Leveraging IP Rights in the Interest of a Greener Future

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- Awareness – recognition of the need to preserve the environment is growing around the world
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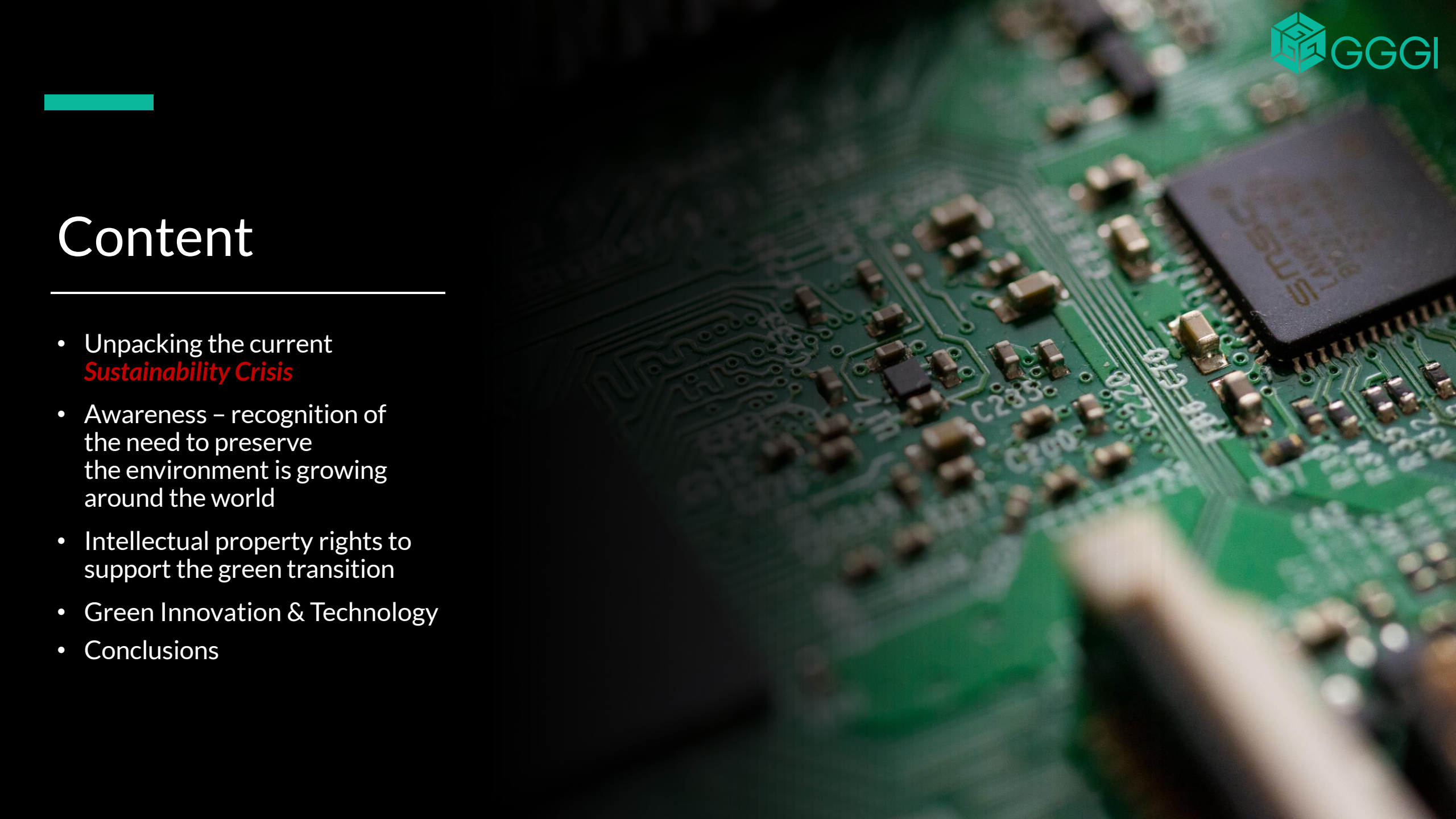


Unpacking the sustainability crisis:

- Climate Change
- Mass species extinction crisis
- Deforestation
- Plastic ocean – dead zones
- Chronic diseases
- Air pollution
- *Infectious disease: COVID-19*

Climate Change:
heat waves, fires, floods, droughts intensify

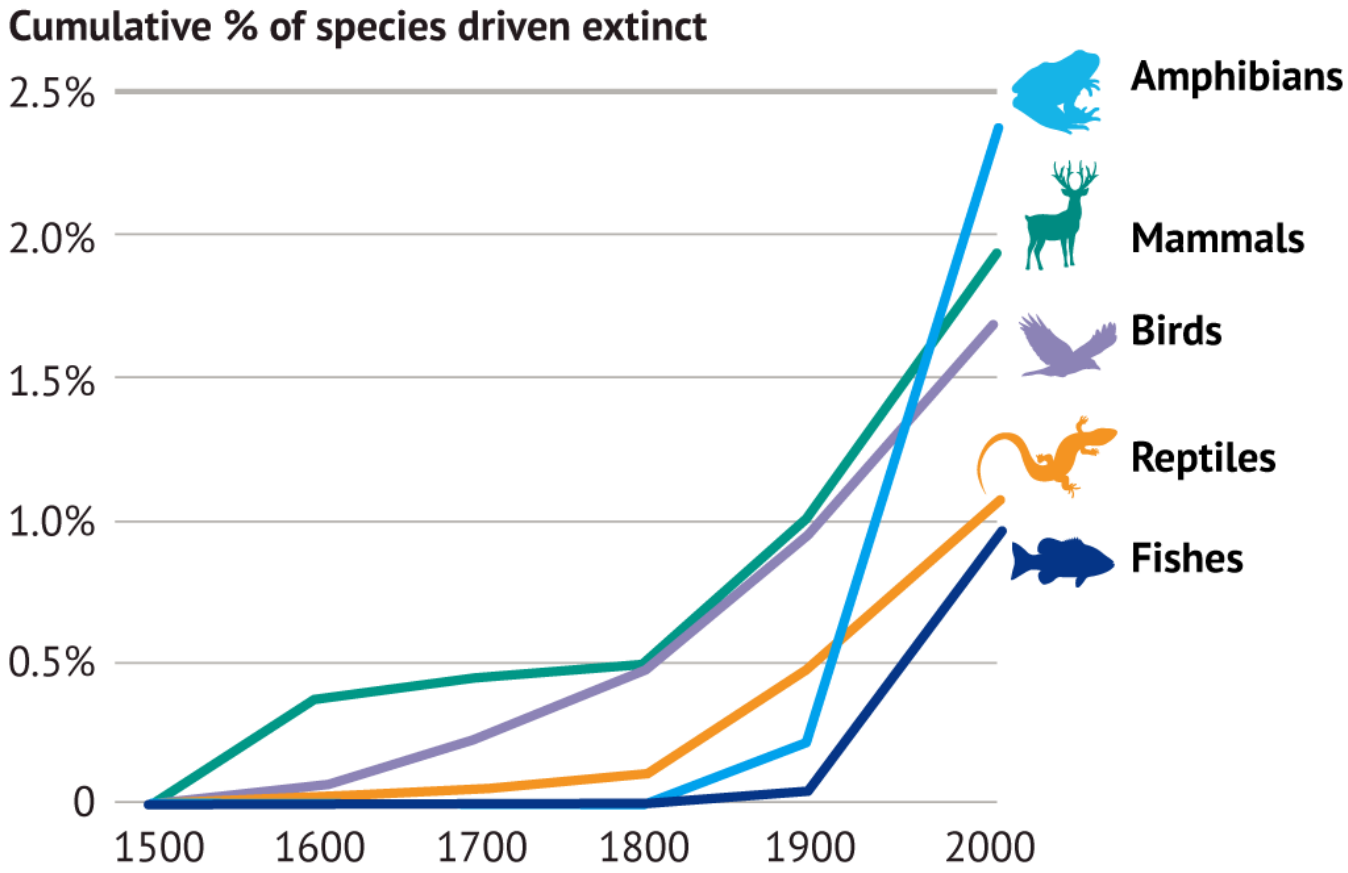
2018: Floods in Kerala worst in a hundred years

2018: Republic of Korea sets all-time record high temperature amid deadly heat wave

2018: Massive forest fires and intense droughts affecting millions of people

The Holocene or 6th mass species extinction

- Estimates range between 24 (MEA) and 150 (CBD) species lost every day.
- Extinction Rebellion protests climate change and linked fear of mass species extinction



Source: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

Global deforestation is rising

- Global tree cover loss has grown from 13 million hectares per year at the turn of the century, to nearly 28 million hectares per year today.
- “What really concerns those of us working on the role of forests in climate change is that global tree cover loss is increasing,” said Christopher Martius, managing director of CIFOR’s office in Bonn, Germany.

Fires burning on the South American continent 27 August 2019, Photo: NASA/FIRMS

Plastic pollution in the oceans

- Only 9% of all plastic waste ever produced has been recycled. About 12% has been incinerated, while the rest — 79% — has accumulated in landfills, dumps or the natural environment.
- **10 rivers** alone carry more than **90% of the plastic waste** that ends up in the oceans

Great Pacific Garbage Patch

Source: UN Environment

The Air Pollution Crisis

- Every year, an estimated 7 million people die from illnesses attributable to air pollution.
- Blue skies are the top priority throughout Asia, from Mongolia to China to Bangkok – but blue skies will also help address the climate crisis.
- Combating climate change and meeting the goals of the Paris Agreement could save around a million lives a year worldwide by 2050 solely through reductions in air pollution.

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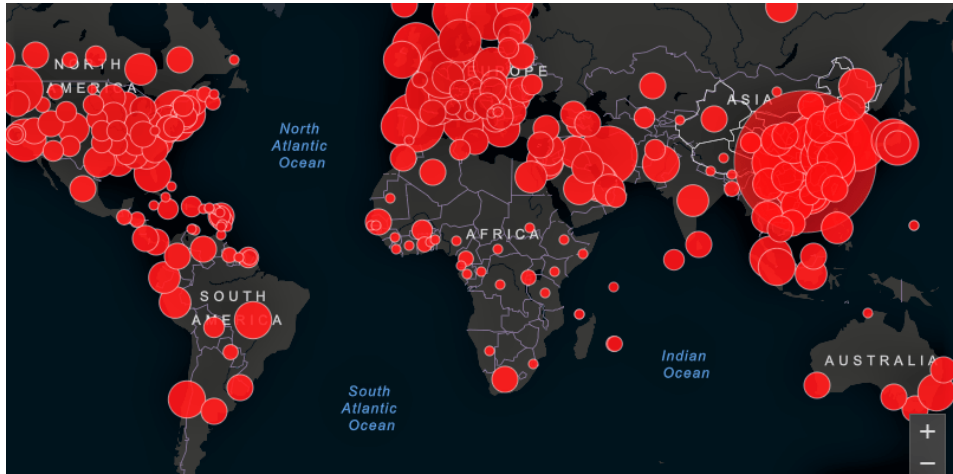
The COVID19-Crisis - what has changed?

- Covid-19 has changed our lives more rapidly than anyone could imagine.
- For many it is a sign that our old life was not sustainable.
- Air pollution and obesity are aggravating factors for COVID-19
- Can we green the COVID recovery?
- How will the economic crisis affect green growth?
- Can we go back to our old lives?
- Can there be a Green New Deal?

COVID and Economic Crisis

- Massive job losses everywhere
- Travel and tourism down 80-90%
- Korean export down 46%
- US low-wage unemployment as high as 40%
- Stimulus bills massively boost government debt and are unsustainable
- End of globalization?



WILDLIFE ROAM STREETS EMPTIED BY CORONAVIRUS

COVID-19 & Vaccination

- Now, more than ever, we need technology advances and innovation to solve the COVID-19 crisis
- Technical innovation has an essential role in the development and deployment of vaccines and other medical goods
- Effective & accessible Intellectual Property systems necessary to facilitate the release of COVID-19 medical products

International Awareness of the Climate Crisis

- Awareness of the urgency to save the environment is spreading across the globe
- Both the public and private sectors are becoming involved to handle the climate crisis
- Governments are increasingly recognizing the importance of carbon neutrality and are starting to set carbon neutrality 2050 goals

Government Commitment

- Strong government commitment is essential to solving the climate emergency.
- Danish Prime Minister Mette Frederiksen pledged to work to achieve Denmark's ambitious 70% cut in CO2 emissions by 2030.
- Sweden, the UK, France, Denmark, and New Zealand have set **legally binding** net-zero 2050 emissions targets
- Copenhagen set a 2025 target to become the first CO2-neutral capital city
- **Green New Deal?**

Source: World Resources Institute

Climate Change: the defining threat of our time

Glasgow COP26 in 2020: the moment of truth for the Paris Agreement as countries submit their new Nationally Determined Contributions – they need to be more solid and more ambitious

Public awareness

Global School Climate Strike

Doctors protesting in support of Extinction Rebellion in London to highlight deaths caused by air pollution. Photograph: Dominic Lipinski/PA

Private Sector Involvement:

- Innovation in green technologies and air quality solutions.
- Carbon pricing: Existing market schemes should be both strengthened and extended to include more economic sectors.
- Encourage asset managers, asset owners, banks, and insurers to decarbonize the economy and account for the true risks posed by climate change
- New business and investment opportunities with the transition to a low-carbon economy.
- UN Global Compact reports that 1,300 companies worldwide have already incorporated a carbon price into their operations.

How do Intellectual Property Rights help solve this sustainability crisis?

IP Rights & Sustainability

- Intellectual property (IP) rights are needed to encourage green technology development and innovation by ensuring that innovators receive credit for their work
- Green technology and innovation are critical elements for the transition to a low-carbon economy
- National IP systems are needed to support sustainable technology
- Strong innovation policy framework can support the achievement of the Sustainable Development Goals

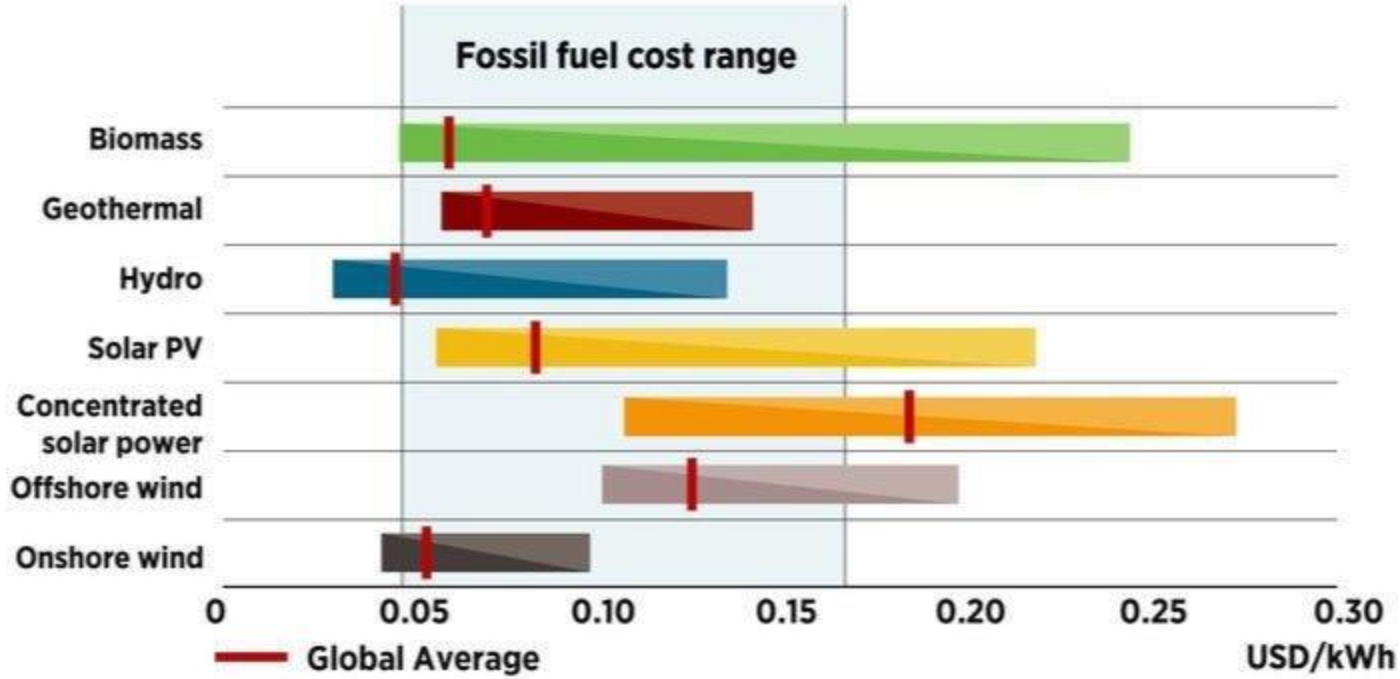
Green Technology Solutions: Overview

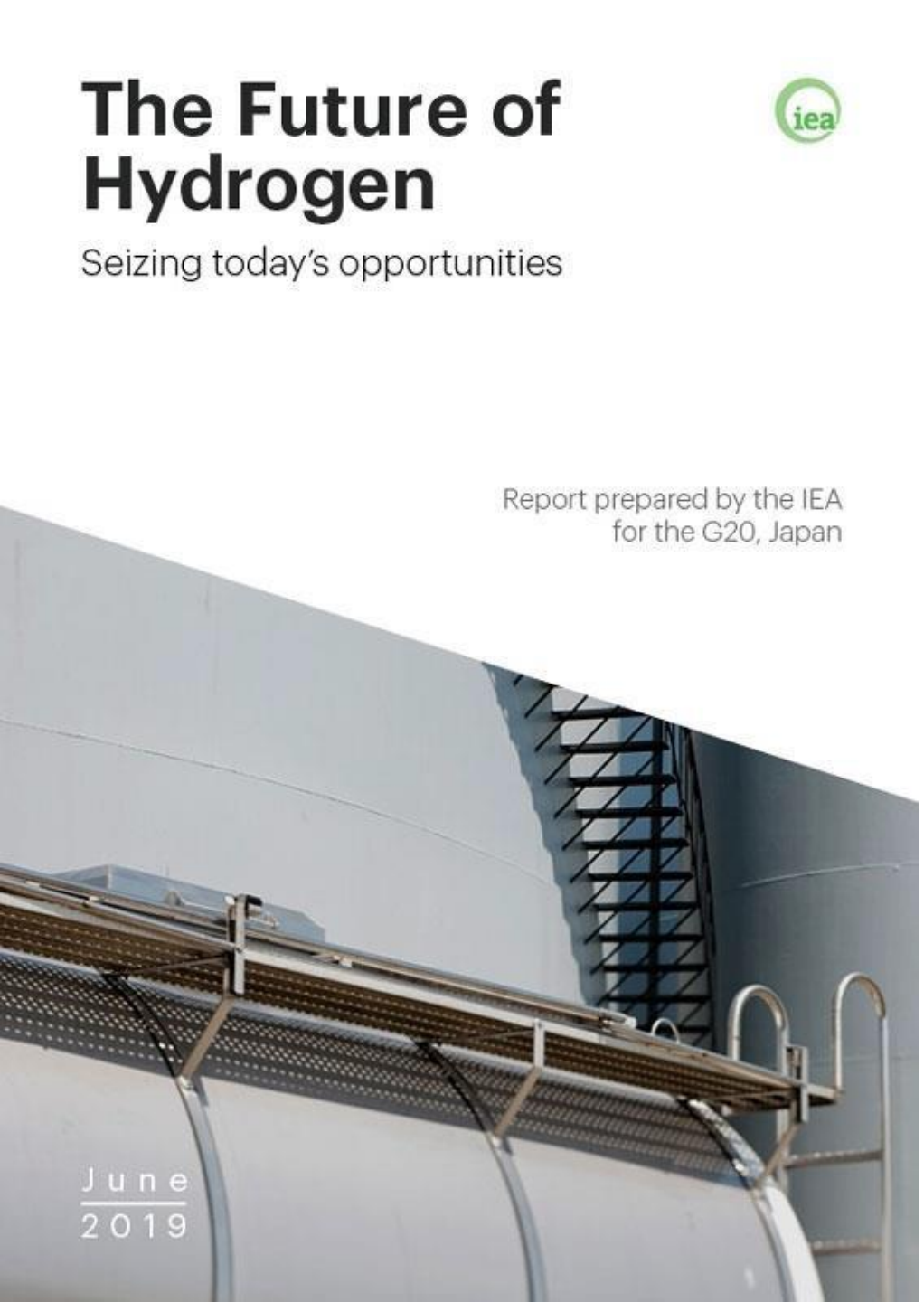
- Lower Costs of Renewable energy
- Energy Storage
- E-Mobility
- Smart Cooking Technology
- Energy efficiency: buildings

Technology Solutions: Renewable Energy

- Investment opportunity in renewable energy.
- Renewable energy is disrupting the energy market.
- Wind and solar energy, in many regions, are now cheaper than fossil fuels.
- Costs of renewable energy technologies, generally, continuing to fall.

Today, the cost of electricity from renewables is cheaper or within the range of fossil fuels





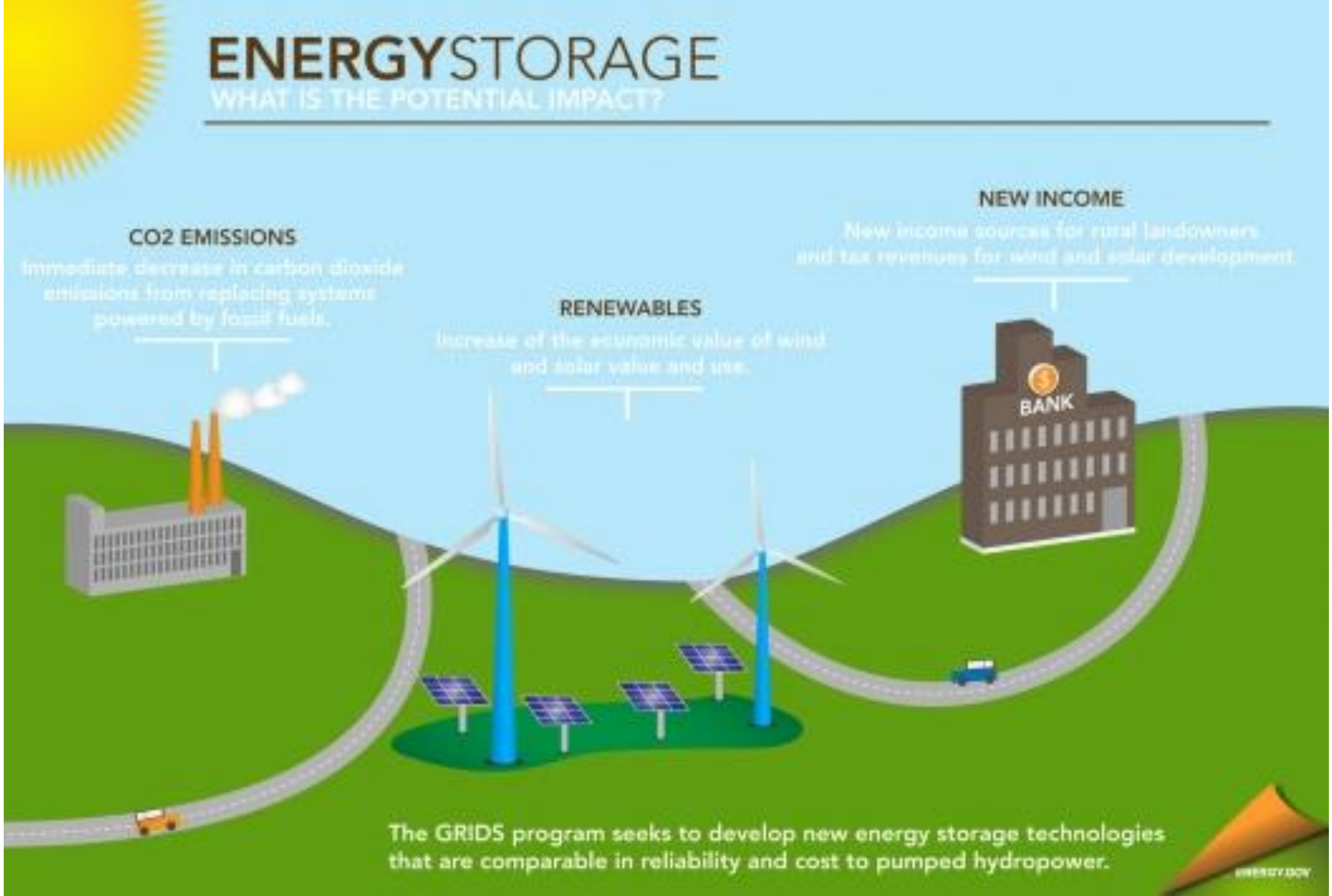
"Hydrogen is today enjoying unprecedented momentum. The world should not miss this unique chance to make hydrogen an **important part of our clean and secure energy future**."
Fatih Birol, Executive Director, IEA

- Dedicated electricity generation from renewables or nuclear power offers an alternative to the use of grid electricity for hydrogen production.
- With declining costs for renewable electricity, in particular from solar PV and wind, interest is growing in electrolytic hydrogen

Falling costs of energy storage

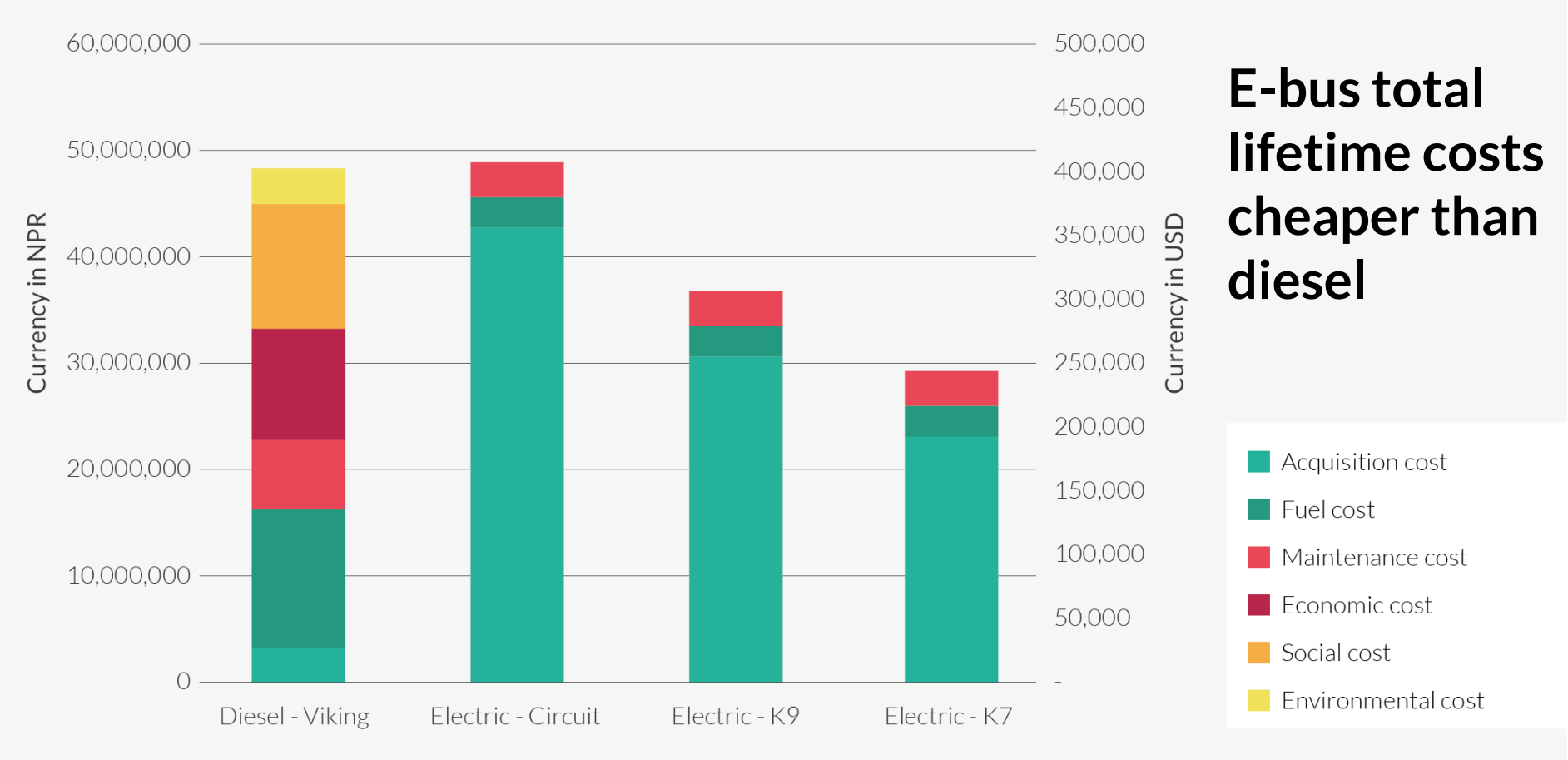
- Storage prices are falling quicker than originally anticipated , partially due to the increasing demand for electric vehicles (EVs).
- With lower prices, storage will be able to play an increasingly larger role in energy markets, such as replacing conventional power generators for reliability, providing power-quality services, and supporting renewables integration.

Source: McKinsey & Company



Source: energy.gov

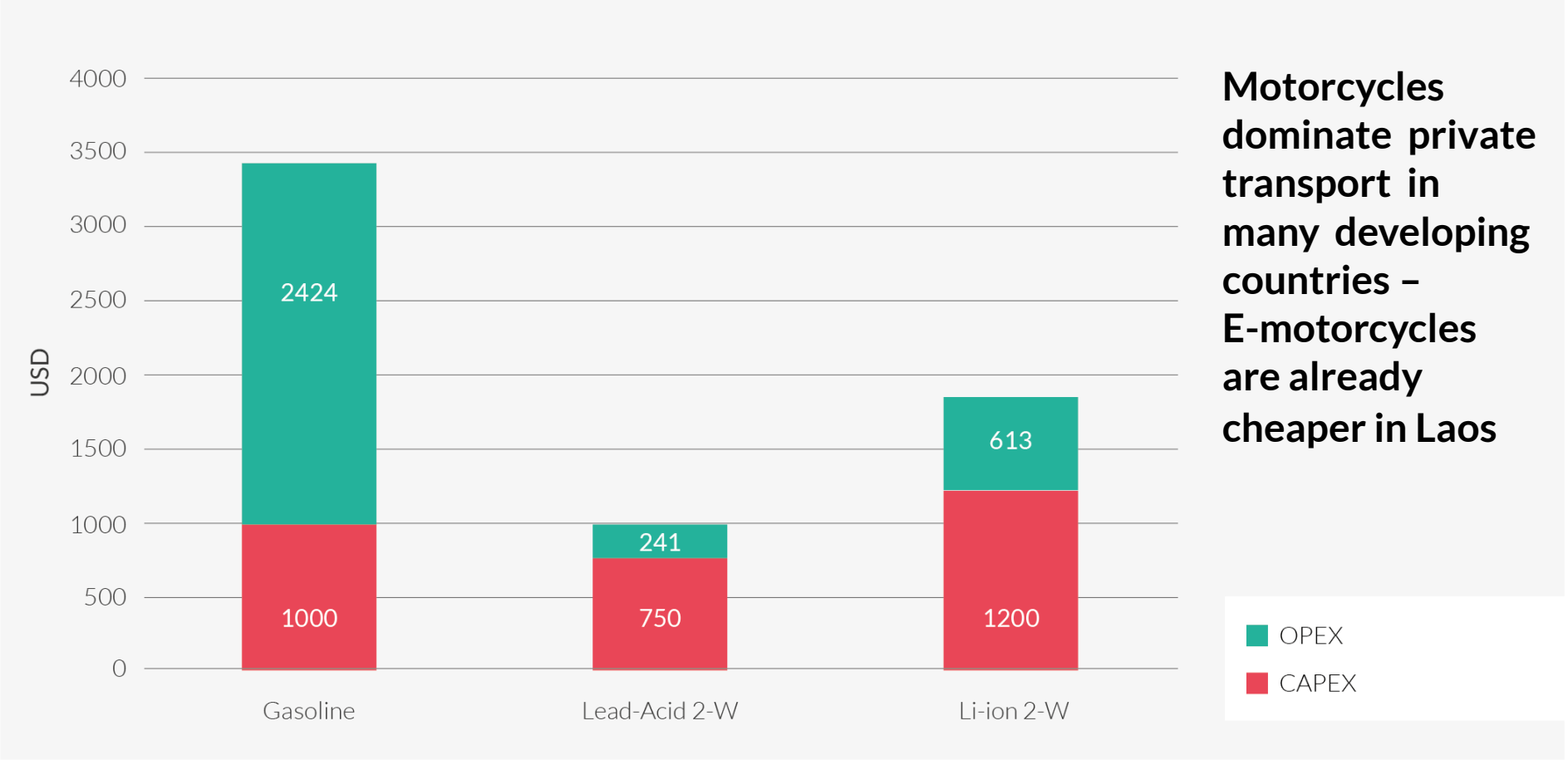
Figure 5. Total lifetime costs of bus options



Source: GGGI Analysis.

Electric Mobility

Total costs of ownership of gasoline and electric motorcycles in Laos



Motorcycles dominate private transport in many developing countries – E-motorcycles are already cheaper in Laos

Source: GGGI Analysis.

Smart cooking technology

- Around 3 billion people every day cook using open fires or rudimentary cookstoves fueled by coal or solid fuels, which hinders the health of the population, air quality, and environment.
- Research estimates that the adoption of advanced biomass cookstoves could have an impact equivalent to lowering CO2 emissions by approximately 25–50%.

Source: Global Alliance for Clean Cookstoves

Source: Global Environment Facility

Energy Efficiency: Green Buildings

- Buildings are responsible for an estimated 32% of global energy use and almost 30% of total GHG emissions.
- Heating and cooling energy requirements can be lowered by 50-90% through retrofitted buildings.
- New, energy-efficient buildings, in many cases, use almost zero energy for heating and cooling.

Drawing on Past Experience

Google.org, the charitable arm of Google, utilizes technology to address societal and environmental challenges and empowers advocates to share the value, responsibility, and accessibility of new and emerging technology.

BILL & MELINDA GATES foundation

The Bill and Melinda Gates Foundation invests in technologies that have the potential to have transformative impacts on the world. Searches for emerging technologies that have the possibility to address global health challenges.

GGGI

Intergovernmental organization established to accelerate the green transition

GGGI at a Glance

Headquartered in Seoul, Republic of Korea, GGGI has ***38 Members.***

(updated as of Q3, 2020*)

Supporting Partner Governments to Achieve the SDGs and NDCs

37

Work with 38 developing country partner governments to achieve their Nationally Determined Contributions (NDCs)

17

GGGI's more than 130 projects contribute to all of the 17 Sustainable Development Goals (SDGs)

(As of May 2020*)

Green Employment

Country examples

- In **Fiji**, a recent GGGI study estimated that jobs generated under a very high ambitious scenario could create 2.1 and 3.2 times more jobs by 2030 and 2050, respectively— mainly in ***electricity, transport, and forestry*** —compared to BAU.

- In **Uganda**, according to EPRC/GGGI/NCE (2016), the green growth transition could generate 1.3 million jobs by 2020, rising to around 4 million in 2040, compared to BAU. ***Sustainable agriculture*** offer the highest potential.

- In **Cambodia**, a recent GGGI analysis estimated that greening key industrial sectors of Cambodia—***food processing, bricks, garments, and electronics manufacturing***—through deploying energy, water, and other efficiency technologies, would provide an additional 512,000 jobs while reducing GHG emissions by 3.37 million tons relative to BAU by 2030.

Rwanda's Green New Airport

Rwanda: Green Certification of the New Bugesera International Airport

The Government of Rwanda (GoR) through the Ministry of Infrastructure (MININFRA) and GGGI have a standing Memorandum of Understanding (MoU) to advocate sustainability and provide support to the enable a sustainable built environment in Rwanda. GGGI has been supporting GoR in green cities development focusing in Kigali and the six secondary cities.

Along these lines, GGGI in collaboration with MINIFRA embarked on Green Certification of the New Bugesera International Airport. This project is looking into several measures to demonstrate resource efficiency and the overall sustainability of the airport infrastructure when completed.

Nepal's Success Story

Nepal: Advancing Green Growth in Nepal through Electric Mobility

Nepal's new electric buses will help the government fulfill its commitment under the country's Nationally Determined Contribution, which sets targets for air quality and electric vehicle adoption.

A collaborative effort by the Ministry of Forests and Environment, Ministry of Physical Infrastructure and Transport, and GGGI led to the launching of Nepal's first National Action Plan for Electric Mobility—a road map for achieving the NDC targets.

GGGI in Nepal: Integrating the first set of electric buses in Kathmandu for eco-mobility © BYD

Viet Nam's Success Story

Viet Nam: Solar Leasing Finance Facility (SLFF) Project

Viet Nam has great potential for solar rooftop development for 328 industrial parks nationwide. However, due to barriers such as cost-competitiveness, lack of appropriate financial mechanisms and inexperience of factory owners in the installation of solar rooftop systems, there is minimal solar rooftop development.

GGGI is providing support on developing a distributed SLFF for Viet Nam, which is an innovative financial instrument to overcome green growth barriers in the energy sector and is at the right-hand side of GGGI's value chain. The objective of the SLFF is to provide green finance for companies and industrial parks to access renewable energy efficiently and at scale.

PNG : Green Telecom Towers

Investment Overview (Readiness : Origination Phase)

- The proposed investment aims at funding the Energy Service Companies (ESCO) in PNG toward providing simple, efficient, and reliable power for telecom networks by replacing diesel fuel with solar hybrid system.
- A total of 100 towers operated by the major telecom operators in PNG is being targeted in the current phase. The total investment required is approximately US$20 million

Project Highlights

- Solar hybrid system addresses the two main challenges faced by the telecom tower companies in PNG
  - High operating expenditure: Energy costs account for ~30 to 40% of total operational expenditure for a telecom tower company.
  - Diesel pilferage losses ~20% have been observed in the industry which further increases the energy costs
- Pilot project in PNG has demonstrated the following benefits
  - Monitoring of the project during the first year of operation has revealed an operational cost saving of over $40,000 and a 72% reduction in diesel fuel consumption.
  - Reduced maintenance requirements and increased service intervals.

Project Characteristics	
Location	100 Telcom towers in urban and semi-urban areas of PNG
Asset ownership	ESCO
Cost of Solar Hybrid system	US$ 150 – 200k per unit
Capital Structure	TBD
Contract Period	10 - 15 years
Funding	ESCO
O&M	ESCO
Risk	Risk sharing between Tower company and ESCO
Expected Payback	7 – 8 years

Investment in Solar Freezers Project, Vanuatu

Investment Opportunity

- Solar-powered freezer systems installed at ten rural tourism bungalows on five islands in Vanuatu
- Project Partners: GGGI, Vanuatu Government, Vanuatu Skills Partnership
- Improve electricity access, reliability, and affordability for small tourism operators
- Increase and improve income streams for tourism operators
- Contribute to Vanuatu's Nationally Determined Contribution and updated National Energy Road Map objectives to increase the use of renewables in all sectors

Key Investment Highlights

- Improved productivity
- Increased revenues
- Easier work for men and women
- Less travel time required to buy food
- New income streams: selling cold drinks and ice pops, renting freezer space
- Increase knowledge on PV systems and on safe food handling
- Increased business for PV suppliers
- Freezer systems provided free of charge under a grant agreement with the Vanuatu Government
- Owners required to save money each month in a special savings account used for maintenance and repairs
- Estimated average savings per bungalow of USD $100 per month

Conclusions

- There is an unprecedented *Sustainability Crisis* – Climate Crisis, Plastics Crisis, Air Pollution Crisis, Species Extinction Crisis, Health Crisis….
- Awareness of the urgency to save the environment is spreading across the globe
- All groups must collaborate to develop and implement new, effective ways to make the green transition
- Green technology and innovation is critical to addressing the sustainability crisis and intellectual property rights are essential to supporting new technology and innovation for the green transition

Thank You

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