

LEARN & ACT

Sustainable Energy



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A photograph of a dimly lit train station. The scene is dark, with people walking through the station. There are digital signs and a clock visible. The text is overlaid on the left side of the image.

Our daily life and energy
Daily life paralyzed
by large-scale power outage



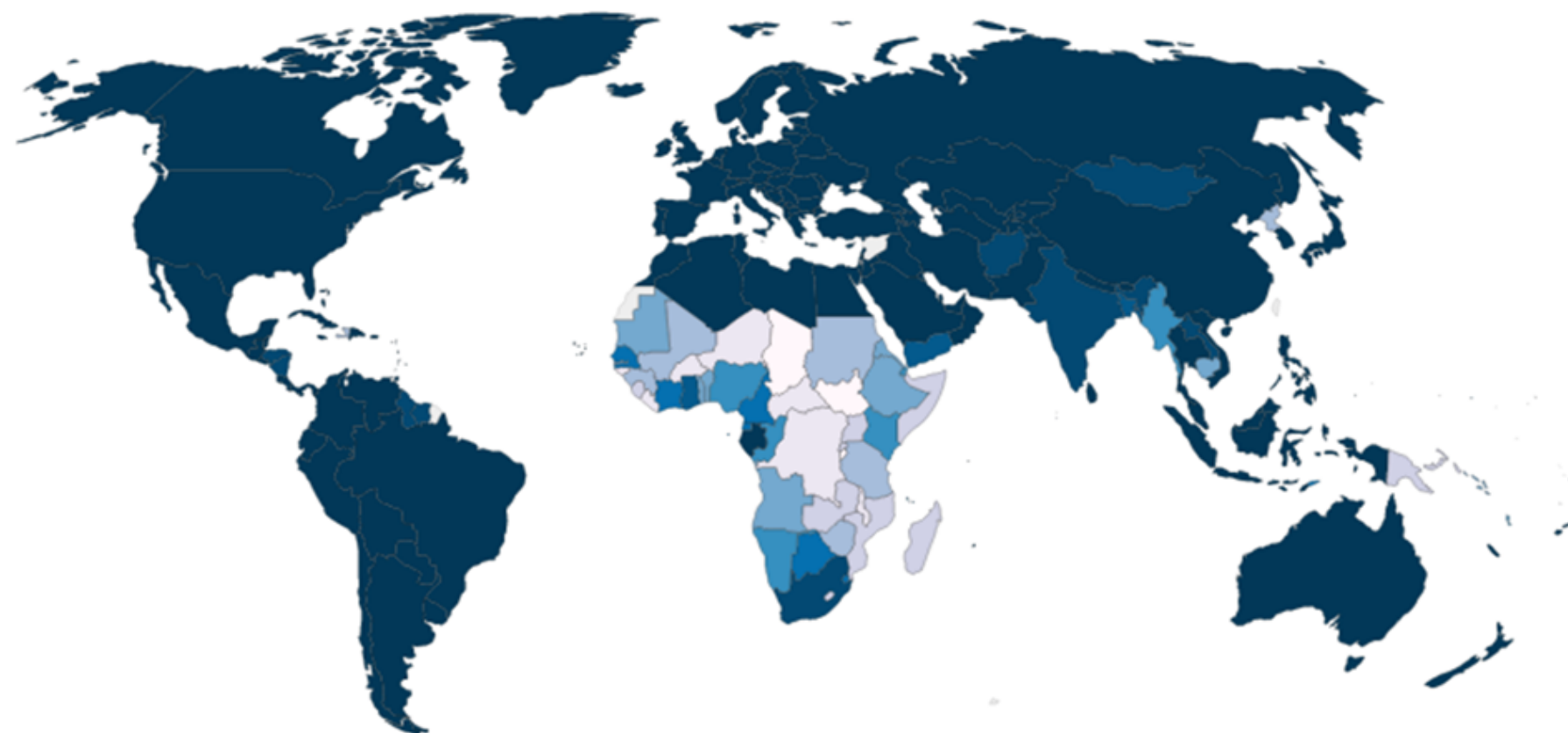
Living with Energy, the Other Side

Which countries in the world have less access to electricity?

Electricity access, 2016

Share of the population with access to electricity.

Our World
in Data



Source: World Bank

[OurWorldInData.org/energy-access](https://ourworldindata.org/energy-access) • CC BY

| Global warming caused by fossil fuels

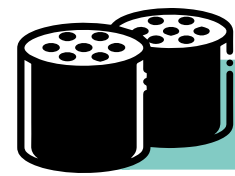
- People who lack energy

01. Energy and Human Development

| What is Energy?

Energy refers to the force that enables an object to move or do work.

| Energy and Human Development



Coal

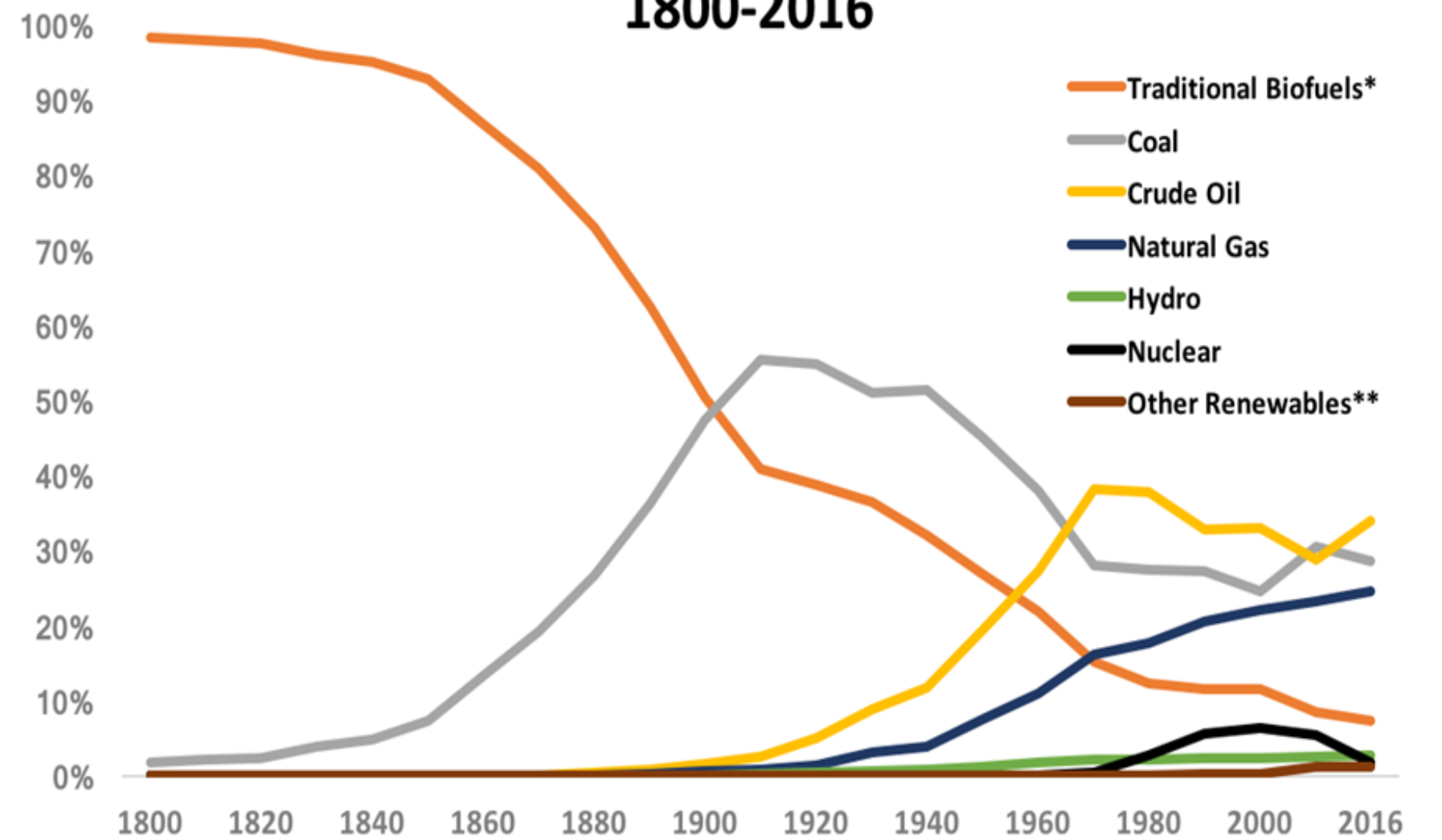


Oil



Renewable energy

Share of Global Primary Energy Mix, 1800-2016



Data Source: Vaclav Smil (2017), *Energy Transitions: Global and National Perspectives*

Notes: *Burning wood and other organic matter

**Wind, solar and modern biofuels

©crystolenergy.com

02. What is fossil energy?

| What is fossil energy?

Fossil fuels are fuels made by the remains of animals and plants buried in the ground long ago, which accumulated underground with heat and pressure

Ex) Coal, oil, and natural gas

-Fossil fuels, decreasing reserves

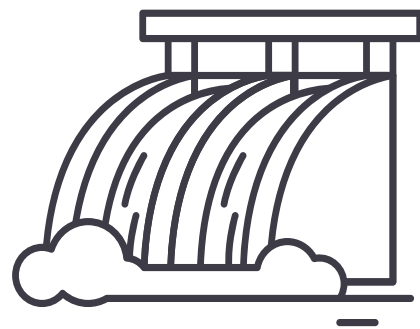
-Greenhouse gas emitted by fossil fuels
Fossil fuels = non-renewable energy



| What is renewable energy?

Renewable energy refers to the energy that does not cause pollution in the process of utilization and that can be supplied indefinitely even if steadily consumed.

63%



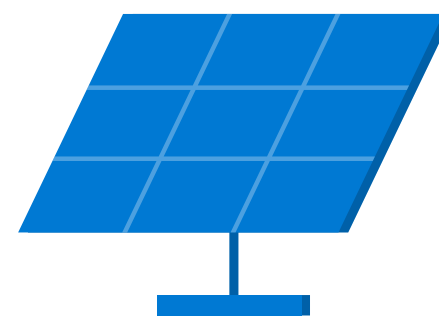
Hydroelectric power

19%



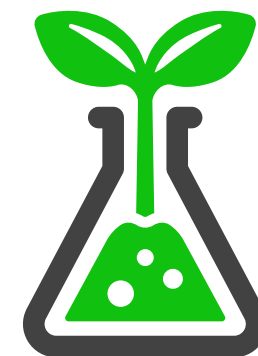
Wind power

9%



Solar heat and solar power

8%

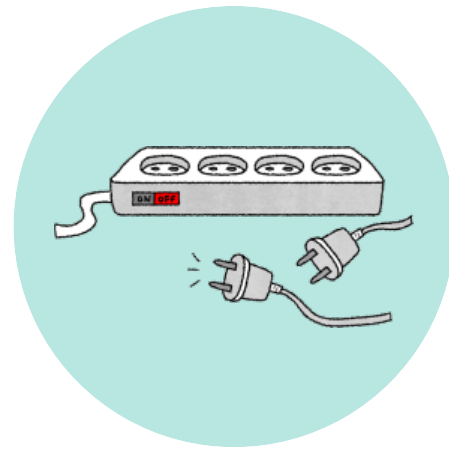


Biomass

73% of greenhouse gases

➔ generated by fossil energy

Energy Inequality



800 million people live without electricity



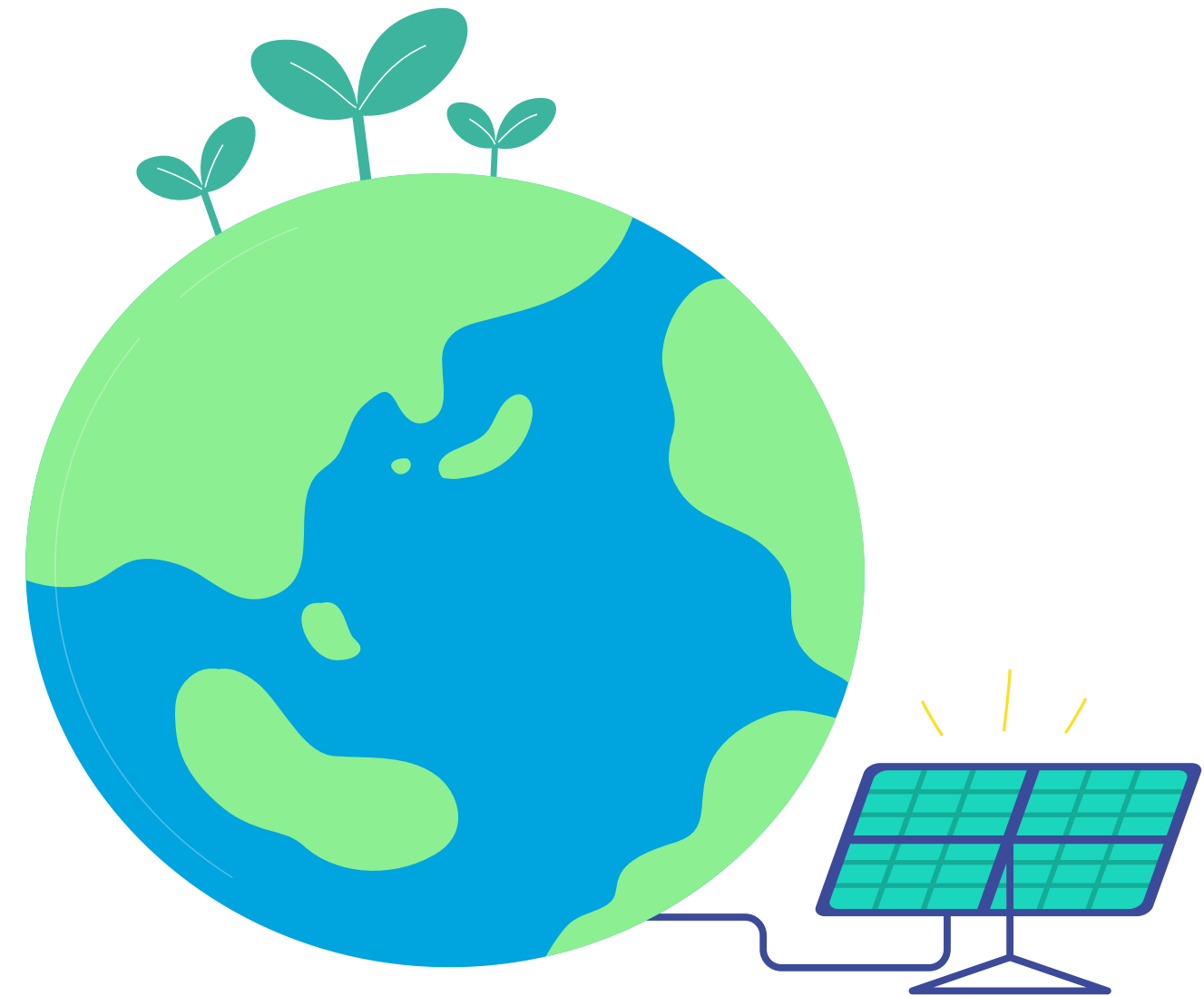
2.8 billion people use harmful energy



4.3 million people a year die from low-quality energy

04. Global Energy Status (2) (Source: UN)

01. Increasing energy efficiency can reduce greenhouse gases by **40%**
02. Renewable energy produces **17.5%** of the world's electricity
03. Creation of jobs through renewable energy, **18 million**

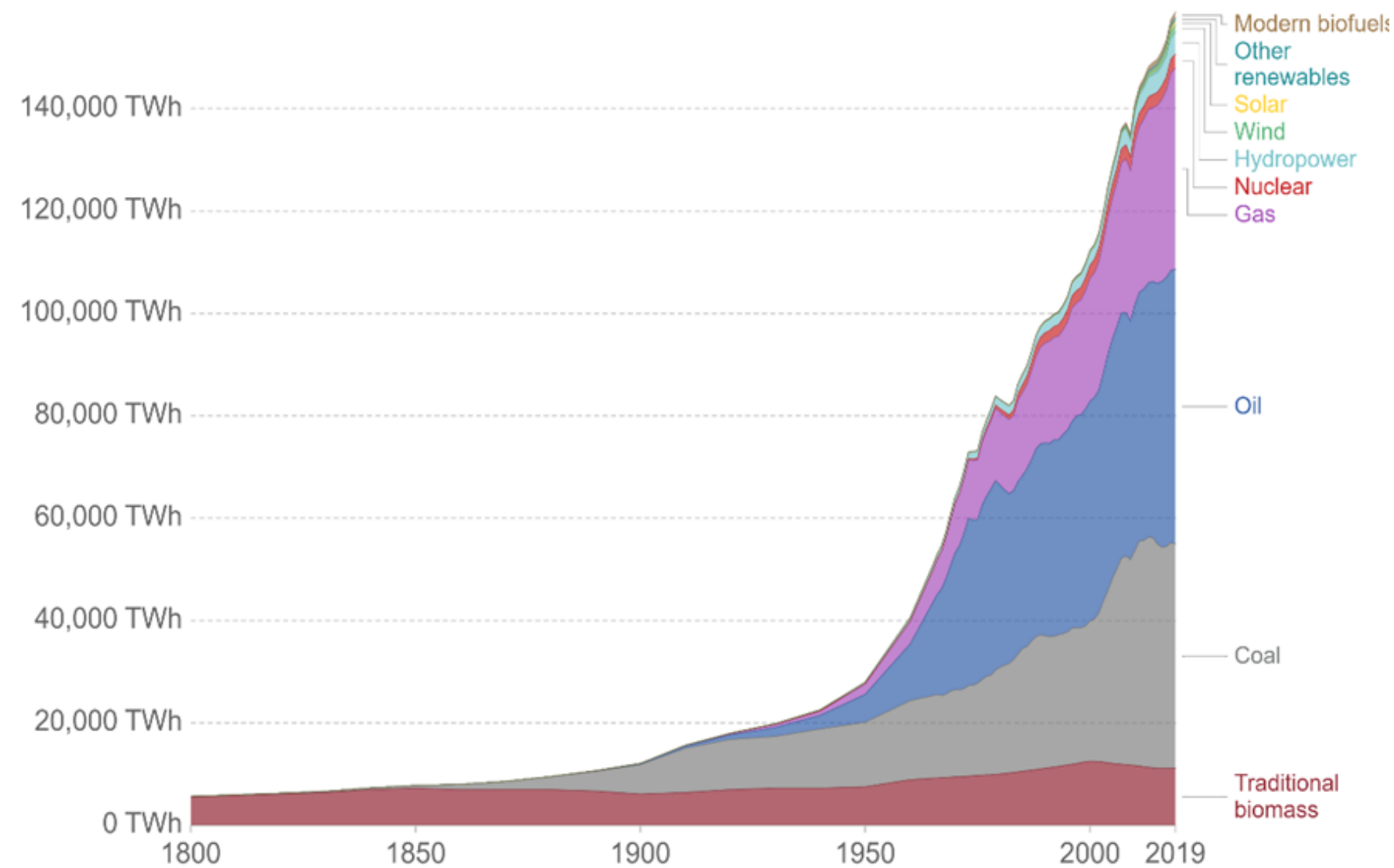


05. Causes of the Global Energy Crisis

Global direct primary energy consumption

Direct primary energy consumption does not take account of inefficiencies in fossil fuel production.

Our World in Data



Source: Vaclav Smil (2017) and BP Statistical Review of World Energy

OurWorldInData.org/energy • CC BY

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01. Rapid increase in energy demand

02. Habits of wasting energy

03. Old power generation infrastructure

06. International Goals for Sustainable Energy Production



| SDGs #7 “Sustainable and clean energy”

“Sustainable and clean energy”

means energy such as solar power and wind power that we can continue to use without depletion and that does not emit pollutants

06. International Goals for Sustainable Energy Production

| SDGs Indicators

7.1 Ensure universal access to affordable, reliable, and modern energy services by 2030.

7.2 Significantly increase the share of renewable energy in the global energy mix (diversification of energy sources) by 2030.

7.3 Double the global rate of improvement in energy efficiency by 2030.

7.a. By 2030, strengthen international cooperation to promote access to clean energy research and technological development, including renewable energy, energy efficiency, advanced and cleaner fossil fuel technologies, and investment in energy infrastructure and clean energy technologies.

7.b. By 2030, develop technologies and expand infrastructure to provide modern and sustainable energy services to all in accordance with national support programs in developing countries, particularly least developed countries, small island developing countries, and landlocked developing countries.



07. The Most Important Thing for Sustainable Energy Use

- Transition to renewable energy that can be self-sufficient
- Resolving environmental and resource depletion problems
- International cooperation for the development of renewable energy

| 1. Campaigns



Pursuit of carbon neutrality

Carbon neutrality is the concept of making carbon dioxide emissions “zero.”



RE100 Campaign

The goal of supplying 100% of the electricity used by businesses with renewable energy by 2050

| 2. International Organizations

1) International Energy Agency (IEA)

Preparation of rational energy policies, and cooperation in energy technology among countries



2) International Renewable Energy Agency (IRENA)

Strengthening international cooperation for the development and supply of renewable energy



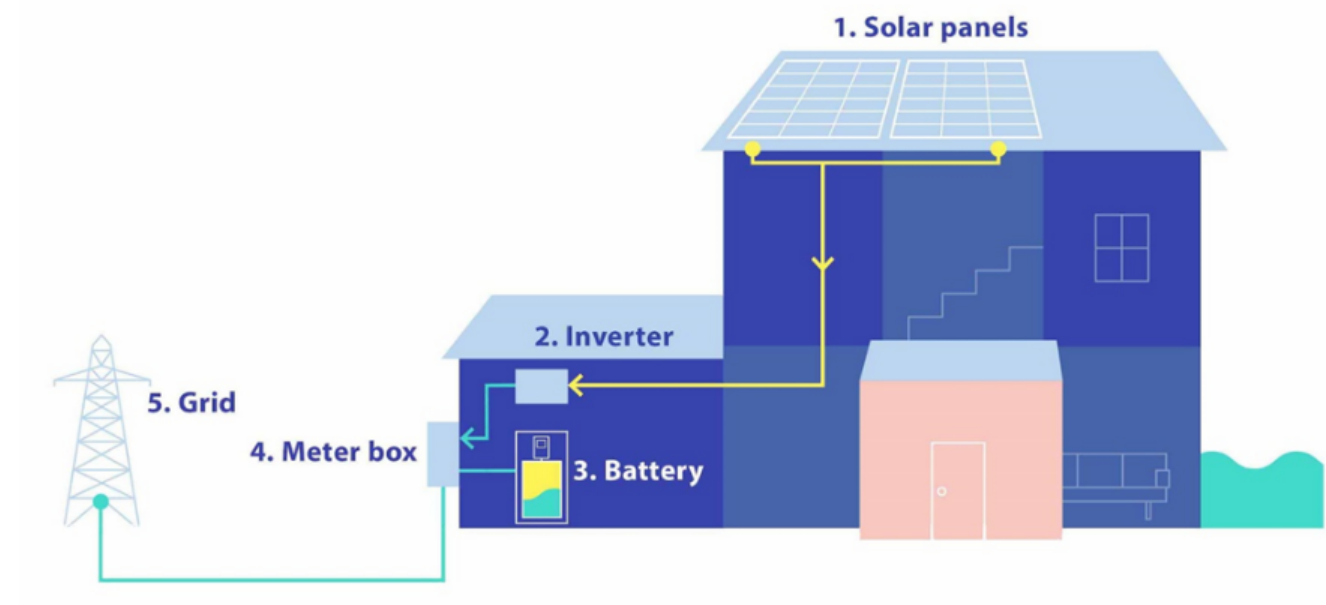
| 3. Various Ideas

1) Micro-Grid

“Small-scale independent power system” for self-sufficiency in the production and consumption of electricity in individual buildings, remote areas, and independent industrial complexes

2) African Clean Energy (ACE)

High-efficiency stove using biomass fuel



©African Clean Energy_eepafrica.org




How can we contribute to a more sustainable energy future?

 < Renewable Energy 101 >
National Geographic



<https://youtu.be/1kUE0BZtTRc>

 How we can make energy more affordable for low-income families.



https://www.ted.com/talks/deandra_salvador_how_we_can_make_energy_more_affordable_for_low_income_families



THANK YOU