Pollution kills more than 230,000 Indonesians per year: Report

Ardila Syakriah
The Jakarta

Air quality in M'sia getting worse

NATION

Sunday, 12 Jan 2020
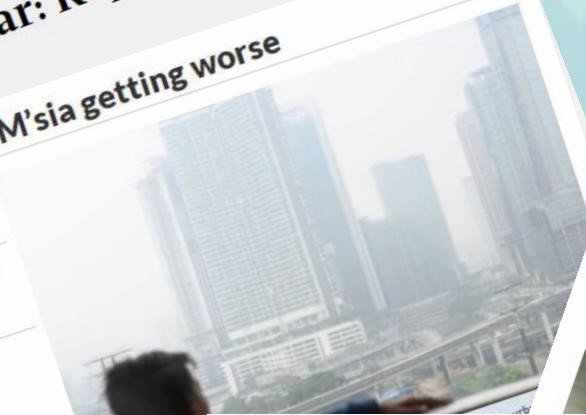
Grey skies: Exp...
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Gasp! Air pollution in Jakarta and H... is now worse than in Beijing, global study reveals

While air quality in China improves, Southeast Asia's air is becoming ...
breathable as a result of urbanisation, coal burning and forest fires.
Nowhere is the air as suffocating a...
improvement ...

...ere are signs of
...art to respond to

Southeast Asia on energy path for 650,000 premature deaths from air pollution by 2040: IEA

Energy demand is booming, but govo...
reliance on oil, gas and coal. A...
renewables deploym...

al continued
...d to improve
...new report.

Asean faces key challenge: Go green or choke on air pollution, says US energy specialist

Go on an SG55 tour to
support freelance guides

ST VIDEOS

Putin critic Alexei Navalny
fights for life, aides suspect
poisoning

EU rejects Belarus vote

Cleaner energy towards sustainable cities

Implementing more sustainable energy sources for more sustainable and resilient cities

Abdul Hakim bin Mohammad Ridzuan
Ak Mohd Hamizan bin Pg Haji Md Sufri

Introduction

1. Economic Activity (Increase in GDP)

2. Urbanization

3. Energy Use

Source: Our World in Data, Reuters

Introduction

Relationship between Electrical consumption (kWH per capita) and GDP per capita per country from 2000-2014
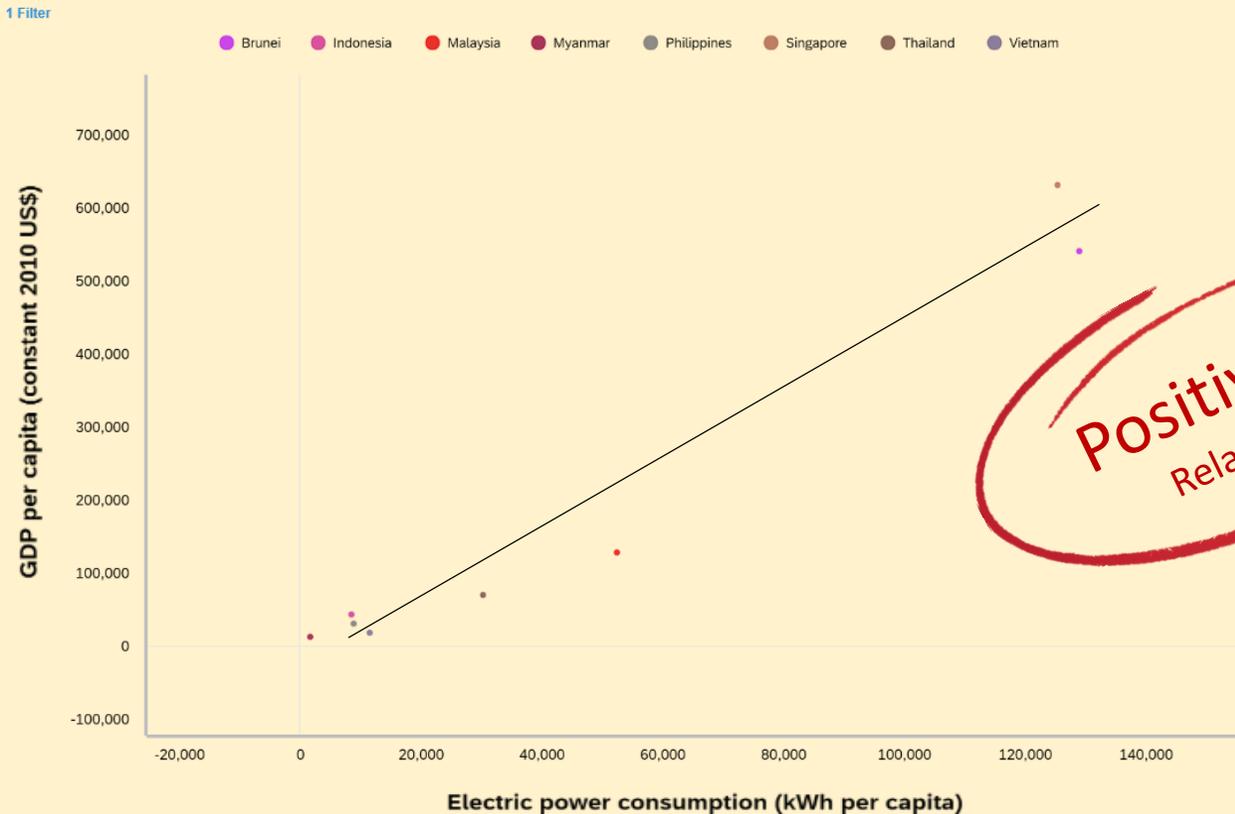
Forecasted number of population in Urban areas by country from 2000-2050

Positive Relationship
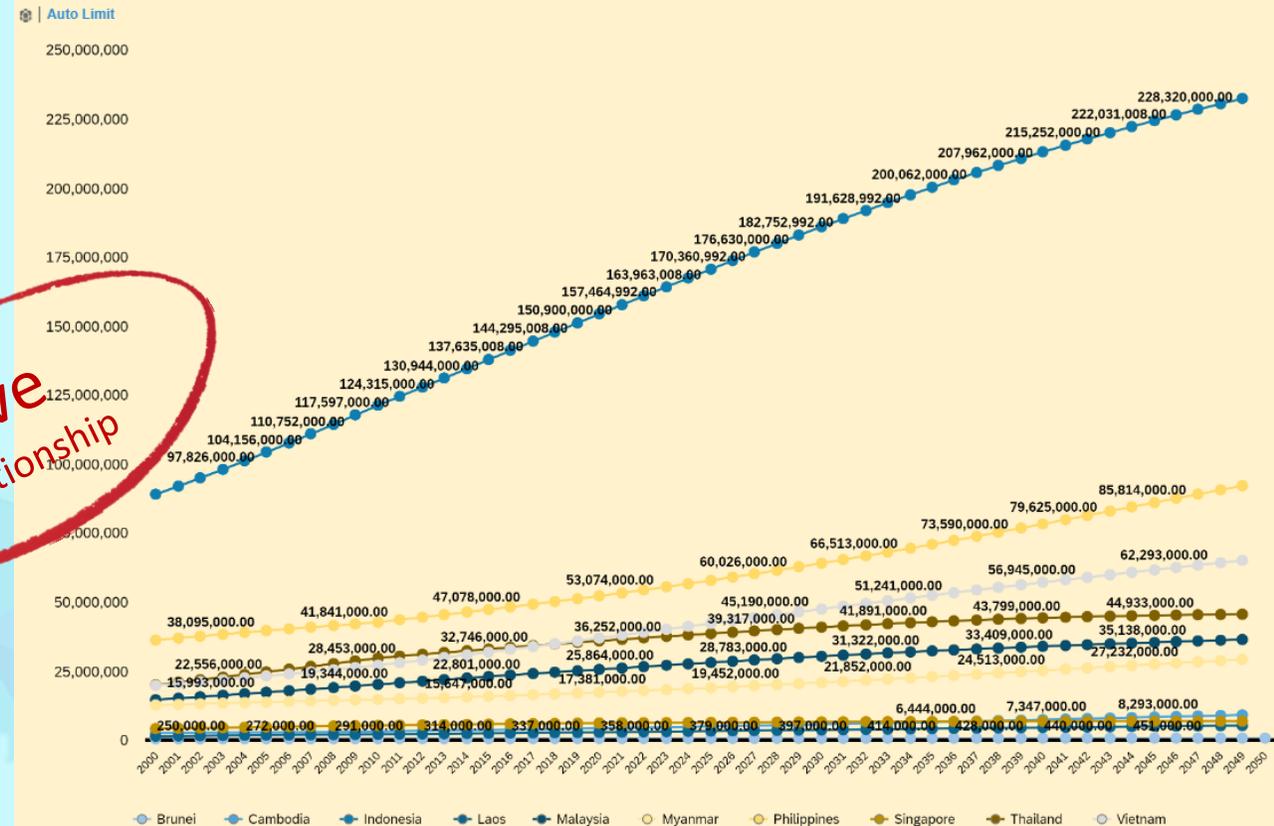
Scarcity Vs Renewables

% of Total electricity production from oil, gas and coal sources by Country
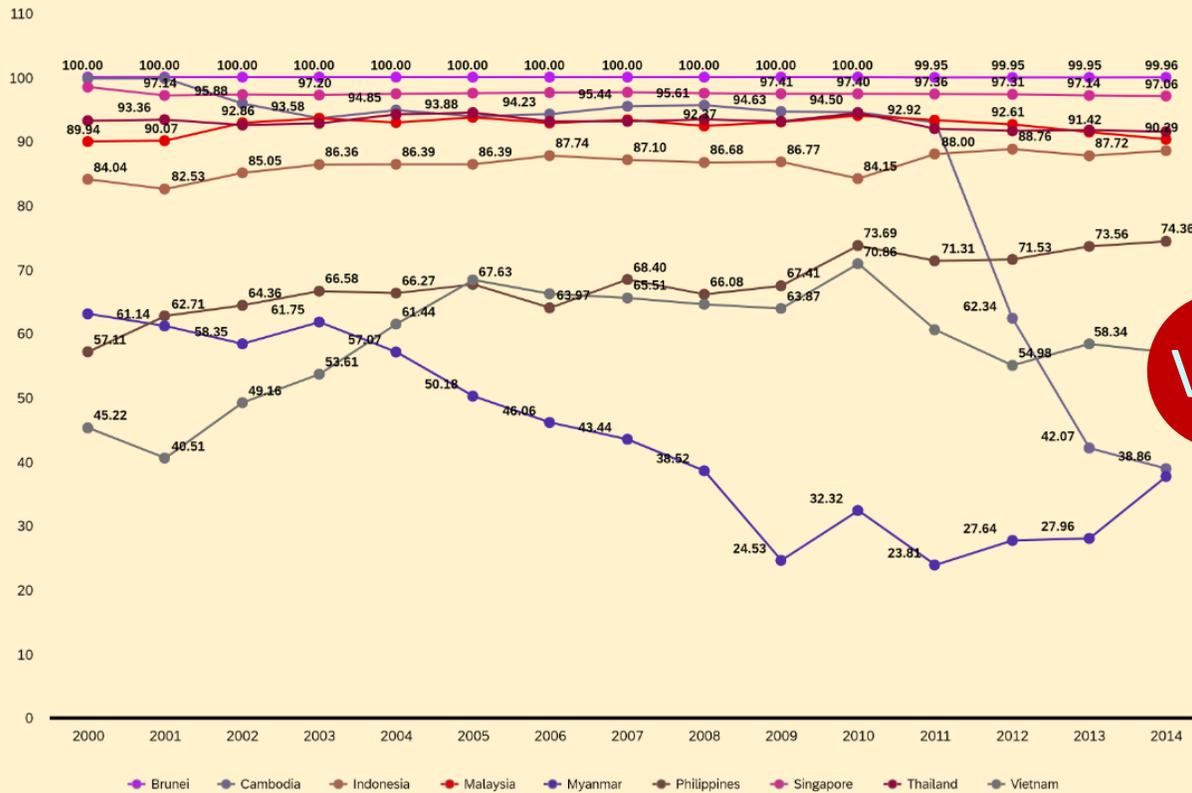
% of Total electricity production from renewable resources by Country

VS

Source: Our World in Data
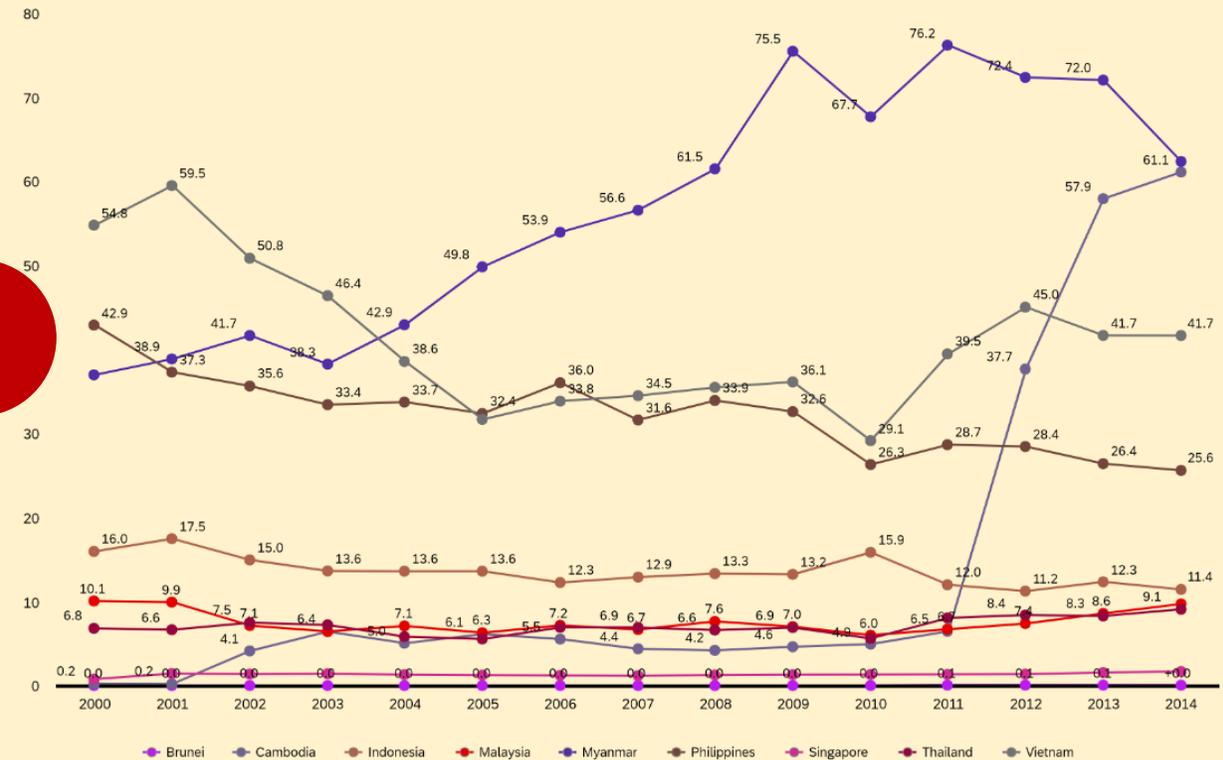
Scarcity Vs Renewables

Based on the data that we discovered, majority of ASEAN countries are **very dependent** on **scarce resources (Oil, Gas and Coal)** to generate electricity.

Source: Our World in Data

Non-Renewable will result in CO2 Emissions

Relationship between CO2 Emission per capita and Electricity Consumption per capita
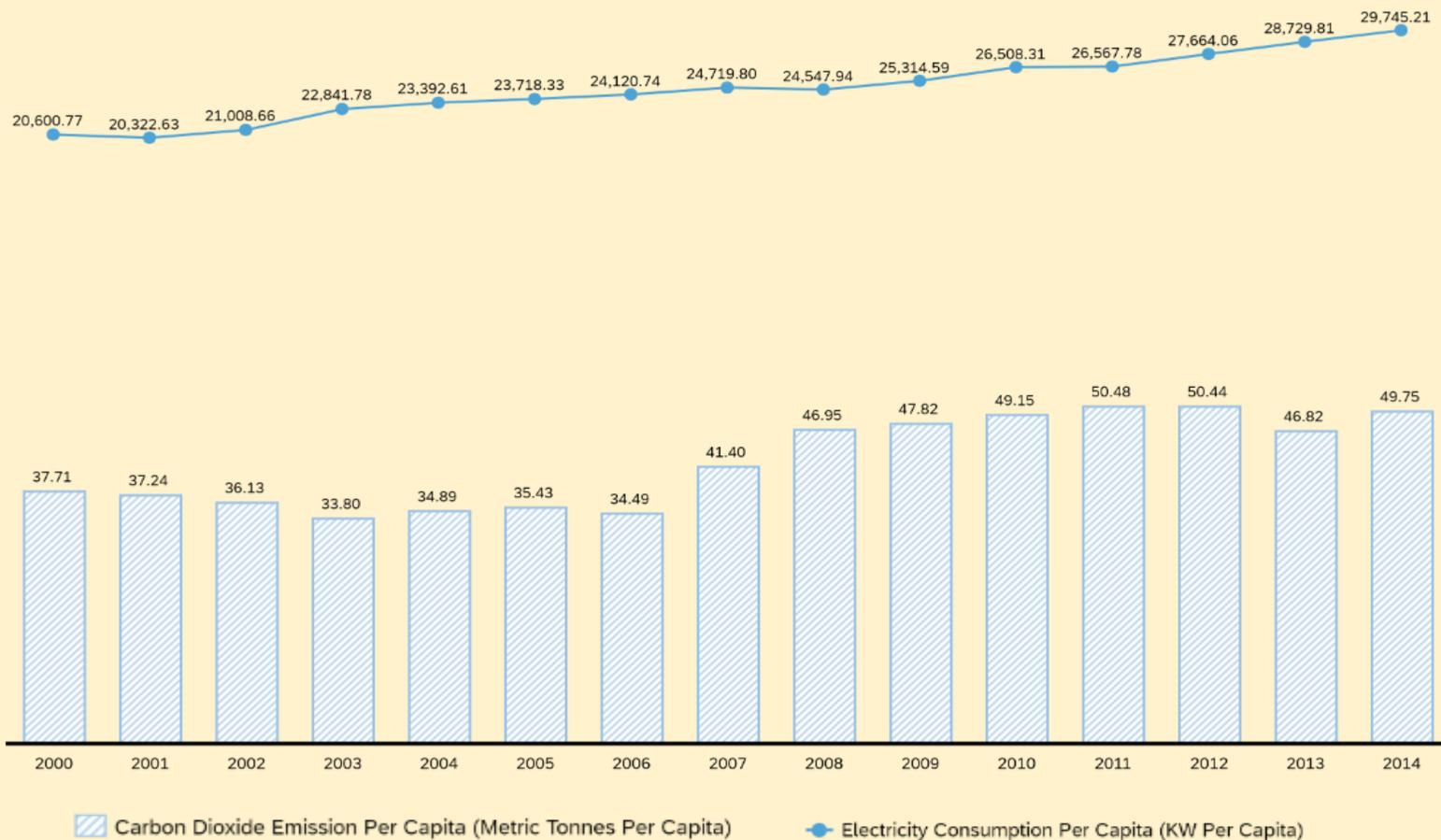
The majority of ASEAN countries are using oil, gas and coal as its main source for generating electricity.

From the graph, we can assume that the more electricity we use, the higher the CO2 emissions will be.

According to **IEA (2019)**, Since 2000, overall energy demand has grown by more than **80%** and oil is the largest element in the regional energy mix and coal.

Source: Our World in Data, IEA.

Non-Renewable will result in CO2 Emissions

As a result **of oil, gas and coal** are being used as a main source to generate electricity.

=

It has made **air pollution** as a major risk to public health and has driven up energy-related carbon dioxide (CO2) emissions.

→
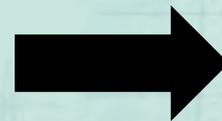
According to WHO (2020), in 2016, an estimated value **of 2.4 million** premature deaths were attributed to air pollution.

Source: WHO.

Are Energy lost during distribution?

Electric Power Transmission and Losses (% of output) per country in 2014

1 Filter

10.06%
6.94%
6.62%
2.20%
25.36%
10.19%
10.18%
22.19%
6.27%

Brunei/2014　Cambodia/2014　Indonesia/2014　Malaysia/2014　Myanmar/2014　Philippines/2014　Singapore/2014　Thailand/2014
Vietnam/2014
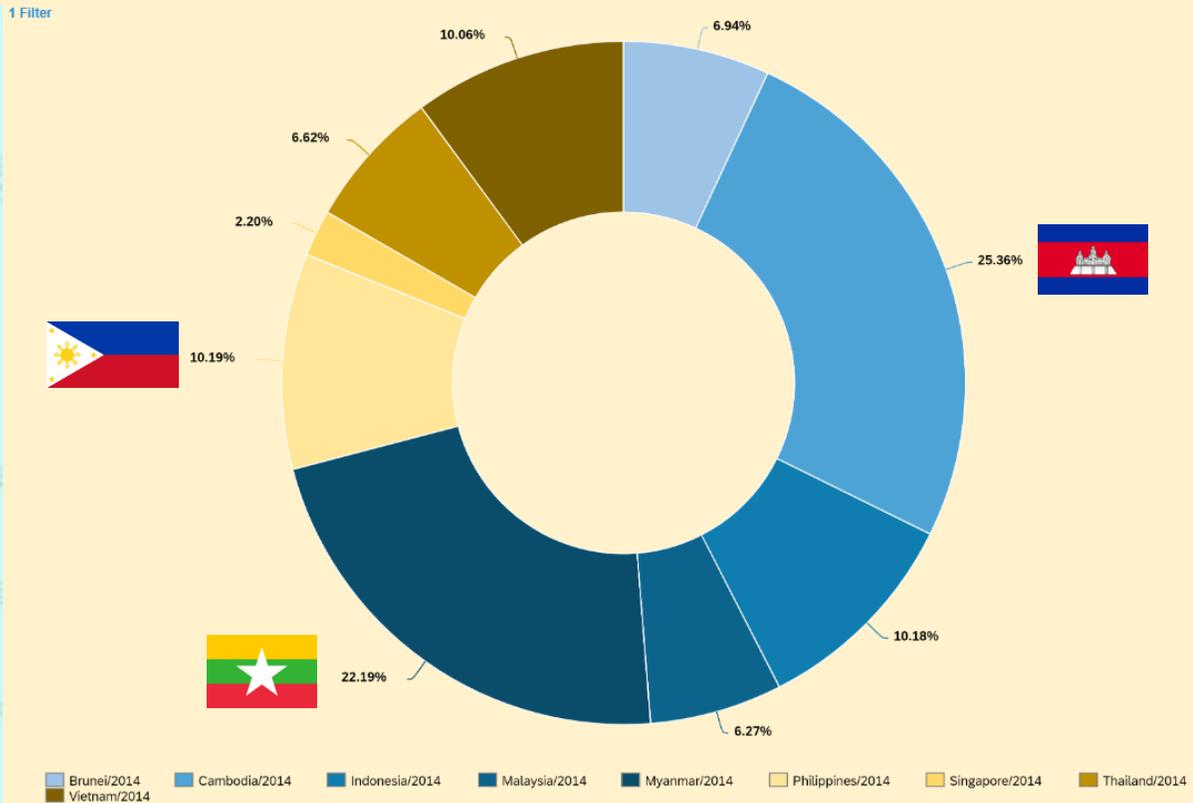
The electricity that we consume is not 100% the electricity that was generated. This is because there are electricity that are loss during transmission and distribution.

Countries that uses more renewable energy has the highest power transmission and distributional losses.

Hence, to mitigate the losses and improve efficiency, more efficient distributions techniques must be implemented.

Therefore, less energy is loss during distribution.

Source: Our World in Data, IEA.

Problems

Solution

Increase of Carbon Dioxide (CO2) emission as a result of using oil, gas and coal sources for generating electricity.

Depletion of scarce resources (i.e oil, gas and coal) that can be used for economic development.

Inefficiency as a result of loss of energy during transmission and distribution of electricity.

ASEAN

Resilient Energy

Initiative

2050

GOAL

To shift away from non-renewable and produce cleaner and sustainable electricity for an urban area.

ASEAN Resilient Energy Initiative 2050

Objectives ?

- Build resilient energy cities
- Reduce Carbon Dioxide Emissions
- Preserve Natural Resources
- Improve Economies
- Discovery of New Technologies
- Educate upcoming Generations

Lower Greenhouse gasses Emission

10 Percent of RE

Able to Contribute to the Paris Agreement in 2016

In line with Brunei's "Vision 2035"

Source: ASEAN Post, UNFCC.

ASEAN Resilient Energy Initiative 2050

Educating The Youths

2021 - 2025 (1) — Preparation
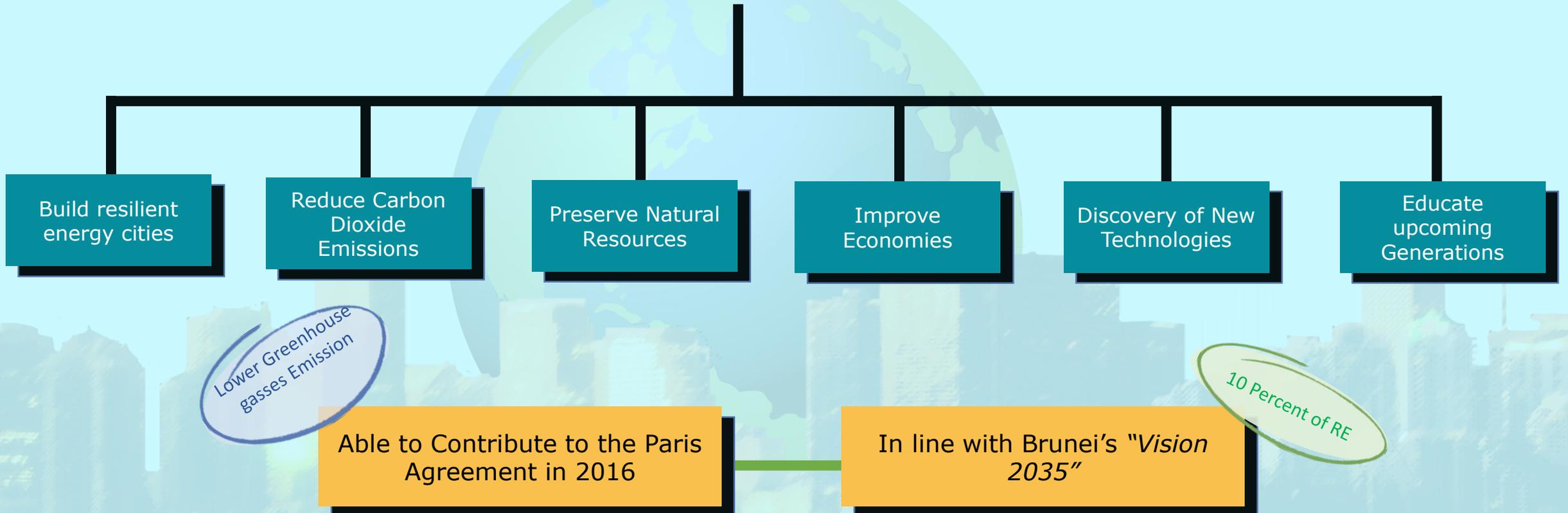
- R&D + Artificial Intelligence + Information sharing with other countries
- Minimize oil, gas and coal consumption for generating electricity by **5%**
- Implement small scale renewable technologies

2026 - 2035 (2) — Implementation

- Utilize info and knowledge gained from Phase 1
- Implement large scale renewable energy sources, smart grids and superconductors to prevent inefficiency and energy loss by heat
- Subsidize solar panels
- "Renewable Energy Farms & Gardens" + Kinetic Step in cities
- Minimize oil, gas and coal consumption for generating electricity by **10% to 25%**
- Decrease CO_2 emission from oil, gas and coal production for electricity

2036 - 2050 (3)

- Produce renewable energy technologies for export
- Improve and update current renewable energy technologies
- **Rapid reduction** in CO_2 Emission from Electricity generated
- **Above 25%** dependency on Renewable Energy

ASEAN Resilient Energy Initiative 2050

Whirlpool Turbine

Smart Flower

Floating Solar Plant

Kinetic Step

Can power dozens of home for 24 hours and generate 5KWH – 500KWH

Uses sun tracking system for higher efficiency
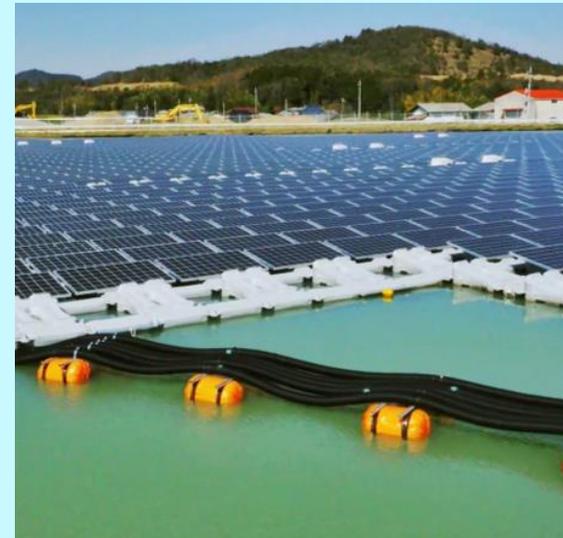
Uses water to cool down panels

Generates 7KW per step

Source: Business Insider

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Appendix 1 – Detailed Plan

Educating The Youths

1 — 2021–2025

- Research & Development for better and cheap technology
- Artificial Intelligence Implementation to predict optimum areas, sources and time of renewable energy
- Learn and share successful implementation between each countries
- Minimize Oil, gas and coal consumption for generating electricity by **5%**

Implementing small scale renewable energy generators in urban areas such as whirlpool turbines in rivers, solar photovoltaic on top of buildings and etc.

2 — 2026–2035

- Use information collected from AI to determine which is the best location for renewable energy sources
- Implement large scale renewable energy sources in Urban buildings and personal houses
- Start on creating "Renewable Energy Farms" in rural areas while "Renewable Energy Gardens" in Urban areas
- Minimize Oil, gas and coal consumption for generating electricity by **10% to 25%**

- Implement smart grids and superconductors to prevent inefficiency and energy loss by heat
- Research & Development for newer sources of Renewable energy, such as "Waste to Electricity"
- Implement "Kinetic Step Energy in walkways to power up lights and nearby accessories
- Decrease Carbon Dioxide emission as a result of Oil, gas and coal consumption from electricity

Subsidize solar panels so more people are able to use it hence decreasing dependency on main electricity source

3 — 2036–2050

- Produce own renewable energy technologies for export
- Improve and update current renewable energy technologies
- **Rapid reduction** in Carbon Dioxide Emission from Electricity generated
- **Above 25%** dependent on Renewable Energy

Appendix 2 – Estimated Cost

Whirlpool Turbine	Solar Panels	Kinetic Steps

Whirlpool Turbine

Depending on the size, it can cost as low as USD$3,000 to USD$65,000

Solar Panels

Cost of large scale of Solar Panels have drastically **decreased** by **74%** between 2010 – 2018

Solar PVs have high initial cost however, the cost for solar generated power in 2019 was recorded below $0.15 and $0.10 per KWH.

Cheaper for long term

Kinetic Steps

USD$75 – USD$160 per square foot to install. An example of implementation in Washington DC costs USD$200,000

Source: EPRI, Forbes, GreenTech Media, IRENA, Investopedia

Appendix 3 – Estimated Cost for a country

Estimate Total Cost for an ASEAN country

Research and Development: USD$30 million

Implementation of large-scale renewable resources

- Smart Grids: USD$20 Billion

- Subsidizing Solar Panels / million household – USD$3 Billion

- Kinetic Steps - $10 million

- Whirlpool Turbines – USD$5 million

Total Cost ~ USD$23.5 Billion

Source: EPRI, Forbes, GreenTech Media, IRENA, Investopedia

Appendix 4 – Example of Sustainable City

Sustainable City, Al Qudra Rd, Dubai

113 Acre

USD$354 million

Source: Business Insider