



ENGINEERS
AUSTRALIA

Lenka Kollar

Co-Founder,
Helixos



UN Sustainable Development Goals and the Role of Nuclear Technology

Lenka Kollar
Co-founder, Helixos



An aerial photograph of a lush green terraced tea plantation. The tea bushes are arranged in neat, curved rows that follow the contours of the hills. Several small, rounded trees are scattered throughout the terraces. In the lower right corner, a small, simple wooden hut with a thatched roof is visible, nestled among the tea plants. The overall scene is vibrant and shows a well-maintained agricultural landscape.

Sustainable development
means meeting the needs of the present
without compromising the ability
of future generations to meet their own needs.

- United Nations General Assembly, 1987-



Millennium Development Goals

2000-2015

SUSTAINABLE DEVELOPMENT GOALS



SUSTAINABLE DEVELOPMENT GOALS



- **End poverty** in all its forms everywhere
- Equal rights to economic resources and access to **basic services**



- Ensure **healthy lives** and promote well-being for all people at all ages
- Improve mortality rate of **babies and children** under 5 years of age



- **End hunger**, achieve food security, improve nutrition, and promote **sustainable agriculture**
- Address nutritional needs of pregnant and lactating **women**



- Ensure inclusive and equitable **quality education** and promote lifelong learning opportunities
- Deliver technical and **vocational training** for skills for decent employment

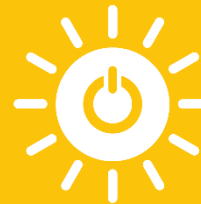
SUSTAINABLE DEVELOPMENT GOALS

5 GENDER EQUALITY



- Achieve gender equality and **empower all women** and girls
- Ensure women's full and effective **participation in leadership** at all levels of decision-making in political, economic, and public life

7 AFFORDABLE AND CLEAN ENERGY



- Ensure access to affordable, reliable, sustainable, and modern **energy for all**
- Enhance **international cooperation** on clean energy research and technology

6 CLEAN WATER AND SANITATION



- Ensure availability and sustainable management of **water and sanitation**
- Improve water quality by **reducing pollution**

8 DECENT WORK AND ECONOMIC GROWTH



- Promote sustained, inclusive, and sustainable **economic growth**, including full and productive employment

SUSTAINABLE DEVELOPMENT GOALS

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



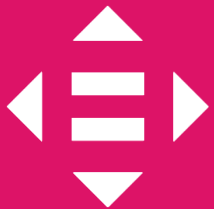
- Build resilient infrastructure, promote inclusive and sustainable industrialisation and **foster innovation**
- Improve **resource-use efficiency** and adoption of clean technologies

11 SUSTAINABLE CITIES AND COMMUNITIES



- Make **cities** and human settlements inclusive, safe, resilient, and **sustainable**
- Ensure access to safe and **affordable housing**

10 REDUCED INEQUALITIES



- **Reduce inequality** within and among countries
- Eliminate discriminatory laws, policies, and practices

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



- Ensure **sustainable consumption** and production patterns
- **Reduce waste** through prevention, reduction, recycling, and reuse

SUSTAINABLE DEVELOPMENT GOALS



- Take urgent action to combat **climate change** and its impacts
- Strengthen **resilience** and adaptive capacity to climate-related hazards and natural disasters



- Protect, restore, and promote sustainable use of **ecosystems**
- Sustainably manage forests, combat desertification, and halt and reverse land degradation and **biodiversity** loss



- Conserve and **sustainably use** the oceans, seas, and marine resources
- **Conserve** coastal areas



- Promote peaceful and inclusive **societies**
- Provide access to **justice for all**

SUSTAINABLE DEVELOPMENT GOALS



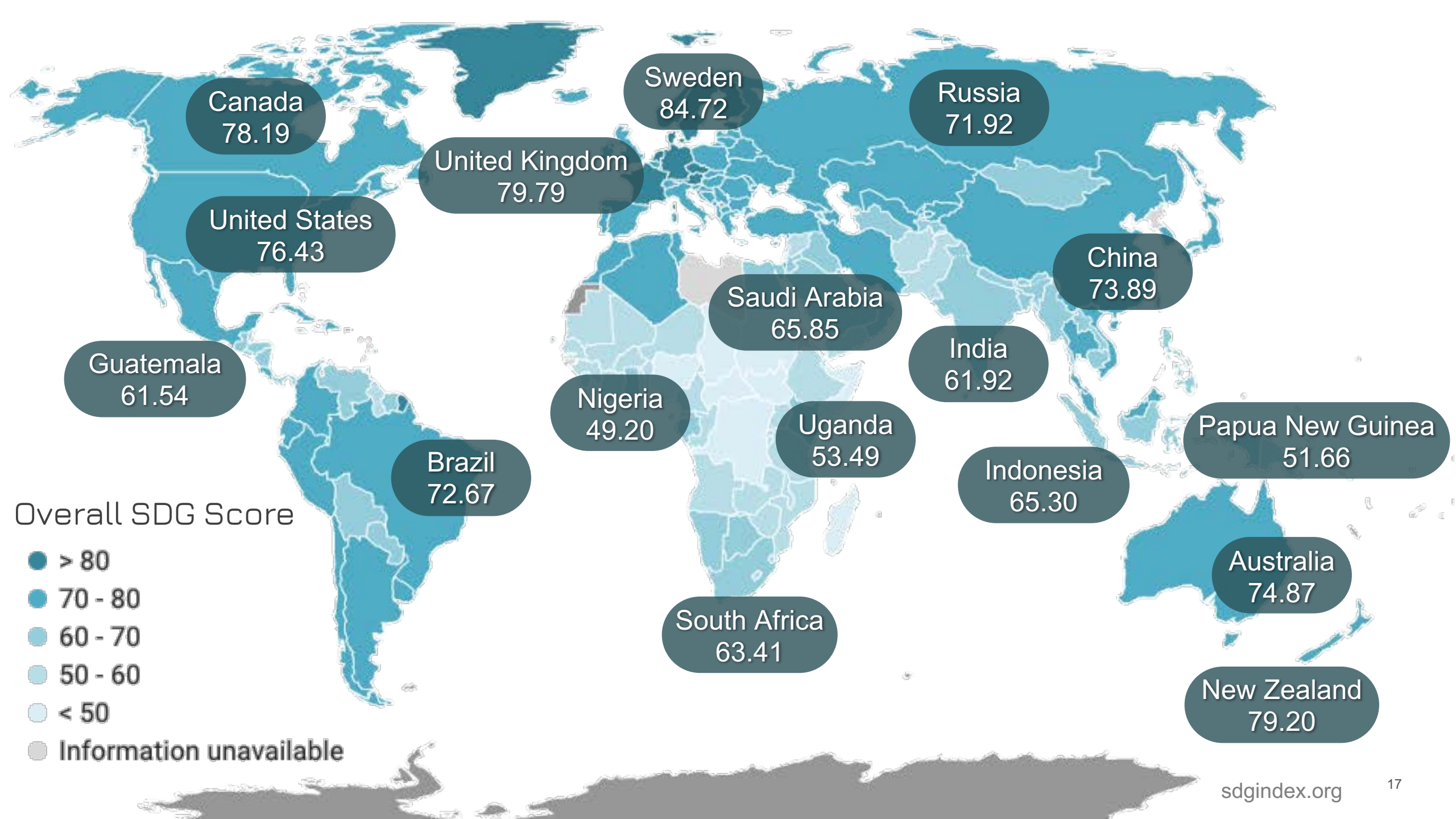
Which three SDGs stand out to you the most?



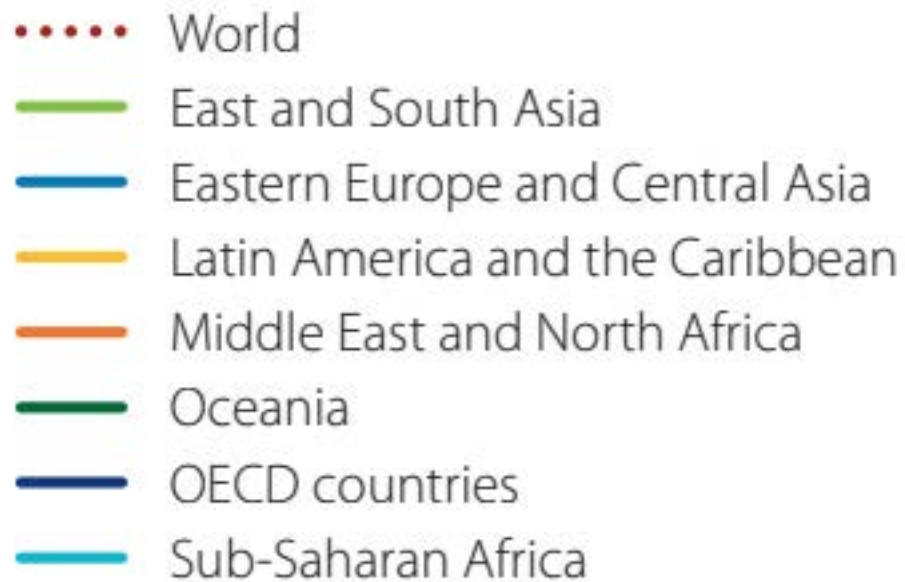


Progress on the Goals

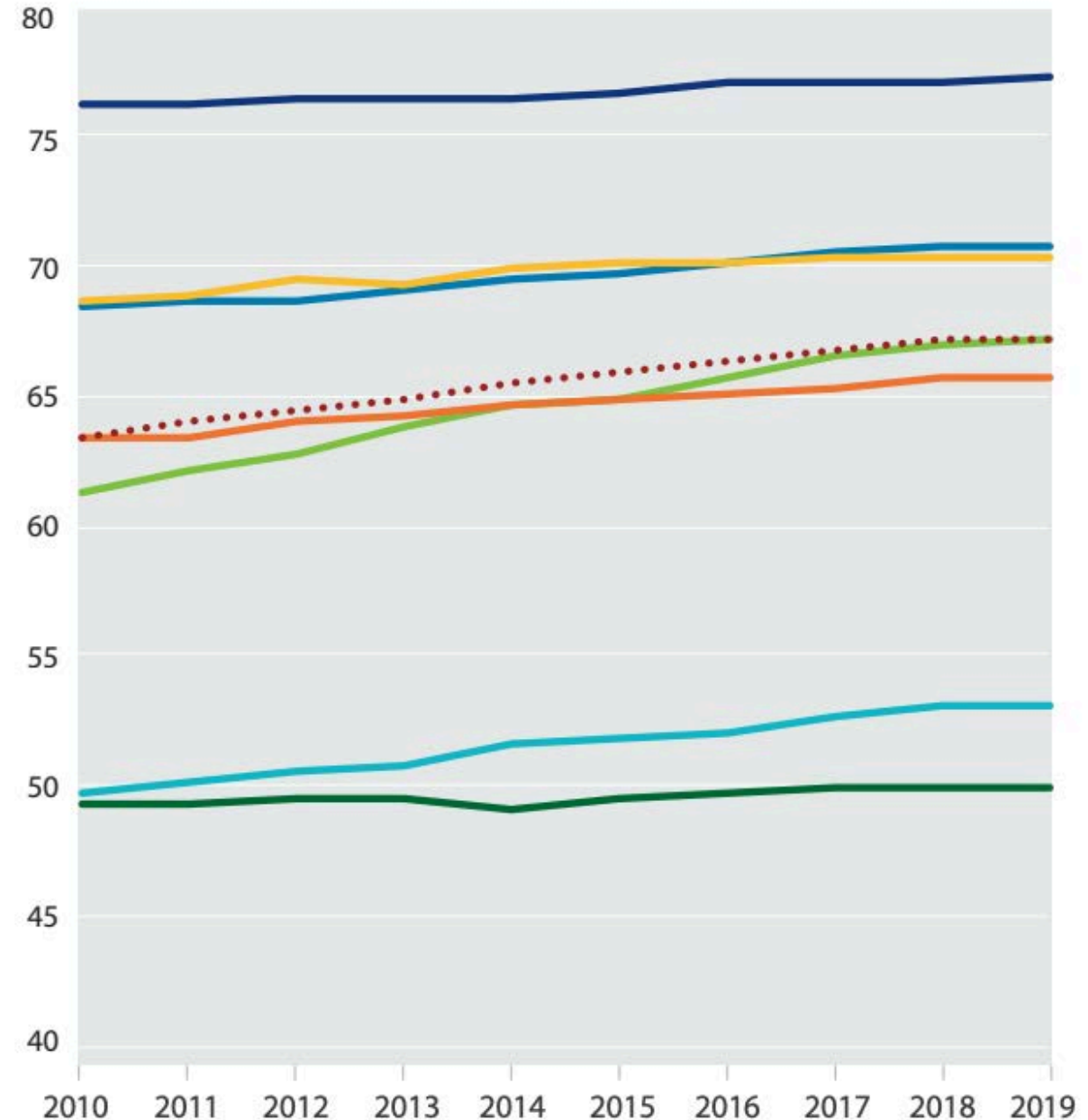
- Overall, the world has been **making progress** towards the SDGs.
- On average, progress has been **faster in low- and middle-income countries** compared with high-income countries.
- Countries in **East and South Asia** have made the most progress towards the SDGs since the adoption of the goals in 2015.
- The world is facing the worst **public health and economic crisis** in a century, which will have severe negative impacts on most SDGs.
- COVID-19 has also **exacerbated inequalities** by disproportionately affecting the most vulnerable.
- This crisis calls for **increased international collaboration** and solidarity to support the most vulnerable countries.



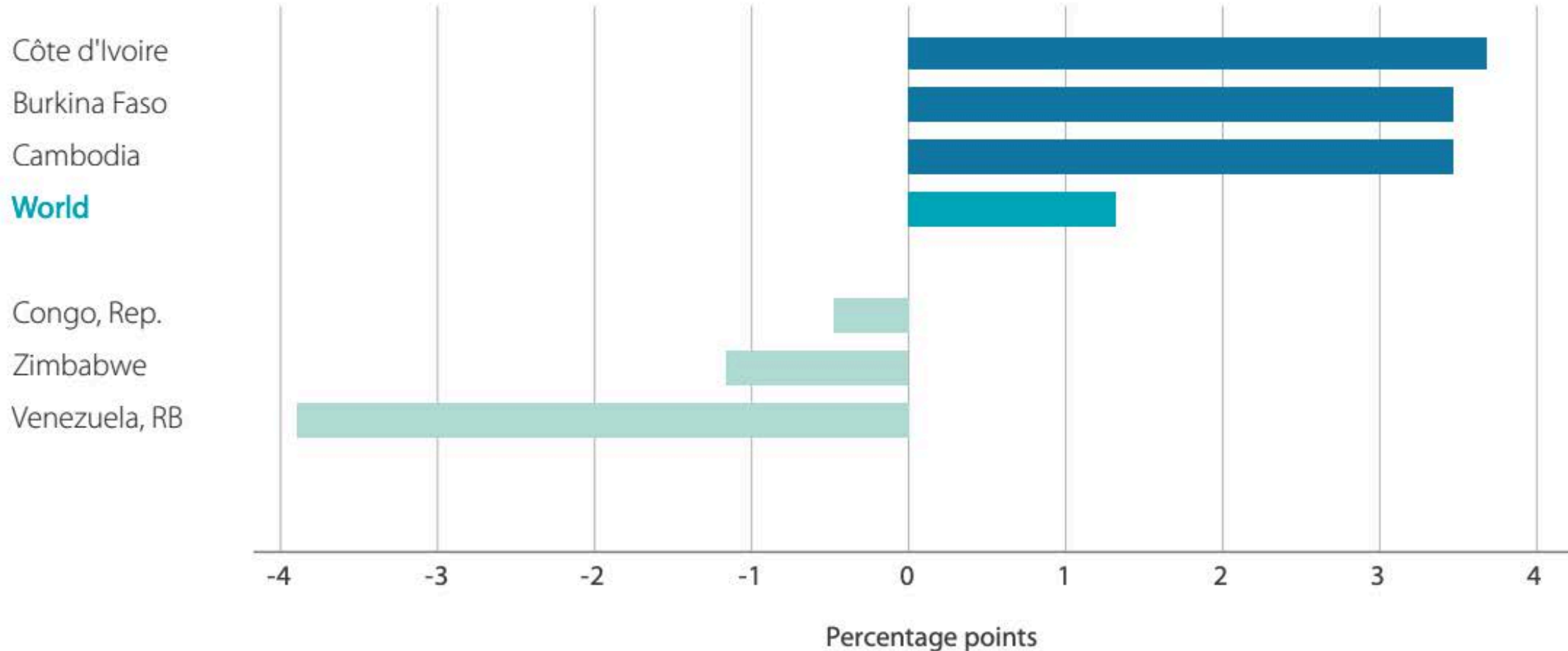
Progress on the SDG Index by region



SDG Index score



Countries whose SDG Index score has improved or decreased the most since 2015



COVID-19 Implications



**COVID-19 CAUSES
THE FIRST INCREASE**
IN GLOBAL POVERTY IN DECADES

AFFORDABLE AND RELIABLE ENERGY
IS CRITICAL FOR HEALTH FACILITIES



1 IN 4 NOT ELECTRIFIED
IN SOME DEVELOPING COUNTRIES (2018)

**LOCKDOWNS ARE INCREASING THE RISK OF
VIOLENCE AGAINST WOMEN AND GIRLS**



PHYSICAL



SEXUAL



PSYCHOLOGICAL



**3 BILLION
PEOPLE WORLDWIDE**

LACK BASIC HANDWASHING
FACILITIES AT HOME



THE MOST EFFECTIVE METHOD FOR
COVID-19 PREVENTION

Not all has been lost



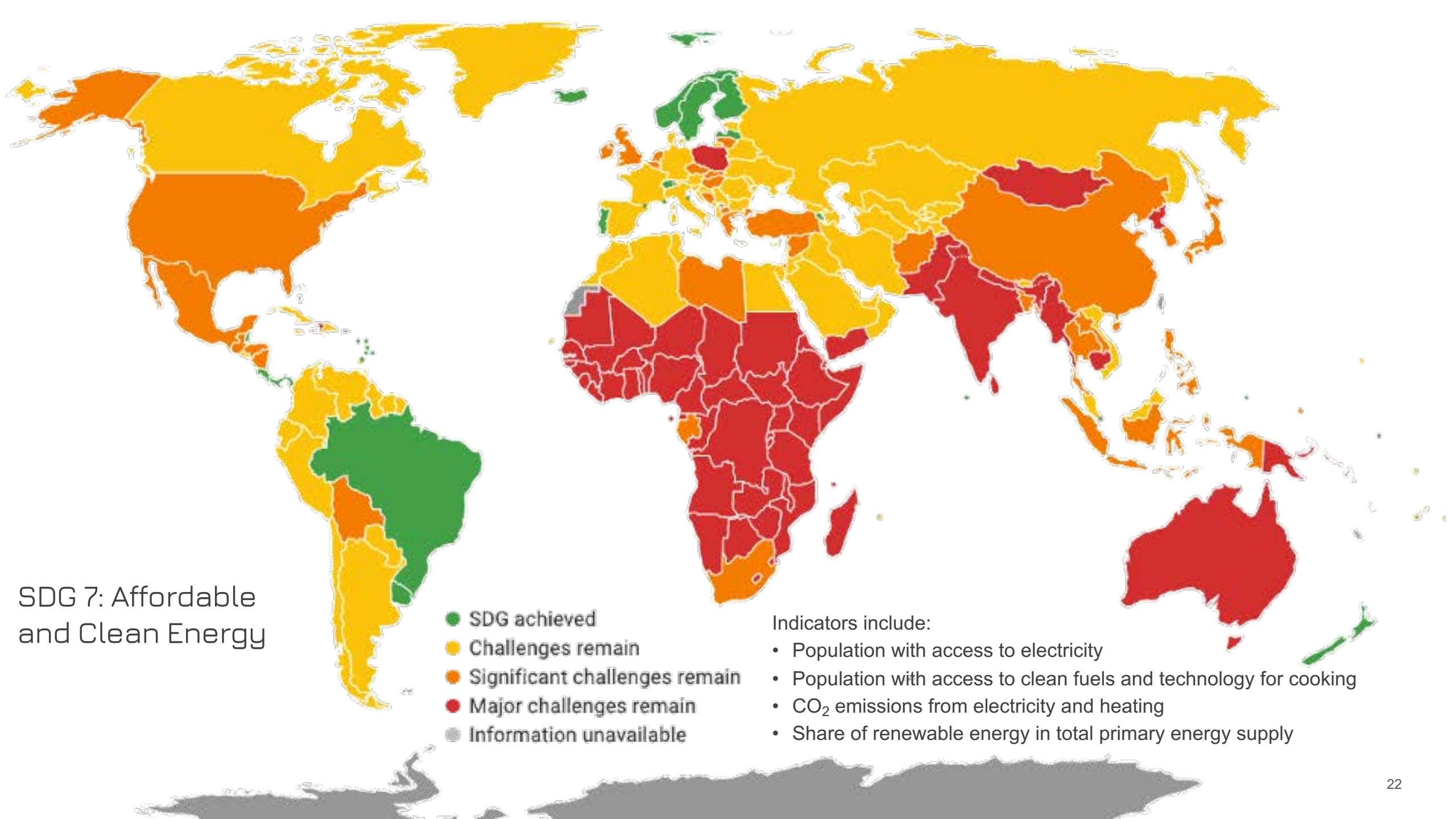
COVID-19 MAY RESULT IN A
**6% DROP IN GREENHOUSE
GAS EMISSIONS** FOR 2020

STILL SHORT OF **7.6% ANNUAL
REDUCTION** REQUIRED TO LIMIT
GLOBAL WARMING **TO 1.5°C**

THE DRASTIC REDUCTION IN HUMAN ACTIVITY
—— BROUGHT ABOUT BY COVID-19 ——
MAY BE A CHANCE FOR OCEANS TO RECUPERATE



THE PANDEMIC OFFERS AN OPPORTUNITY TO
DEVELOP RECOVERY PLANS
THAT BUILD A MORE SUSTAINABLE FUTURE





Country Profile: Australia

+ OVERALL
SCORE

74.9

+ OVERALL
RANK

37



How many SDGs has Australia achieved?



Legend: ● SDG achieved ● Challenges remain ● Significant challenges remain ● Major challenges remain



Country Profile: Australia

- ↑ **Poverty rate** – only 0.63% live on less than \$4/day
- ↗ **Poverty rate after taxes** – 12% fall below half the median disposable income after taxes
- ↑ **Universal health coverage** – check!
- ↑ **Life expectancy** – 83 years at birth
- ↓ **Prevalence of obesity** – included in Zero Hunger, 29% have a BMI greater than 30
- ↗ **Seats held by women in parliament** – only 30%, goal is 50%
- ● **Women in science and engineering** – only 27% graduating with STEM degrees are women
- → **Energy-related CO₂ emissions** – everyone has access to electricity, but high in emissions
- → **Share of renewable energy** – only 7% of primary energy supply is renewable



Country Profile: Australia

- → **Satisfaction with public transit** – only 56%
- ↑ **Protected marine sites important to biodiversity**
- ↑ **Protected land important to biodiversity**
- ↓ **Fish caught from overexploited stocks** – high at 74%
- ↑ **Corruption Perception Index**
- ↑ **Press Freedom Index**
- ↓ **Persons held in prison** – 168 people per 100,000 people are in prison, goal is 25 per 100,000, and they are disproportionately represented: Aboriginal and Torres Strait Islander adults make up ~2% of the population, but 27% of the national prison population
- ↓ **International development assistance as a share of gross national income** – currently 0.23%, goal is for OECD countries to provide 1% of gross national income to assist developing countries



What surprises you
about Australia's
progress on the SDGs?

Where would you like to
see Australia do better?

How does nuclear
science & technology
contribute to the SDGs?





International Atomic Energy Agency (IAEA)

- The IAEA is a United Nations organisation with the mandate: **Atoms for Peace and Development**.
- Many countries use **nuclear science and technology** to contribute to and meet the SDGs in areas including energy, human health, industry, water management, and environmental protection.
- Use of these techniques contributes directly to **eight SDGs**.

Nuclear Contribution to the SDGs



- Irradiation to protect **food quality**, increase shelf life, and ensure food safety
- Isotopic techniques to study **malnutrition** and obesity



- **Isotopic techniques** to study the quality and quantity of water resources, including pollutants



- Nuclear imaging to **diagnose** cancer and cardiovascular diseases
- **Radiation therapy** to treat cancer



- **Nuclear energy** to provide low-carbon, affordable, and reliable energy

Nuclear Contribution to the SDGs



- Radiation for **sterilising** products and tools
- **Radiotracers** to diagnose and improve industrial processes
- **Non-destructive testing** with X-rays, gamma rays, or neutrons



- **Isotopic techniques** to study how ocean acidification and pollutants have an affect on marine ecosystems



- Isotopic techniques to monitor how **climate change** affects the environment
- **Mutation breeding** through gamma irradiation and X-rays to create crops adaptable to climate change



- Use **isotopes**, such as nitrogen-15 and carbon-13, to assess soil quality and study how crops take up nutrients

Nuclear Innovation and Sustainable Development

- Nuclear energy can serve as a catalyst for **clean growth** and economic development
- New nuclear power reactors are designed to **work with renewables**, enabling a quicker transition to clean energy
- Low-carbon and reliable energy and **heat for industrial processes**, such as cement production, aluminium smelting, and water desalination
- Production of **clean fuels**, like hydrogen
- Nuclear research reactors for the production of **medical isotopes** also serve as a base for education, research, and innovation



Image courtesy of Third Way

What did you learn about
nuclear technology and
sustainable development?



How can
individuals,
organisations,
& businesses
contribute to
the SDGs?



Individual Contribution

- **Educate** yourself and others
- **Donate** and fundraise
- **Volunteer** in-person and online
- Practice **sustainable habits** in your own life
- Encourage your **employer** and **professional organisations**
- Tell your **policymakers** that you want more action on sustainable development – at home and abroad



The Business Case for the SDGs

- Better society is **better for business** – business cannot succeed in societies that fail
- Sustainable use of resources leads to **corporate sustainability**
- New partners, customers, investors, and other stakeholders for a **shared purpose**
- Help **define the ‘why’** behind the company, improve employee satisfaction and productivity
- In turn, attract **more diverse employees and customers**



Business & Organisational Contribution

- **Benchmark** existing operations with SDGs
- **Set goals** and track indicators
- Make operations and products **more sustainable**, beware of **greenwashing**
- Encourage **employees** to adopt sustainable habits at work and at home
- **Partner** with other companies and organisations on sustainable development
- Advocate for **policymakers** to take more action on sustainable development





The SDG agenda is not perfect

- Delicate balance between more and less
- Traditional model of economic growth exacerbates resources and does not eliminate inequality
- Does not address underlying institutional issues and power structures that perpetuate inequality
- It takes a lot of effort just to collect and measure all of this data
- Qualitative outcomes cannot measure the true happiness and satisfaction of people

A Caution Against Saviourism

- Saviour complex: helping people in a **self-serving** manner.
- Your **intentions** may be good, but are you actually helping?
- **Listen!** You are probably not the expert in what others need.
- Be sure to volunteer and contribute to development work that you are actually **qualified** to do.
- Recognise that the **path to development** may look completely different in other countries, or even for others within your own country.





How are you already contributing to the SDGs?

Does this match the 3 SDGs that you wrote down in the beginning?

What steps will you take next?

References

- United Nations SDGs: sdgs.un.org/goals
- Sustainable Development Report Dashboard: dashboards.sdgindex.org
- The Sustainable Development Report 2020: sdgindex.org/reports/sustainable-development-report-2020
- International Atomic Energy Agency (IAEA): iaea.org/about/overview/sustainable-development-goals
- Third Way: thirdway.org/blog/nuclear-reimagined



Resources

- SDG Zone: sdgzone.com
- UN Volunteering (for individuals): unv.org/become-volunteer
- SDG Compass (for businesses): sdgcompass.org
- B-Corp Impact Assessment and SDG Action Manager: bcorporation.net/welcome-sdg-action-manager
- No White Saviors: nowhitesaviors.org
- Gapminder: gapminder.org
- Sustainable Development Solutions Network (SDSN): unsdsn.org
- SDSN Youth: sdsnyouth.org
- Engineers Without Borders Australia: ewb.org.au
- The Guardian news feed on SDGs: theguardian.com/global-development/sustainable-development-goals



Engineers Australia: Implementing Sustainability

- Signed declaration to advance the UN SDGs at the 2019 World Engineers Convention
- Developed guide on Implementing Sustainability for engineers – available on the EA website and free for EA members:

www.eabooks.com.au/epages/eabooks.sf/en_AU/?ObjectPath=/Shops/eabooks/Products/SUSTAINABILITY/SubProducts/SUS01





About Helixos

- Collective of people continuing to make the world a better place for everyone
- Track our work and projects with the SDGs
- Services include project management, technical advisory, business strategy, stakeholder engagement, science communication, and more
- Help organisations and businesses achieve sustainable practices, including on energy and waste
- Clients include technology developers and operators, national laboratories, professional organisations, and think tanks

helixos.co
[@helixosco](#)

lenka@helixos.co
[@lenkakollar](#)

“Nature is our biggest ally, and our greatest inspiration...
If we take care of nature, nature will take care of us.”
- David Attenborough -





ENGINEERS
AUSTRALIA

CPD  online

Thank you

Lenka Kollar

lenka@helixos.co