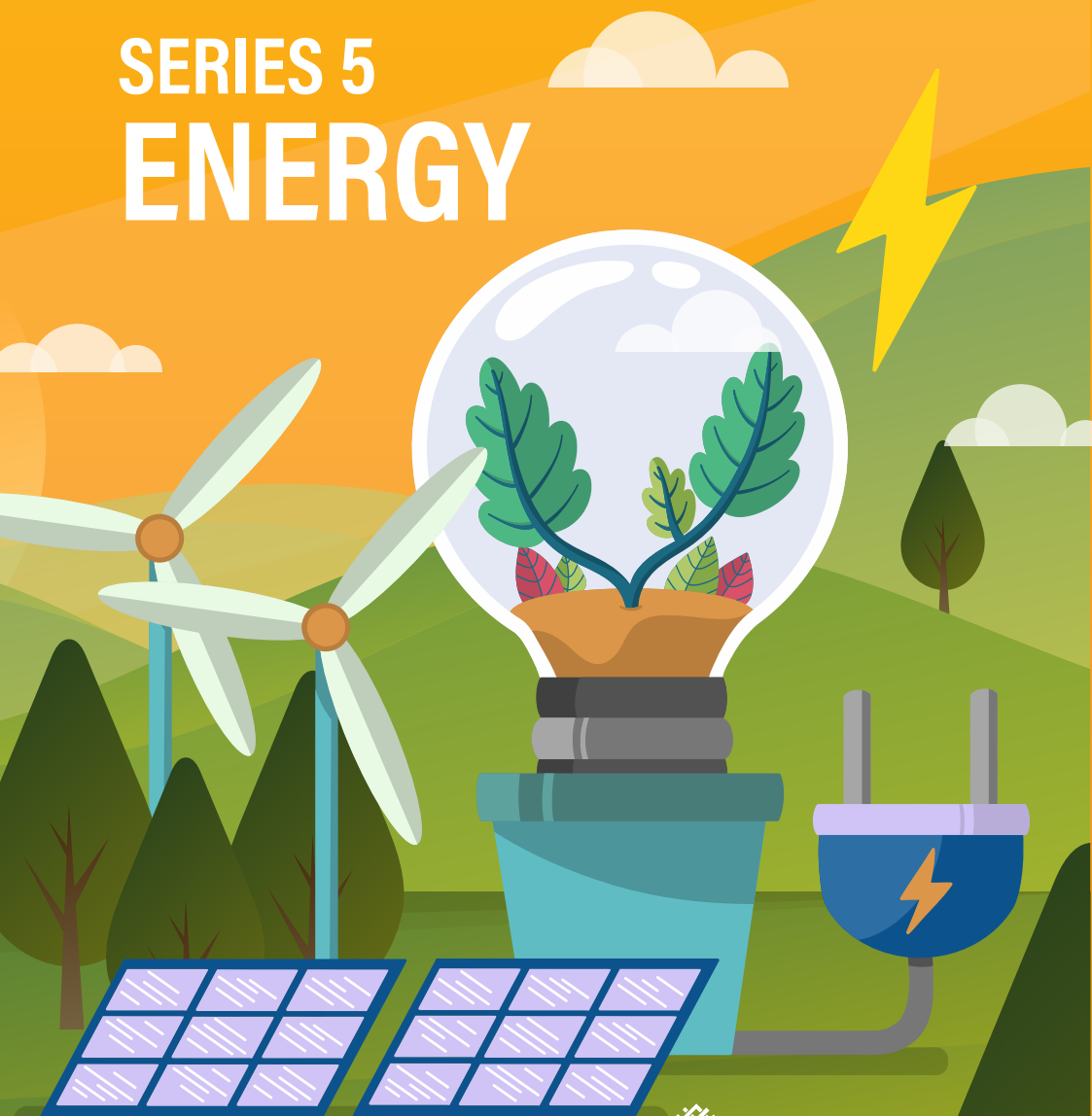


SUSTAINABILITY BOOKLET

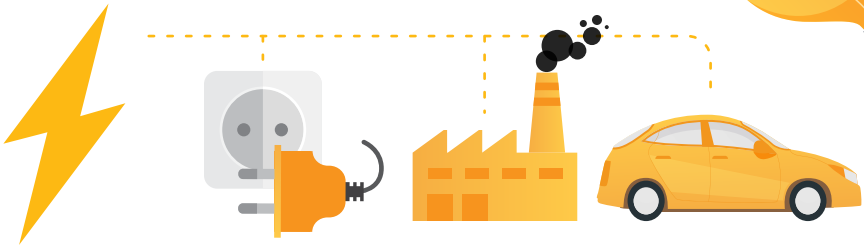
SERIES 5 ENERGY



WRI INDONESIA

Humans depend on energy to live.

Energy powers our electricity, industry, mobility, and much more.

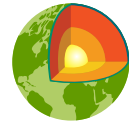
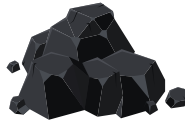


Today, when we use electricity at home, for instance, the electrical power is probably generated by

burning coal,

natural gas,

geothermal heat



to name just a few sources.

Energy sources could be categorized as **renewable** and **non-renewable**.

Renewable energy is harnessed from so many natural different natural sources or processes that are constantly replenished. For example:

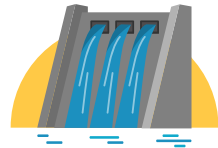
Heat of sunshine ▶ **Solar energy**



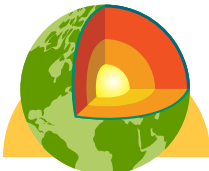
Moving air ▶ **Wind energy**



Movement of the water ▶ **Water energy**



Heat of the earth ▶ **Geothermal**



Organic material, which could be anything derived from plants or animals. ▶

Biomass





Non-renewable energy sources, on the contrary, can't be replenished. Once they are used, they are gone forever. These sources are formed over millions of years by animals, creatures and dead plants that were gradually buried by layers of layers of rocks and soils. When we use these sources for energy, they release greenhouse gas emission and lead to air pollution. For example:

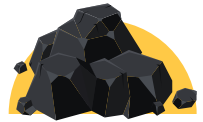
Crude oil



Natural gas

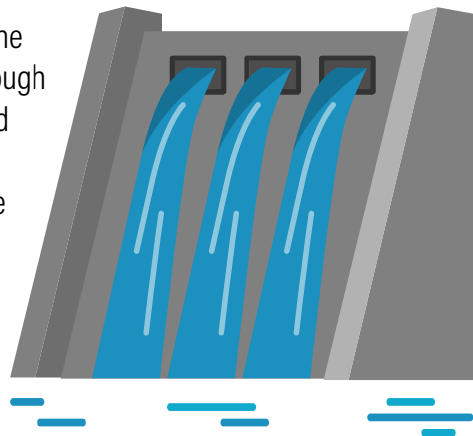


Coal

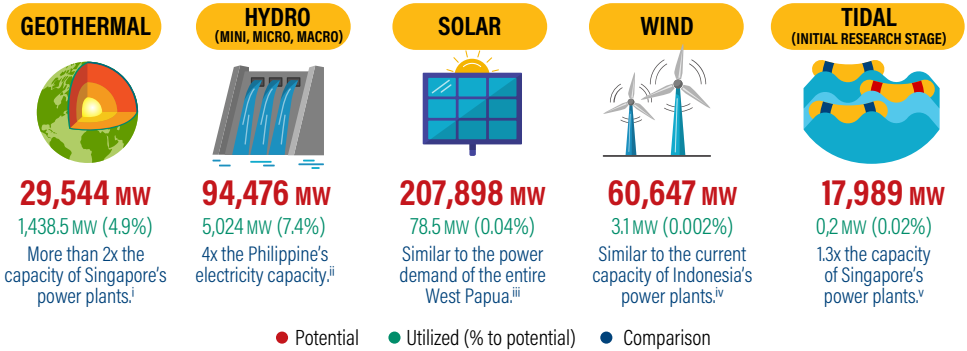


Hence, using renewable energy sources is better for us, for our place of live, and for future generations, especially given that energy is the second most contributing sector of greenhouse gas emission in Indonesia.

However, we need to be careful when developing the renewable energy generator. For example, even though dam could derive renewable energy from water and release no pollution, without a careful assessment, a large dam could hurt the ecosystem including the fishes, the water plants, and the nature of river. Hence, a smaller water dam with careful environment and ecological assessment would be a better choice than a large dam.



NOW, LET'S SEE THE POTENTIAL OF RENEWABLE ENERGY IN INDONESIA.



CLEAN ENERGY

Lately, people come up with a new definition of energy, known as clean energy. Usually, when clean energy is being discussed, people would refer to the inclusion of natural gas and nuclear power.



NATURAL GAS

Indonesia has plenty of natural gas which can be used as transition fuel before we fully utilize renewable energy.

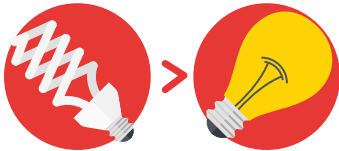


NUCLEAR

As for nuclear, there is a high risk associated with its development due to Indonesia's frequent earthquakes and its high cost.

ENERGY EFFICIENCY

Energy efficiency means using less energy for the same service. For example, we can use fluorescent bulb as opposed to incandescent light bulb to light a room.

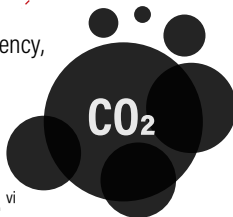


Changing the design of a room to have more natural light coming in is also a form of energy efficiency as we use less electricity to light the room.

With limited access to renewable energy and ineffective energy efficiency, energy consumption will release

800 MILLION TONS

of carbon dioxide in the air by 2020. ^{vi}



That is equal to greenhouse gas emissions from driving

154 MILLION

passenger vehicles for one year!



They say, clean and renewable energy sources are expensive, but the fact is, their prices keep falling.



Take solar as an instance. In 2016, two companies in Abu Dhabi bid a solar tender

for **Rp 338/kWh**



This bid is **less than half of the 'headline' cost of coal**, or the original costs before externalities such as health and environmental degradation are considered.

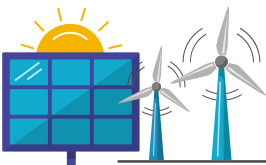
Additionally, International Renewable Energy Agency (IRENA) predict that there will be a significant shift in energy paradigm, and **global renewable energy price will be as competitive as coal headline price by 2020.**



Investors and governments across the globe realize the change in the energy market.

Even in China, where coal was once the king of energy resource, the government recognized the importance of transitioning to clean energy.

In January 2018, for the first time ever, China's National Energy Administration established a mandatory target to reduce coal energy consumption and set a goal for clean energy to meet 20% of China's energy needs by 2030.



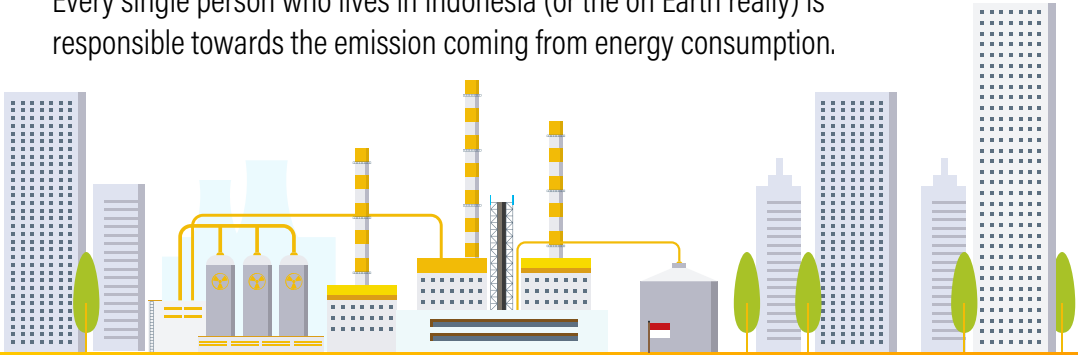
With this objective, the country's wind and solar sectors would, at minimum, attract as much as

\$782 BILLION IN INVESTMENT between 2016-2030.

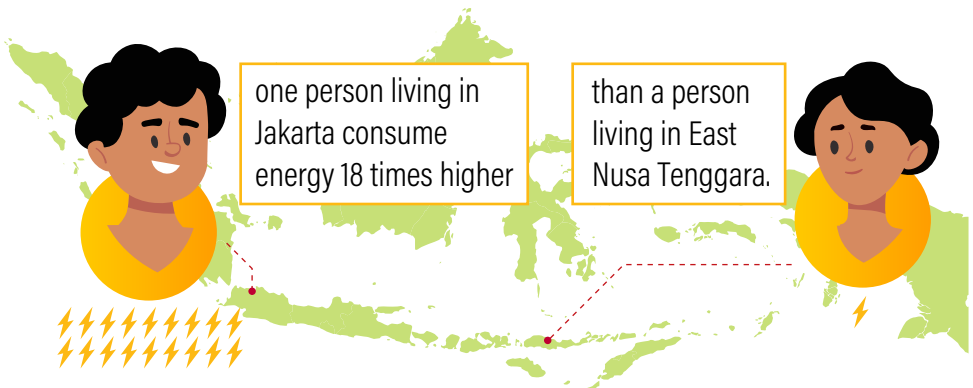
WILL INDONESIA BE PART OF THIS SHIFT? IT REALLY DEPENDS ON US.

WHO'S RESPONSIBLE?

Every single person who lives in Indonesia (or the on Earth really) is responsible towards the emission coming from energy consumption.



However, not everyone is equally responsible. According to PLN,



Different access to energy resulted in different amount of carbon to release. **The more energy we use, the more emission we produce.** Hence, the old saying "hemat energi hemat biaya" could be reiterate as "hemat energi hemat emisi, hindari krisis di bumi".



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ⁱ Source: "Singapore Energy Statistics" by The Energy Market Authority of Singapore, 2018

ⁱⁱ Source: Department of Energy of Philippines, 2018

ⁱⁱⁱ Source: "Statistik Ketenagalistrikan 2017" by Indonesia's Ministry of Energy and Natural

^{iv} Resources, 2018

^{iv} Source: "Statistik Ketenagalistrikan 2017" by Indonesia's Ministry of Energy and Natural Resources, 2018

^v Source: "Singapore Energy Statistics" by The Energy Market Authority of Singapore, 2018

^{vi} Source: "Energy sector biggest emissions emitter" from thejakartapost.com, published on July 28, 2015



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