7 AFFORDABLE AND CLEAN ENERGY
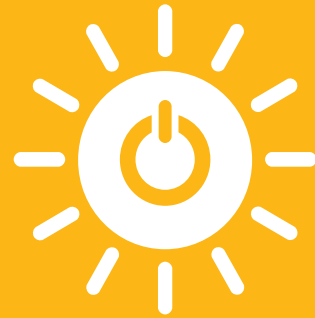
Access to affordable & sustainable energy for all

Artificial Intelligence for Affordable and Clean Energy

SDG 7 is the only goal where no targets are regressing, and 2 out of 5 targets are currently on track. However, despite this progress, most energy consumed globally is still derived from non-renewable sources, and hundreds of millions of people remain unconnected to the energy grid.

According to the UN, at the current rate, 660 million people will still lack electricity, and 1.8 billion will not have access to clean cooking fuels and technologies by 2030.

The relationship between SDG 7 and AI presents a paradox.

While AI has the potential to contribute to the achievement of SDG 7, its substantial energy requirements pose a significant challenge to this Goal. There are numerous AI UN use cases that align with SDG 7 objectives, in the various repositories: 4 use cases out of 40 in AI for Good: Innovate for Impact, and approximately 50 use cases out of 408 in the UN Activities on AI.

AI use cases for energy include the development of a smart grid, where energy can be optimized to enhance system efficiency and reduce energy waste. Additionally, AI can be used in data management processes to minimize the energy required for specific tasks or schedule them at times when less energy is needed. This is critical as data storage is projected to contribute to 14% of the world's emissions by 2040.

AI can play a crucial role in exploring new energy solutions and materials, such as driving advancements in nuclear fusion and identifying more efficient photovoltaic materials. Furthermore, AI can optimize the production of renewable energy, addressing the unpredictability of sources like wind and solar power. The adoption of AI technology has led to a significant increase in energy consumption.

AI servers, if operating at full capacity, would consume at least 85.4 terawatt-hours of electricity per year, surpassing the annual energy usage of many small countries.

Using this large quantity of energy could make it a challenge to achieve the targets related to SDG 7. This substantial energy demand poses a challenge to achieving the targets of SDG 7, particularly impacting poorer communities' access to affordable energy & their ability to use renewable energy over fossil fuels.

Key Considerations for Stakeholders

- **Impact assessment:** Align AI use case development and incentives with OECD AI principles to maximize sustainable value creation. The objective is to prioritize governmental tools for AI use cases related to the SDGs.

- **Technology improvement:** Prioritizing technologies with lower energy requirements is crucial to support the development of SDG 7 by reducing overall energy consumption.

Impact

According to a study on the impact of AI on SDG 7. AI could act as an (positive) enabler for 100% of the targets and act as an inhibitor (negative) for 40% of the targets.

Use case 1

Using AI to optimize the supply and demand of the energy grid to improve efficiency and minimize waste.

Use case 2

Implementing AI solutions for data centers to reduce the overall energy impact of data processing or storing.

Use case 3

Focusing on AI solutions to develop more efficient materials for energy production, such as photovoltaic cells.

GOALS

SDG 7: Affordable and clean energy

Ensure access to affordable, reliable, sustainable and modern energy for all

7 AFFORDABLE AND CLEAN ENERGY

📊 FACTS AND FIGURES

- The global electricity access has risen from 87% in 2015 to **91% in 2021**, but **675 million people**, primarily in LDCs and sub-Saharan Africa, **remain without access**.

- In 2021, **71% of the global population** had access to clean cooking fuels and technologies, up from 64% in 2015. The region with **the lowest access rates** was **sub-Saharan Africa**, where progress towards clean cooking has failed to keep pace with growing populations, leaving a total of **0.9 billion people without access in 2021.**

- The share of renewable sources in total final energy consumption increased from 16.7% in 2015 to **19.1% in 2020**, with **the electricity sector** leading the way at 28.2% and driving most of the renewable energy growth, while progress in **the heat and transport sectors** has been limited in the past decade.

- The rate of improvement in primary energy intensity dropped to **0.6% in 202**0. This makes it the worst year for energy intensity improvement since the global financial crisis. **To make up for lost time, energy intensity improvements will need to average 3.4% per year until 2030**.

- International public financial flows for clean energy in developing countries have declined consistently, even before COVID-19. In 2021, they reached **$10.8 billion**, down by nearly 12% from 2020. This represents **a 35% drop** from the decade-long average of 2010-2019 and less than half of the peak in 2017 at $26.4 billion.

- In 2021, developing countries achieved **a record-breaking installation of 268 Watts per capita of renewable energy-generating capacity**, growing at a rate of **9.8%**. Progress has been significantly slower for Small Island Developing States, Least Developed Countries, and Landlocked Developing Countries.
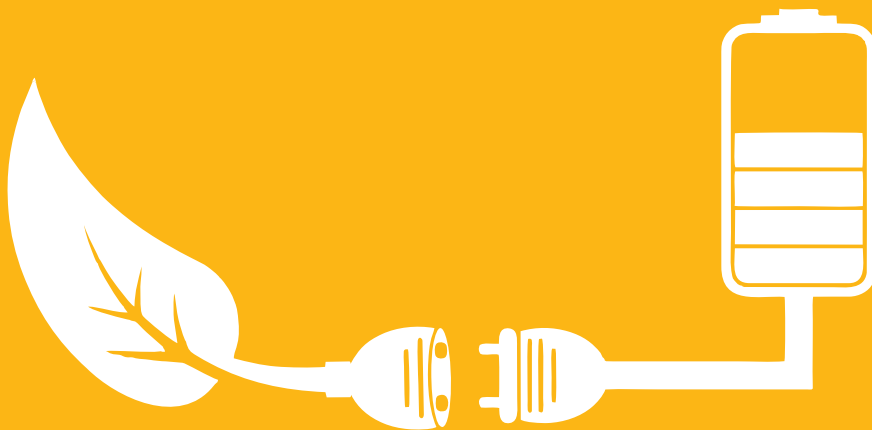
🔍 WHERE WE STAND

- While progress has been made in improving access to electricity and clean cooking fuels globally, **675 million** people remain unconnected to grids and **2.3 billion** continue to rely on unsafe and polluting fuels for cooking.

- Renewable sources power **nearly 30% of energy consumption in the electricity sector,** but challenges remain in heating and transport sectors.

- If the current trend persist, about **660 million** people will still lack access to electricity and **close to 2 billion** people will continue to rely on polluting fuels and technologies for cooking by 2030.

Global Youth AI Advisory Body