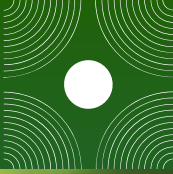
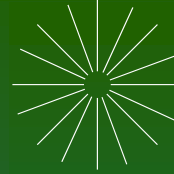




Ministry of Health  
Malaysia



# SUSTAINABLE HEALTHCARE FACILITY: EMPOWERING ENVIRONMENTAL HEALTH PROGRAMME

By: Ir. Ts. Dr. Noor Muhammad Abd. Rahman  
Head of Sector (Sustainability Programme)  
Engineering Services Division, MoH.





# TABLE OF CONTENTS

---

**01**

---

**INTRODUCTION**

---

**02**

---

**WHY ARE WE SO  
DETERMINED?**

---

**03**

---

**PROGRAMMES AND  
INITIATIVES**

---

**04**

---

**ISSUES AND  
CHALLENGES**

---

**05**

---

**POTENTIAL  
SOLUTIONS**

---

**06**

---

**WAY FORWARD**



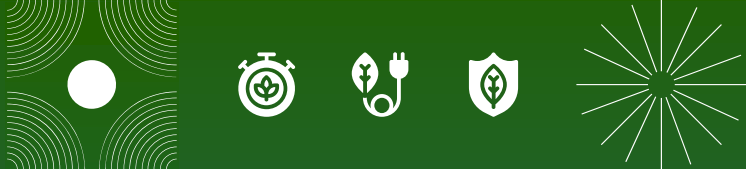
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01

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# INTRODUCTION

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# Climate Change and Environmental Health

Air quality

Water quality and availability

Vector-borne diseases

Direct health impacts

Mental health

Healthcare infrastructure

Food security

Vulnerable populations

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02

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# WHY ARE WE SO DETERMINED?

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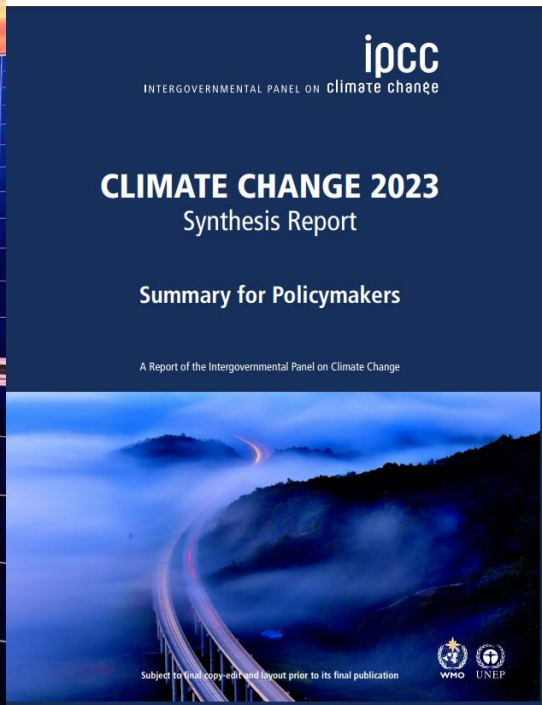


# Why are we so determined?

To keep warming to 1.5°C requires **deep, rapid and sustained** GHG emissions reductions.

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To provide **green, safe and future-proof** healthcare facilities.



ipcc

INTERGOVERNMENTAL PANEL ON climate change

**CLIMATE CHANGE 2023**

Synthesis Report

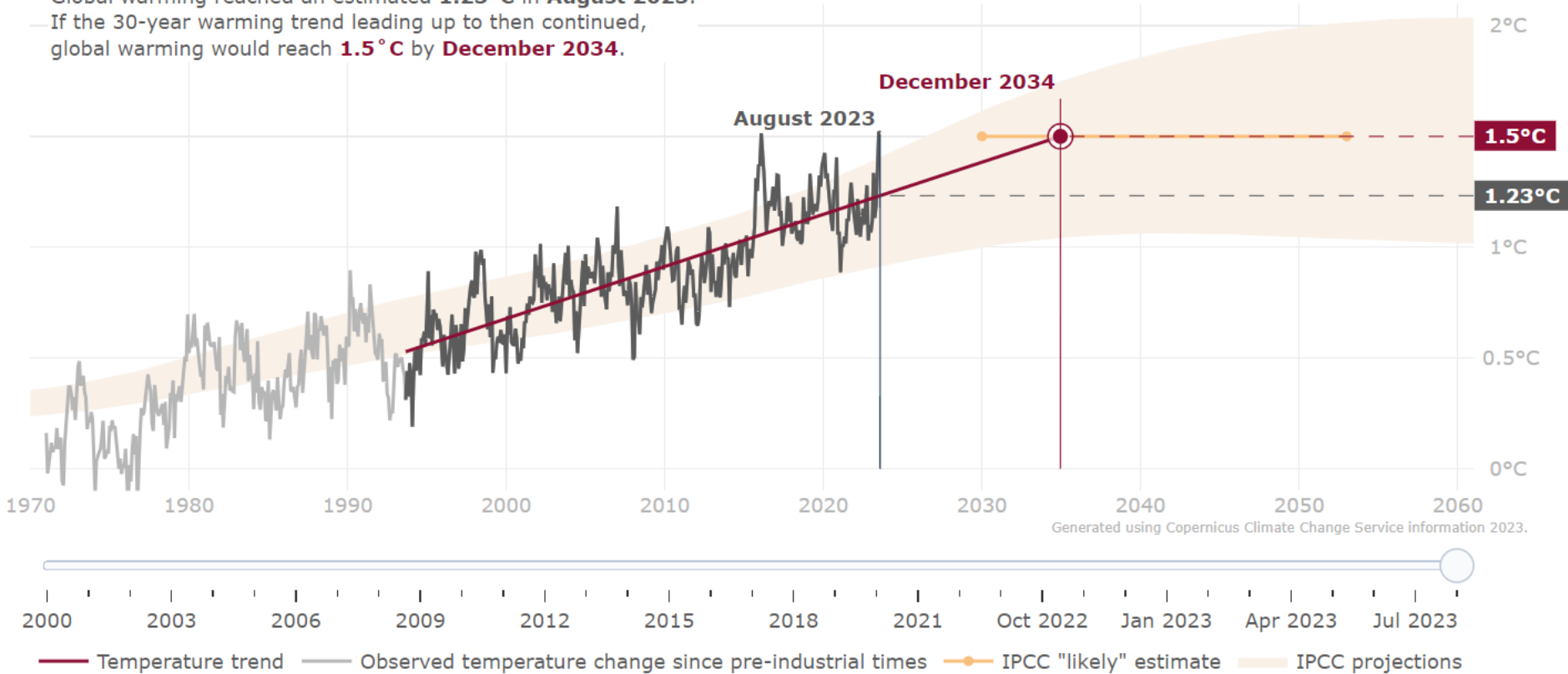
Summary for Policymakers

A Report of the Intergovernmental Panel on Climate Change

Subject to final copy-edit and layout prior to its final publication



Global warming reached an estimated **1.23°C** in **August 2023**.  
If the 30-year warming trend leading up to then continued,  
global warming would reach **1.5°C** by **December 2034**.

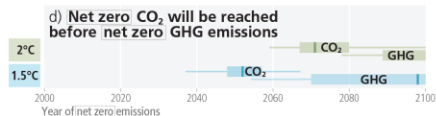
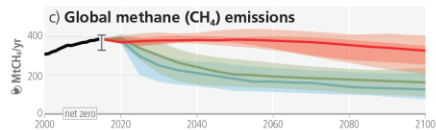
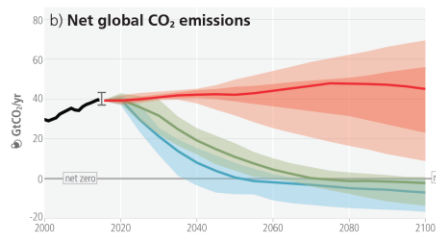
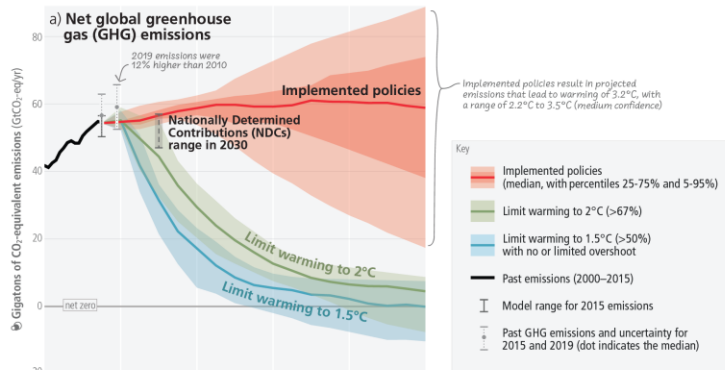


June, July and August were individually the hottest of those months ever recorded, with July the hottest month on record globally.

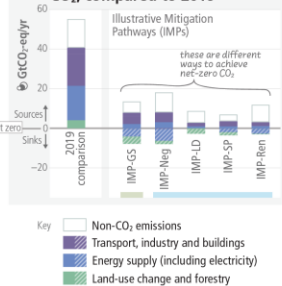
Source: <https://climate.copernicus.eu/>

## Limiting warming to 1.5°C and 2°C involves rapid, deep and in most cases immediate greenhouse gas emission reductions

Net zero CO<sub>2</sub> and net zero GHG emissions can be achieved through strong reductions across all sectors



## e) Greenhouse gas emissions by sector at the time of net zero CO<sub>2</sub>, compared to 2019



## Climate change drags countries into water stress

The Middle East, North Africa (83% exposed), and South Asia (74% exposed) face the highest water stress

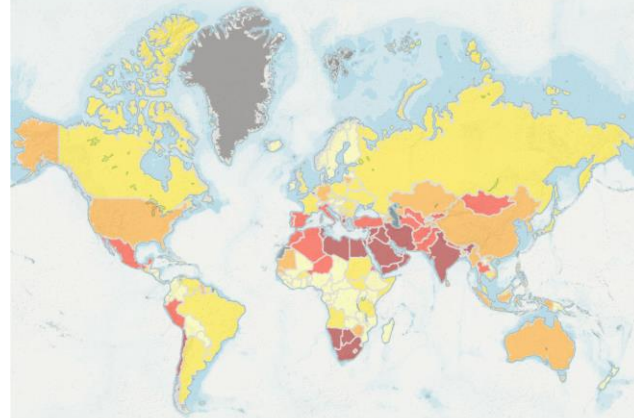


Around 4 billion people live under highly water-stressed conditions for at least one month of the year

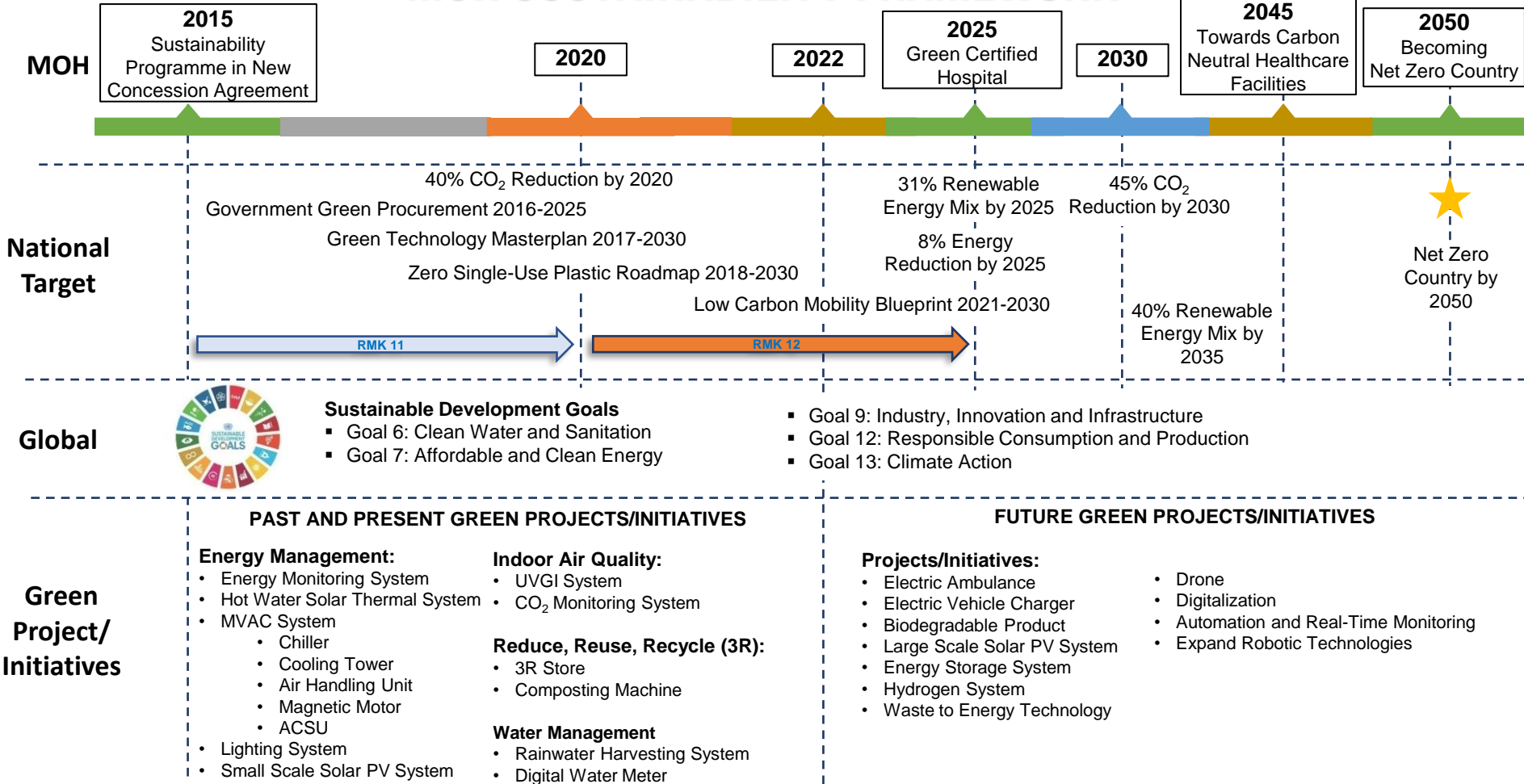
### WATER STRESS BY COUNTRY



### MOST WATER-STRESSED COUNTRIES



# MOH SUSTAINABILITY FRAMEWORK



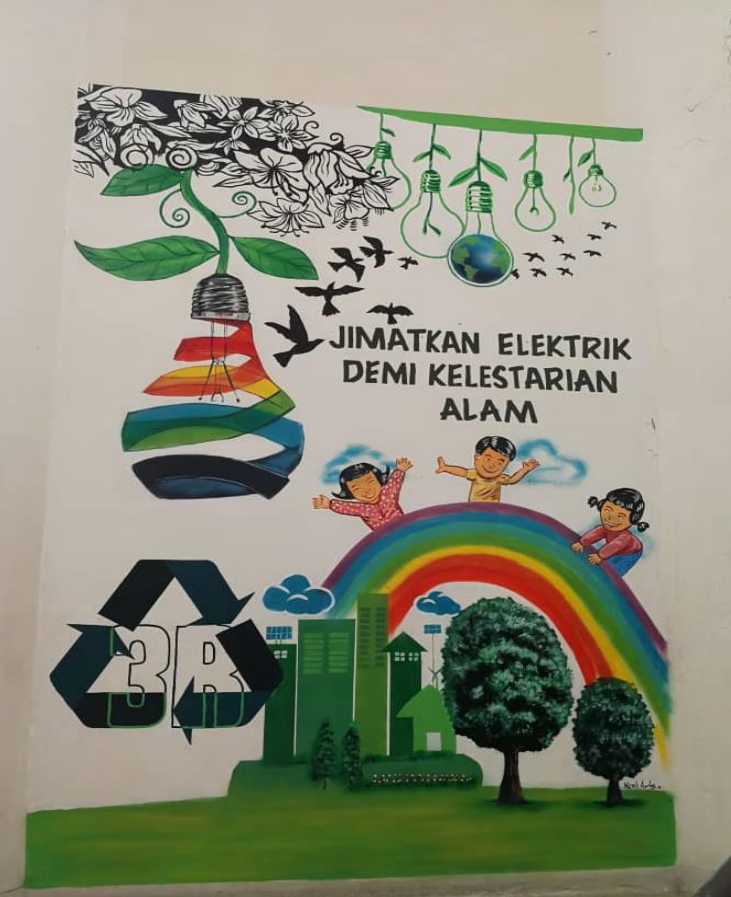
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03

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# PROGRAMMES & INITIATIVES

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# LED Retrofit





**Chiller retrofit**



# Solar photovoltaic



# Solar Thermal



# Awareness Programme



ACHIEVE



**LEED**  
PLATINUM – 3 Hospitals  
GOLD - 5 Hospitals



**ENERGY  
MANAGEMENT GOLD  
STANDARD**  
3 Star - 79 Hospitals  
2 Star - 44 Hospitals  
1 Star - 25 Hospitals



**MyCREST**  
6 Hospital



**ASEAN ENERGY  
AWARDS**  
5 Hospitals



**SEDA PASS**  
36 Hospitals



**NATIONAL ENERGY  
AWARDS**  
14 Hospitals

## ACHIEVEMENTS

# ACHIEVEMENTS



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**696 GWh**  
Total Electric Saved

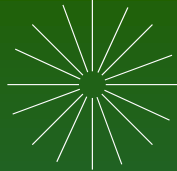
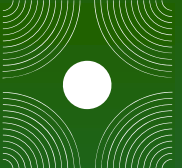


**RM 292 millions**  
Total Saving



**487,000 Tonne**  
Total Carbon Reduction

Saving up to 2022 with baseline from 2015/2016



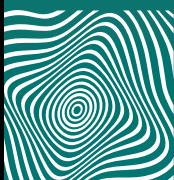
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04

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**ISSUES &  
CHALLENGES**



Insufficient  
funding

Technology is  
expensive

Skills and  
competencies

Ageing assets

Implementation method  
for government buildings

Reluctance to adopt  
novel changes

Attitude and  
behavior

**Sustainable  
healthcare facilities**





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05

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**POTENTIAL  
SOLUTIONS**





# Potential solutions



● Green technology

● Capacity building

● Collaborative effort

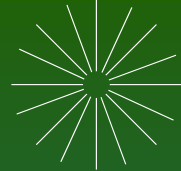
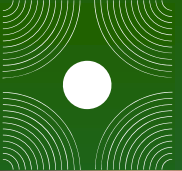
● Innovative model

● Sustainable financing

● Strategic partnership

● Sustainability advocate

● Shared responsibility



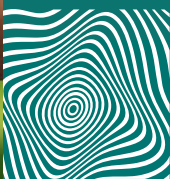
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06

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**WAY FORWARD**





# CARBON NEUTRAL HEALTHCARE FACILITIES



MINISTRY OF HEALTH  
MALAYSIA

MOH/S/BPKJ/02.23(HB)

  
MINISTRY OF HEALTH  
MALAYSIA



**CARBON NEUTRAL HEALTHCARE FACILITIES BLUEPRINT**

Towards A Future-Proof Healthcare Facility

Towards A Future-Proof Healthcare Facility


**CARBON NEUTRAL HEALTHCARE FACILITIES BLUEPRINT**

**KEY CONSIDERATION FOR GETTING STARTED**

**4 Focus Areas**

**12 Strategies**

**47 Action Plans**



**4 FOCUS AREAS AND 12 STRATEGIES**

**Focus Area 1: GHG emission reduction and low carbon building**

- S1 : Strengthening and expanding the Sustainability Programmes
- S2 : Expand the application of green technology and environmentally friendly products
- S3 : Encouraging the adoption of low carbon mobility

**Focus Area 2: Safe and comfort environment**

- S4 : Improving indoor environmental quality
- S5 : Creating a safe and healthy built environment

**Focus Area 3: Green and smart building**

- S6 : Promoting green practices to the building occupants/users
- S7 : Practicing sustainable facility management
- S8 : Adopting new technology and smart systems
- S9 : Continuous monitoring and reporting through certification and management systems

**Focus Area 4: Carbon neutral facility**

- S10 : Shifting to renewable energy sources
- S11 : Designing sustainable sites and landscapes
- S12 : Preserving & conserving ecosystems and biodiversity

19

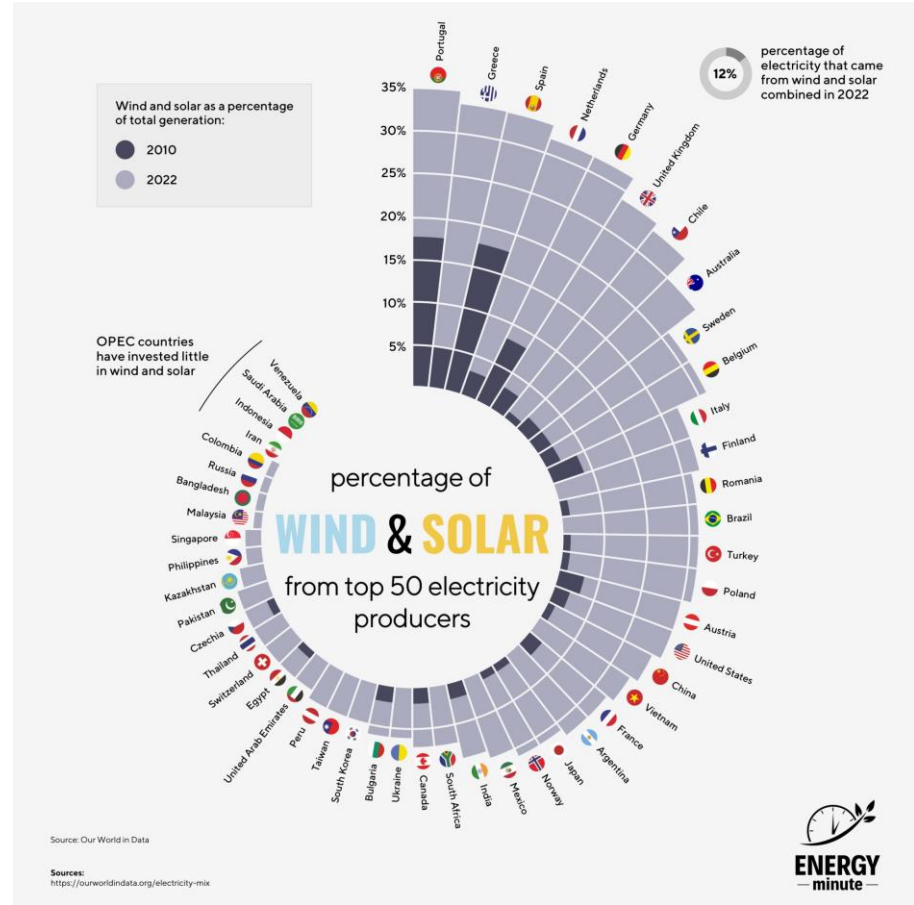
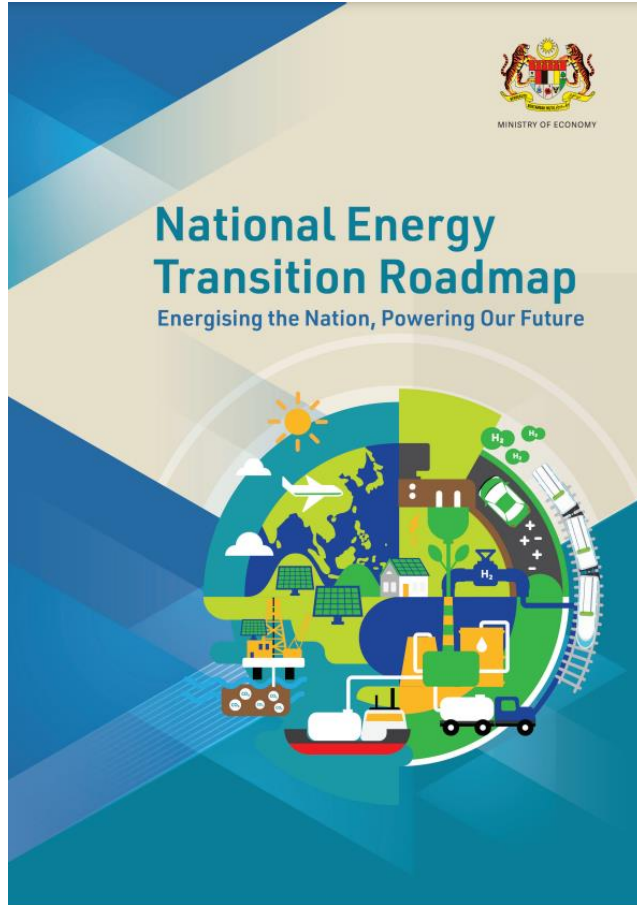




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MALAYSIA



# Decarbonization of energy systems



# Embracing the circular economy



## Minerals Required for Green Energy Technologies

IISD International Institute for Sustainable Development

SOLAR TECHNOLOGY				WIND TECHNOLOGY			ELECTRIC VEHICLES & ENERGY STORAGE			
<b>Al</b> Bauxite & Aluminum	<b>Ge</b> Germanium	<b>Ni</b> Nickel	<b>Te</b> Tellurium	<b>Al</b> Bauxite & Aluminum	<b>Fe</b> Iron	<b>Mo</b> Molybdenum	<b>Al</b> Bauxite & Aluminum	<b>C</b> Graphite	<b>Li</b> Lithium	<b>* Rare Earths</b>
<b>Cd</b> Cadmium	<b>In</b> Indium	<b>Se</b> Selenium	<b>Sn</b> Tin	<b>Cr</b> Chromium	<b>Pb</b> Lead	<b>* Rare Earths</b>	<b>Co</b> Cobalt	<b>Fe</b> Iron	<b>Mn</b> Manganese	<b>Si</b> Silicon
<b>Cu</b> Copper	<b>Fe</b> Iron	<b>Si</b> Silicon	<b>Zn</b> Zinc	<b>Co</b> Cobalt	<b>Mn</b> Manganese	<b>Zn</b> Zinc	<b>Cu</b> Copper	<b>Pb</b> Lead	<b>Ni</b> Nickel	<b>Ti</b> Titanium
<b>Ga</b> Gallium	<b>Pb</b> Lead	<b>Ag</b> Silver		<b>Cu</b> Copper						

\* The "Rare Earths" designation refers to 17 different elements, including dysprosium and neodymium (critical for wind technologies and energy storage), as well as praseodymium (critical for electric vehicles and energy storage).

Sources: Data primarily from the World Bank (2017), Levin Sources (2017), USGS (2017), Bloomberg New Energy Finance (2018), and the American Exploration & Mining Association (2013).

# Restoration of ecosystems



UN environment programme

COUNTRIES MUST DOUBLE

**INVESTMENTS  
IN NATURE-BASED  
SOLUTIONS**

TO TACKLE THE CLIMATE CRISIS,  
BIODIVERSITY LOSS AND LAND  
DEGRADATION

A small image of a green plant with several leaves is located in the bottom right corner of the slide. The plant is shown against a dark blue background. The leaves are bright green and have a slightly waxy texture. The stem is thin and brown.

# THANK YOU

Surely, we have a responsibility to leave for future generations a planet that is healthy and habitable by all species..

