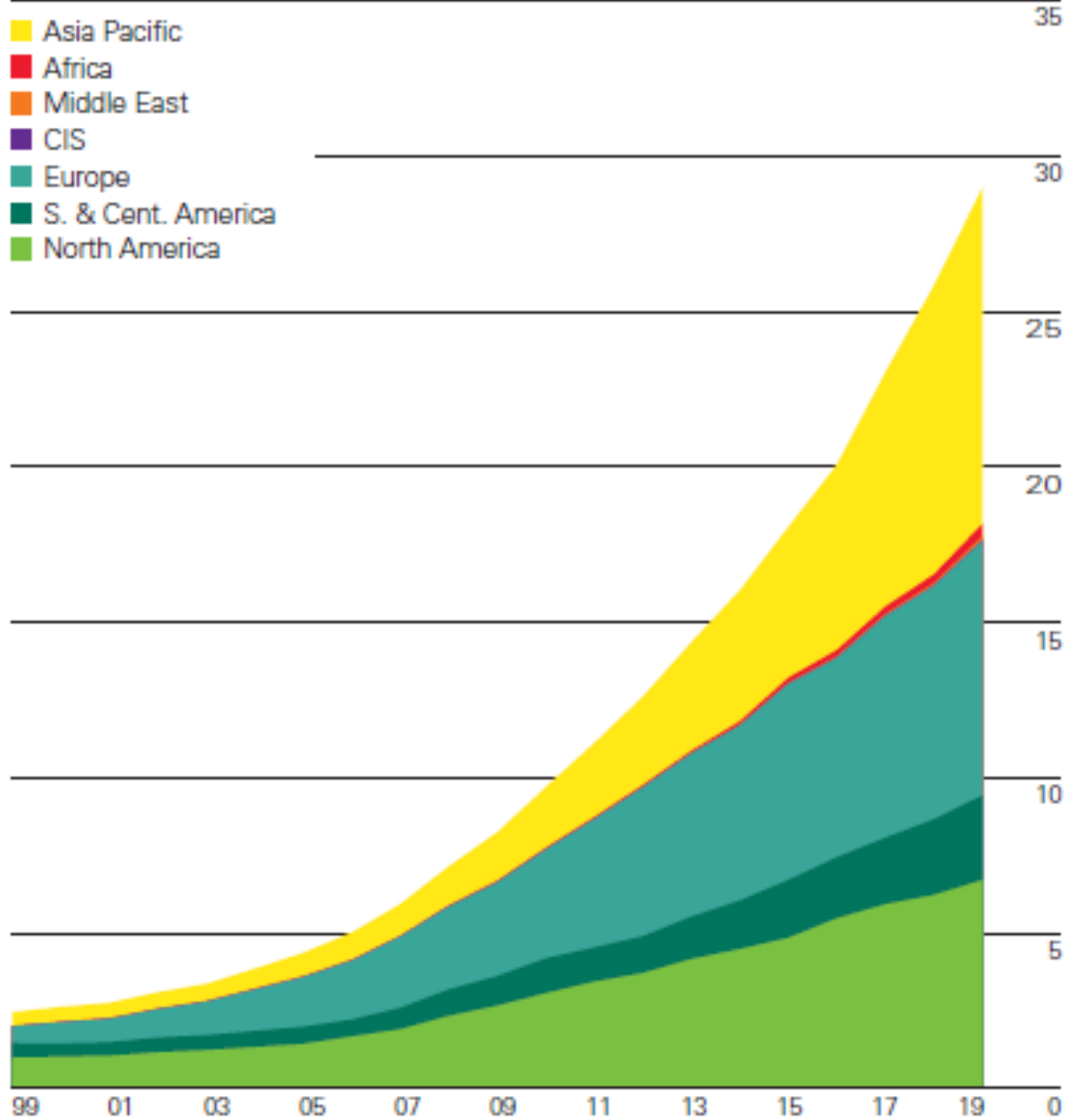


Carbon Emissions By Continent: BP Stats



Renewables consumption by region

Exajoules



Renewable
Consumption by
Region- BP Stats

NORTH AMERICA: U.S.

- Decided to withdraw from Paris Agreement, scheduled to leave by November 4, 2020, subject to the re-election of Trump in Presidential Elections.
- According to EIA, renewables are projected to grow but only up to 23% of US power generation by 2030 and 27% by 2050
- Falling carbon emissions are attributed to gas outcompeting coal in power generation
- US tariffs on Chinese solar panels hindering growth of new renewable capacity
- Climate policy and clean energy is extremely politicized where concern over climate change is split between party lines.
- Dismantling of climate and environmental policies by Trump administration.
- Some of Trump's policies include lack of investments in infrastructure and public transport, rolling back of vehicle efficiency standards and clean power plan and resurgence of coal power generation
- Joe Biden has proposed a \$2 trillion energy and climate plan aiming to decarbonize by eliminating coal and carbon pollution by 2035, with a focus on green job creation.
- No mention of carbon pricing and fracking ban in Biden's plan.

NORTH AMERICA: CANADA

- Canada has missed every emissions' target it has ever set. Oil and gas industries constitute majority of carbon emissions.
- Government aims to cut carbon emissions by 30% over 2005 levels by 2030 and get Canada to net-zero emissions by 2050.
- However, it provides the fossil fuel industry with \$16 billion in aid.
- Existence of National Carbon Tax since 2019 and investment in clean energy research.
- The government also bought the Trans Mountain Oil Pipeline Project to unlock pacific markets for Alberta oil sands for \$3.4 billion when the expansion was abandoned by the Texas-based Kinder Morgan- pointing to the contradictory approach of the government when it comes to climate action.
- Extreme vulnerability of indigenous communities to climate change and environmental racism in Canada deeply affect the clean energy transition.
- High environmental and social costs due to vulnerability.

SOUTH AMERICA

- More than quarter (32%) of South America's primary energy comes from renewables-> twice the global average, out of which hydropower alone constitutes 22%.
- Existence of dynamic renewable energy markets in the region especially in hydropower and biofuels
- It is the single most energy efficient region in the world
- Brazil, Mexico and Chile are ranked amongst top ten global renewable energy markets in terms of investment in 2015.
- Other countries like Costa Rica, Uruguay and Paraguay generate virtually all their electricity through renewables.
- Clean energy investment needs in the region are estimated at \$45 billion per year between 2020 and 2050.
- However, hydropower is becoming less reliable due to changing weather patterns like rain and droughts.
- Energy transition often leads to unequal distribution of costs and benefits in the region, especially for populations dependent on traditional energy infrastructure for livelihood.

EUROPE

- EU is fully committed to clean energy transition and decarbonization
- Impressive record of decarbonizing power systems through renewable energy technologies including offshore wind and solar PV, concentrating policy efforts towards transforming sectors like transport, industry and buildings while supporting energy system integration.
- CO2 emissions have been reducing 1.5% p.a. since 2008 and EU met the 2020 target of renewable energy constituting 20% of total energy consumption.
- Sweden, Finland, Latvia, Denmark etc. are on track with meeting 2020 renewable energy targets whereas Spain, France, Germany and Netherlands are not.
- Yet, EU is not on track to meet its 2030 target to reach 32% of renewable energy in the energy mix (currently at 19%)
- While share of renewables in electricity production reached 32% in 2018, deployment of energy efficiency mechanisms and use of renewables in sectors like transport, buildings and industry have been relatively slow.
- Aims to become the world's first climate-neutral continent by 2050.
- European Green Deal – ambitious package of 50 measures that will enable clean energy transition
- Reduced capacity to expand renewables after COVID-19 predicted + rebounding CO2 emissions

CIS

- Economies of the CIS are highly dependent on hydrocarbon revenues, especially Russia.
- Globally increasing renewable targets and energy transition towards low-carbon pathways are assumed to be threats to hydrocarbon revenues by Russia
- 83% power generation in Russia is supplied by fossil fuels. Russia is 4th in primary energy consumption and carbon dioxide emissions in the world.
- Instead of focusing on renewable energy sources, Russia is betting on gas as an energy transition fuel in Europe and Asia. Coal and gas is significantly cheaper in Russia in comparison with electricity from renewables
- Ambitious targets of expanding natural gas production- 750 bcma gas production and 250 bcma of exports by 2035.
- Russian Energy Strategy 2035- aiming at structural diversification, decentralization and digital transformation of the energy infrastructure.
- Russia also aims to diversify exports, increase investment in production of LNG, hydrogen and helium and rapidly modernize its FEC infrastructure.

AFRICA

- Key driver of global energy demand growth and a region with abundant reserves of fossil fuels, solar power and key minerals that will be vital for clean energy transitions worldwide.
- Although Africa produces 2% of global energy-related CO2 emissions, the continent will face massively disproportionate impacts of global climate change, owing to geographical characteristics.
- Energy demand growth in Africa is expected to grow twice as fast as the global average over the next 2 decades.
- The continent is not ready to meet its development needs while providing energy access to all under the current policy framework.
- Africa's Agenda 2063 has ambitious sustainable development goals which can allow Africa to become the first continent to develop its economy primarily by using renewables, natural gas and energy efficiency.
- Massive solar resources- the richest in the world- can be tapped
- Africa is home to major reserves of rare minerals like cobalt and platinum which are indispensable for clean energy technologies worldwide. (DRC and South Africa)
- Major issues in the next decade: tackling the lack of access to electricity and clean cooking in addition to securing a reliable electricity supply
- Natural gas discoveries can allow natural gas to emerge as the key driver of industrial growth

ASIA-PACIFIC

- Asia Pacific represented 37% of global renewables consumption and 40.9% of global renewable power generation in 2019 out of which 44% accounted for wind energy and 34% solar energy. However, 9% of electricity generation in APAC comes for renewables and coal constitutes a whopping 58% in the power mix, followed by hydroelectricity (14%) and natural gas (11%)
- China was the largest contributor to renewable growth in 2019.
- The most important region in the world in global energy transition due to its large population share and equally large share of industrial production
- China and India – key drivers of this transition due to rapidly increasing energy demand, population size, carbon emissions and economic growth.
- Rising concerns with respect to air pollution and carbon emissions in the region
- South East Asia is more conducive for renewable energy expansion due to advanced institutions and competitive energy markets whereas under-developed economies have limited institutional capacity to invest in clean energy transitions
- Other factors like agriculture, forestry and land use ranging from crops, livestock and deforestation constitute 24% of global carbon emissions and it is these aspects that Asian countries could pay attention to in the future
- China's technological advances in renewable energy sector makes it necessary for other countries to invest and cooperate with China in research and development of renewable energy sources, giving China considerable edge in global markets.
- COVID-19 is likely to slow down the pace of energy transition in the region due to post-COVID economic recovery programs

MIDDLE EAST

- Despite its over-dependence on rents from fossil fuels, the Middle East is inclined towards bringing forth a sustainable energy transition due to associated benefits like economic development and diversification, water security, job creation and a healthier balance of trade.
- High volatility of oil prices in the international arena, reinforced by the COVID-19 pandemic that brought the global energy markets to a standstill, have forced the oil dependent nations in this region to try diversifying their economies
- Saudi Arabia and UAE are particularly committed towards increasing the region's stake in renewables to curb climate change. Abu Dhabi has considerably scaled up investment in wind and solar energy.
- The demand for fossil fuels is expected to remain the same, if not more, even if the world is moving towards renewables. Thus, instead of solely expanding wind and solar capacity, the middle eastern countries can invest in other decarbonization technologies like replacing fossil fuel powered desalinating plants with renewable powered ones in addition to investing in hydrogen economy and CCUS to enhance oil recovery.
- Saudi Vision 2030: aimed at partially privatizing Saudi Aramco to generate revenue and decrease the kingdom's dependence on oil exports. A plan to build the Neom megacity run on 100% renewable energy + a \$28 billion renewable energy development program implemented in 2019.
- Ambitious targets for renewables : Pan Arab Clean Energy Initiative aims to reach a combined 80 GW of renewable capacity by 2030
- COVID-19 has led to the diversion of economic resources towards public expenditure and a cut-back in investment projects by state-owned enterprises. Energy transition in the middle east is thus, likely to take a back-seat in the short to medium term.