REPUBLIC OF KENYA

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Webinar 1

Introduction of Renewable Energy Concept

1. Introduction to renewable energy systems

30 Nov 2022

Andra Backhaus
Renewable Energy and Management

Brian Nyaware
Energy Specialist - Kenya

2. Understanding the energy sector in Kenya

18 Jan 2023

3. Key energy issues, trends, and policy objectives

28 Feb 2023

4. Understanding needs in energy reporting

29 Mar 2023

Training and Capacity Building on Energy Policy and Communication in Kenya

- "Power System Readiness for Integration of Variable Renewable Energies (VRE)“

- National key actors and relevant energy stakeholders

public agencies, non-profit organizations, journalists, the private sector and academic institutions

- Equip stakeholders with the knowledge, tools and skills to undertake effective strategic communications and policy translation

- Sustain energy investments, and enhance consumer demand for power produced from variable renewable energy sources

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How do you feel today?

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- Introduction to the climate change story
- The energy transition put into perspective
- The role of Renewable Energy
- RE and non-RE: what, where and why
- Key units of measurement
- Everyone has a role to play

The Climate Change Story

- Burning fossil fuels
- Releasing GHG into the atmosphere
- Traps more thermal energy
- Rise of global temperature
- Dry places become drier and wet places wetter

We know what the problem is

↓

solutions that are presented to us are quite straight forward

↓

no significant action seems to be enough

Stages of the Public Debate

Climate change **is not real**

Climate change is real, but **it is not caused by humans**

Climate change is caused by humans, but **it is not that bad**

Climate change **is bad and inevitable, we are doomed**

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What do you think is the next stage of the public debate?

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Quick Vocabulary Recap

Mitigation

Actions to prevent climate change

Preparedness

Actions in expectations to implications of climate change

Adaptation

Actions in responses to current symptoms of climate change

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What do you associate with the fight against climate change?

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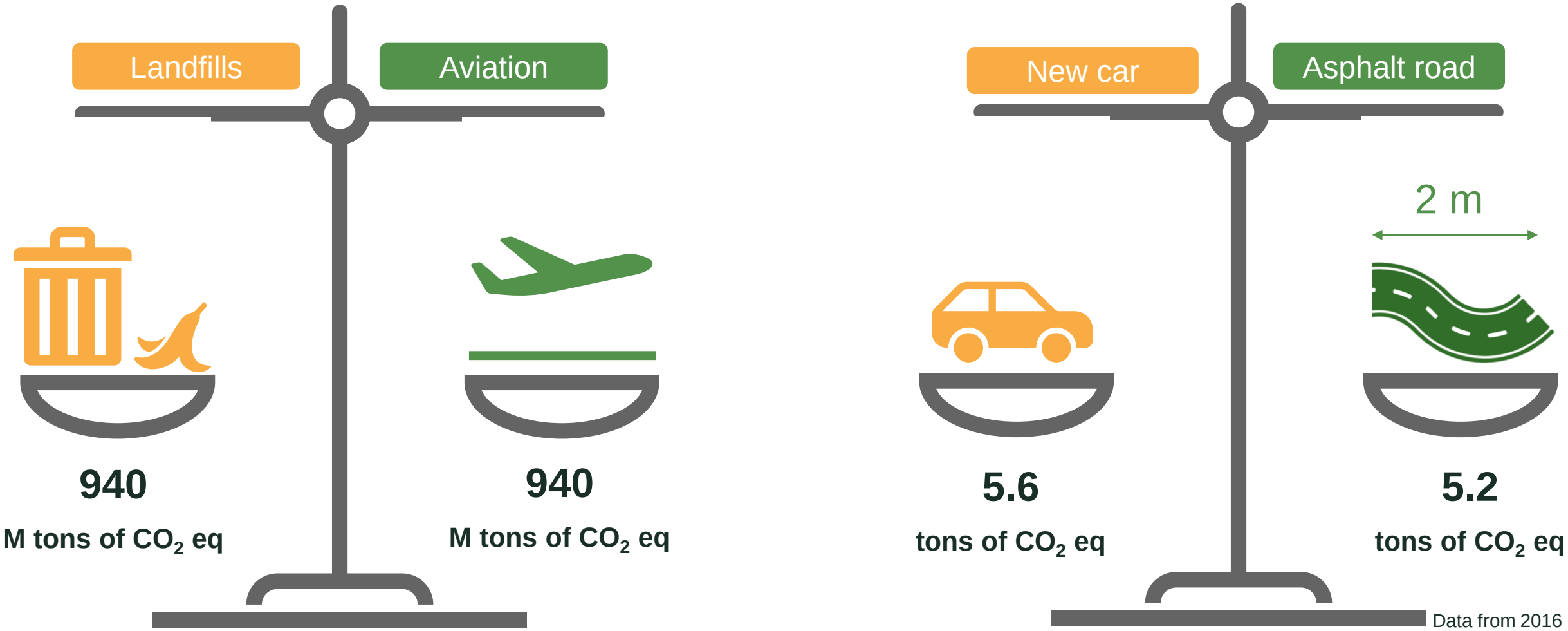
Public Debate Put into Perspective

Public debate is often focused on certain **key emitters**

- This creates wrong associations and guides the discussion towards basic and simple solutions
- E-mobility, RE technologies, recycling and sustainability

Counterintuitive Truth



Data from 2016

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Rank these in order of importance in order to achieve a complete energy transition

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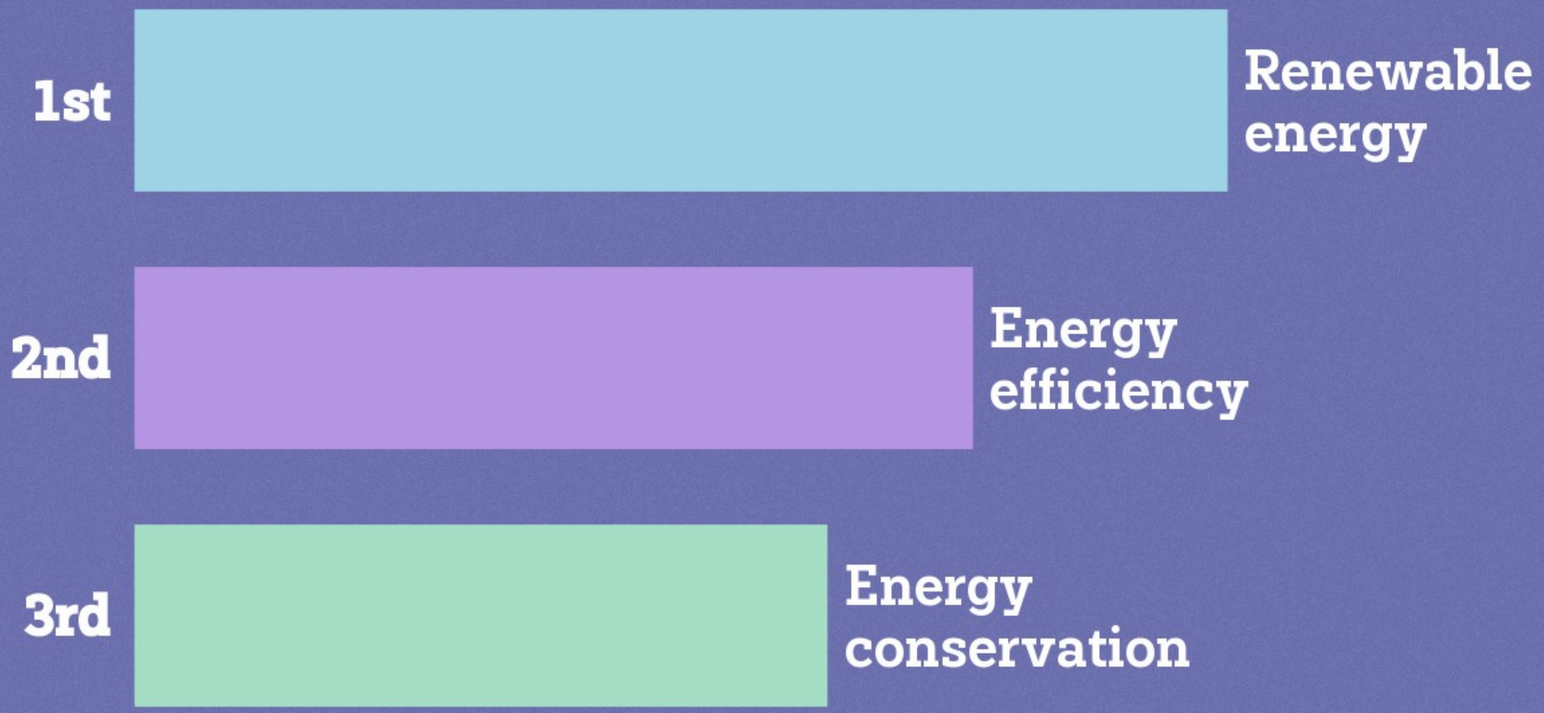

Note from presenter:
This order of importance reflects exactly how we persent the energy transition today. In realitiy, the importance of those three tiers of the energy transition are reversed, see energy pyramid.

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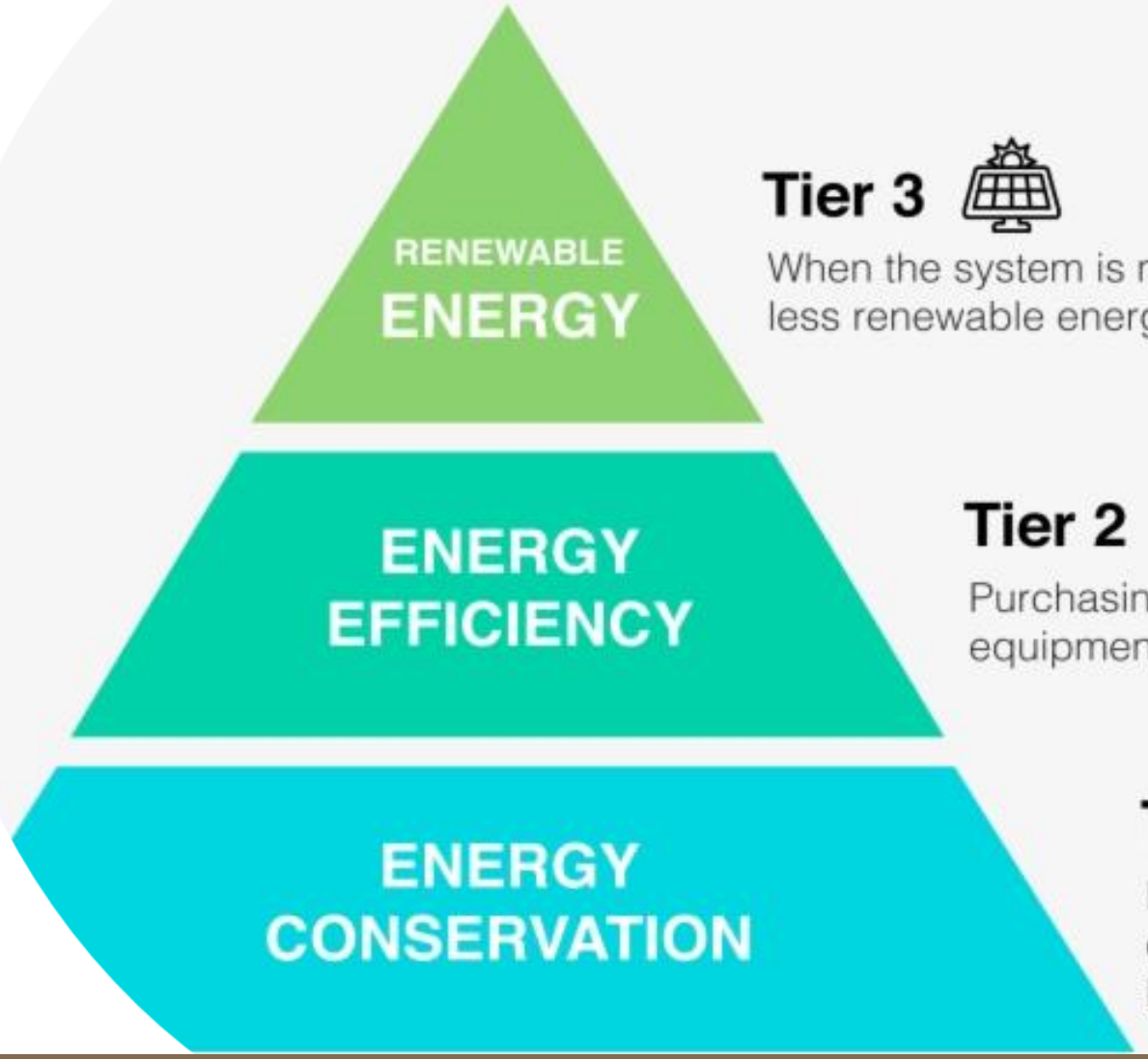
Renewable energy yes,

but not only



Tier 3

When the system is modified to use efficiency, less renewable energy is needed

Tier 2

Purchasing and installing efficient equipment and processes

Tier 1

Largely based on behavioural & operational practices.
Best return on investment.

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These are RE technologies

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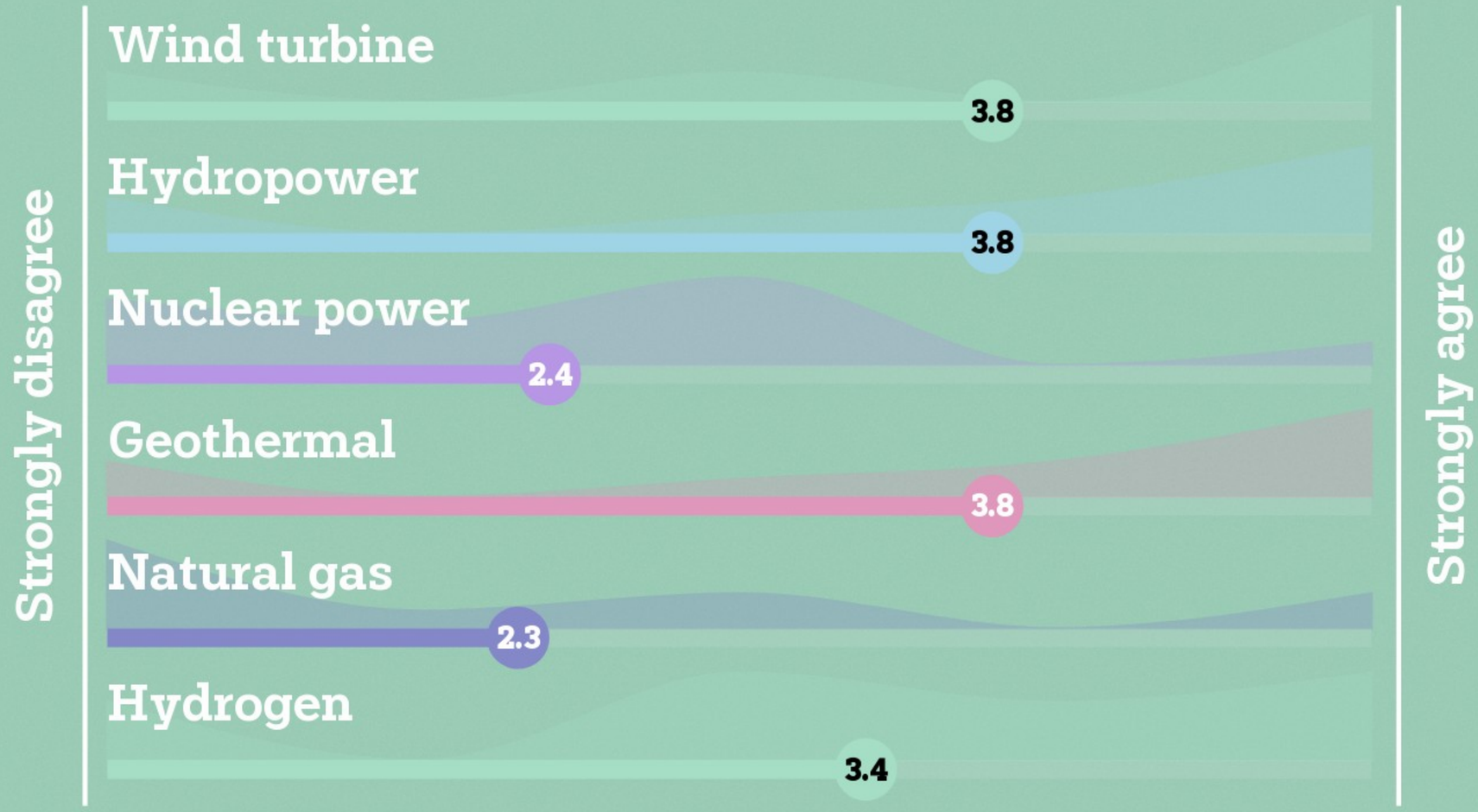


Note from presenter:
Wind turbine, hydropower, geothermal are RE technologies
Nuclear power is qualified as "clean energy"
Natural gas is a fossile fuel, the opposite of RE
Hydrogen is a gas that can be produced using any type of source. Check the colors of Hydrogen to learn more about the topic

Renewable and Non-Renewable

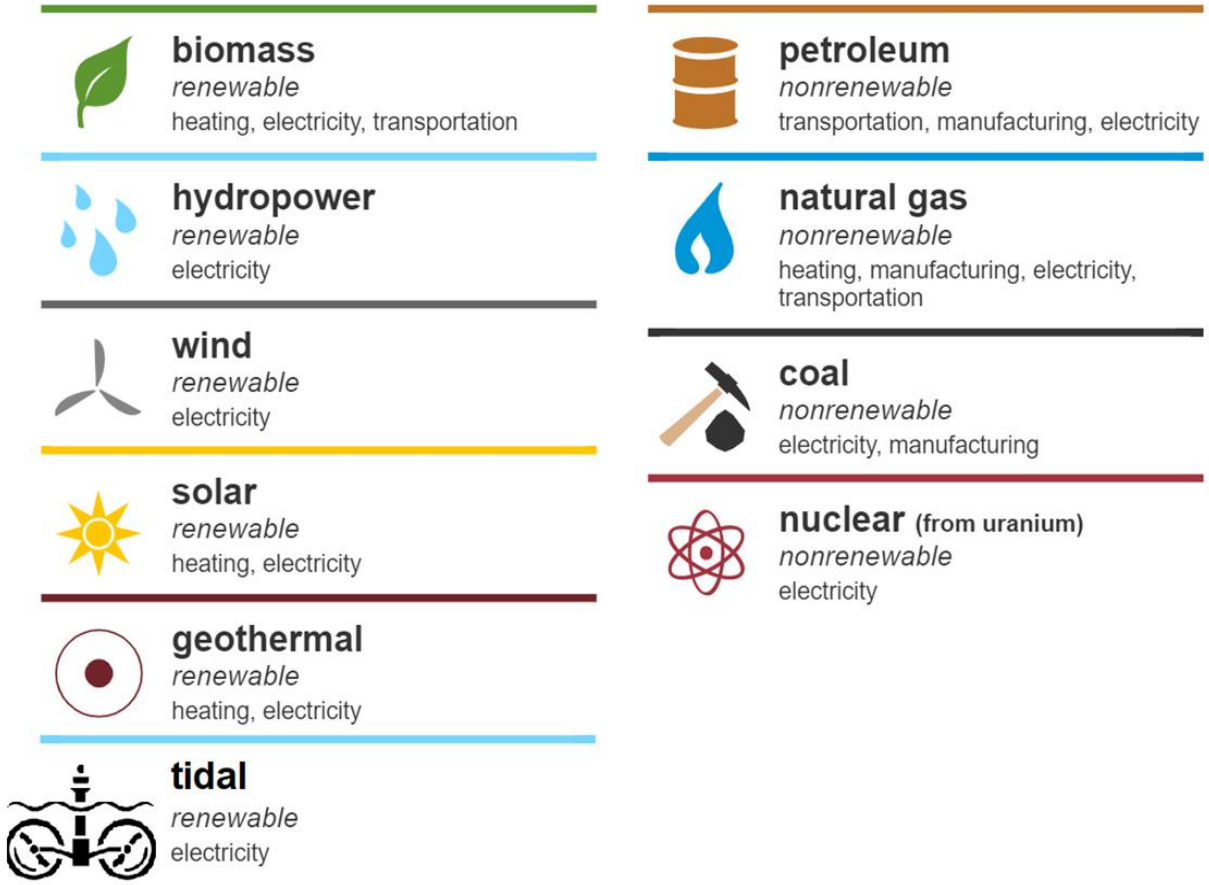
Why?

- A *key mitigation measure against climate change* i.e. efforts to prevent or lower GHGs emissions
- RE *costs are lowe*r compared to Non-RE sources (SDG 7–affordability)
- *Improving energy portfolios* of countries (incase one source is incapable of efficient supply, demand is still met)

What and where?

- RE refers to energy produced from natural resources that are replenished faster that they are consumed
- Locations are heavily reliant on resource availability and environmental conditions (e.g solar PVs have to be installed in areas with good solar insolation, geothermal has to be in areas with high geothermal resources...)
- Non-RE is energy gotten from resources that cannot be replenished as fast as they are consumed

Renewable and Non-Renewable Energy



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Renewable Energy & Clean Energy

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Yes

No difference

There is a difference

No difference

Energy can be renewable and not clean eg biomass.

yes, clean is processed to ensure few emmissions

yes

Yes. There is a difference in terms of environmental impact but energy is the same energy is energy

Yes.

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Renewable Energy & Clean Energy

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LPG is ckean but is from caborn

Yes, nuclear energy is clean

Reduced illnesses, clean oxygen disadvantages include high cost, stable,

Note from presenter:
There is indeed a difference between clean energy and RE

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Renewable Energy systems

- **On-grid:** energy systems that are connected to the utility grid systems
- **Off-grid:** energy systems that are not connected to the utility grid systems
- **Mini-grid:** is a set of small-scale electricity generators interconnected to a distribution network that supplies electricity to a small, localized group of customers, operates independently form the national grid
- **Micro-grid**: a small-scale power grid that can operate independently or collaboratively with other small power grids

Renewable Energy

RE Advantages

- natural replenishment
- low to zero carbon emissions/ less pollution
- cheaper compared to non-Res
- better reliability and resilience
- green jobs potential
- versatility in terms of grid connection and generation capacity (e.g. possible to install in remote areas)

RE Disadvantages

- higher initial costs
- intermittent nature
- hard to store energy
- dependent on location and environmental conditions

Key units of measurement

Percentage of renewable energy is calculated by dividing the consumption of primary renewable energy by the total gross inland consumption of energy. (%)

Watt-hour (Wh)- unit that measures the amount of electrical energy used over a period of time.

Watts (W)- measure of rate of power (rate of energy is produced or consumed) over a period of time.

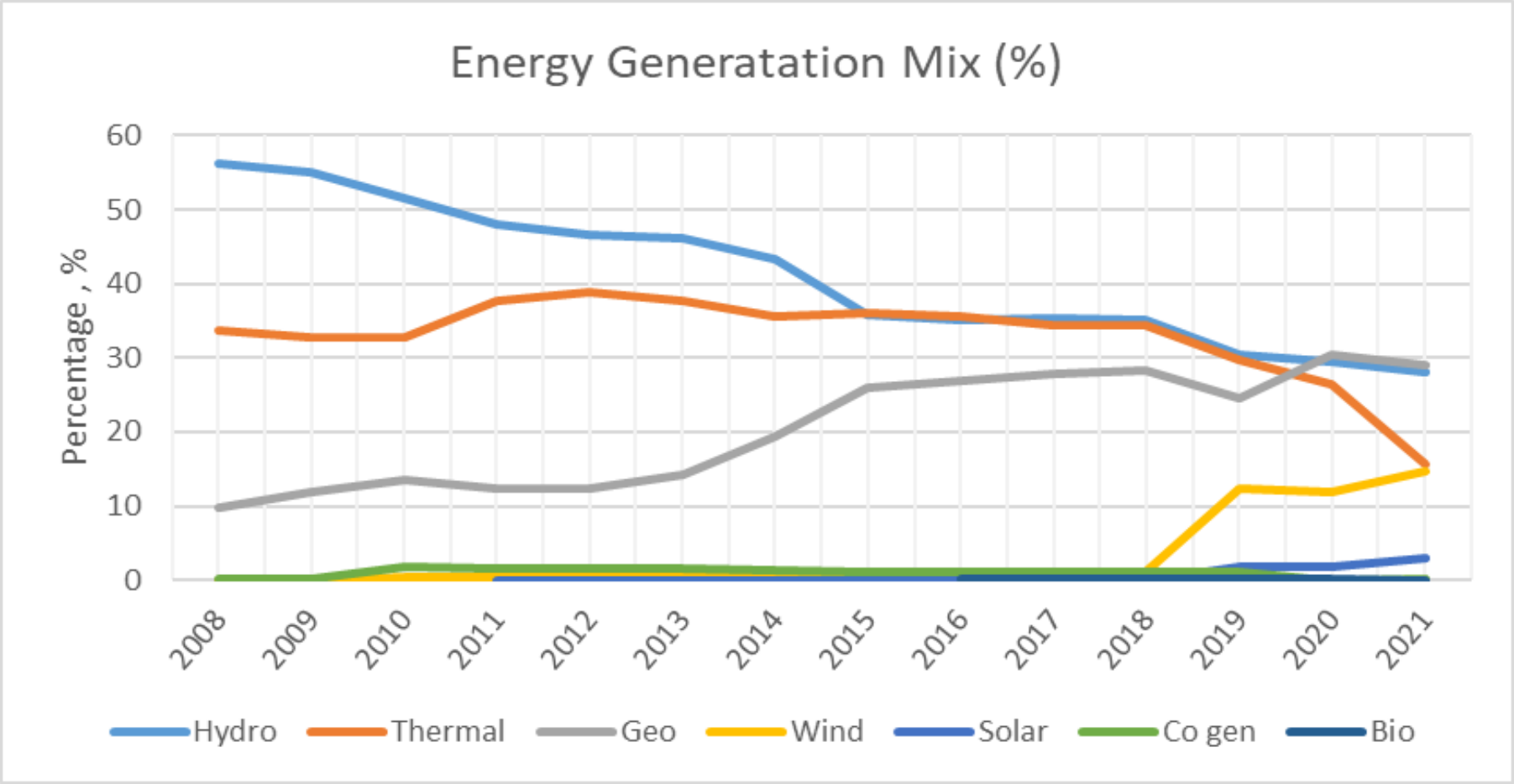
Kilo=1000; Mega=1000000

Installed capacity is the maximum possible power that can be produced (MW)

Generation capacity is the actual amount of power produced (MW)

CO2 eq is a unit of measure used to compare the emissions from various greenhouse gases based upon their global warming potential

Energy Mix in Kenya



Successes and Challenges

RE Successes

Over 80% share in Kenya's energy mix, incorporated in Kenya's development agenda, green jobs, reduced pollution, stabilized lower prices, improved overall health

RE Challenges

Energy market shocks have prompted readoption of Non-RE, disposal of E-waste, lack of finances, lack of supporting policies and incentives, existing Power Purchasing Agreements (PPAs) and investments in Non-renewables, Non-RE are considered better for grid stabilization

disadvantage and advantages - Success and challenges reactions

Stuck in a Vicious Cycle

If renewable energy has so many advantages, why are we still relying so heavily on fossil fuels

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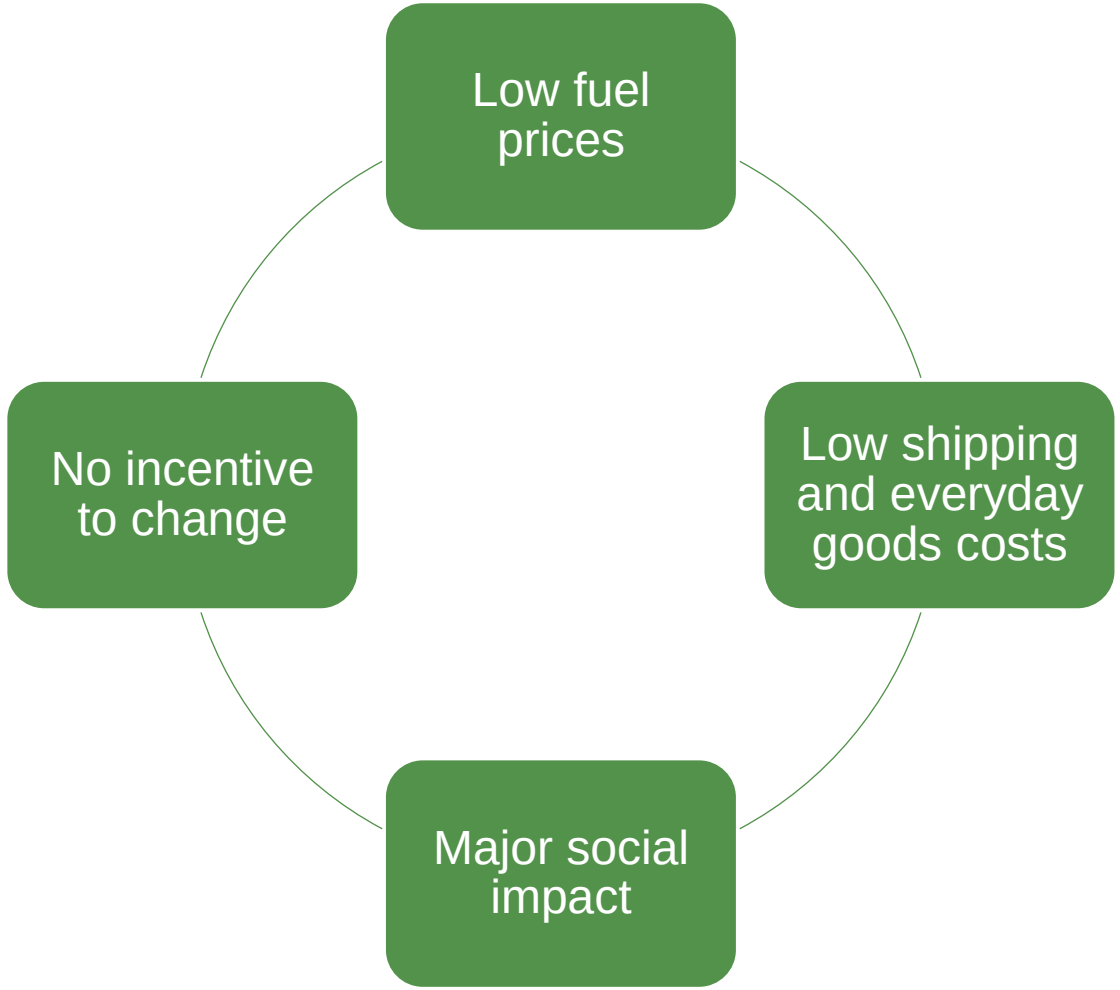


What About Policies ?

- The last decade has been a failure for climate policies around the world
- Not enough new laws and binding treaty

Putting Pressure on the Individual

- Why don’t **you** do more ?
- If you don‘t have the money or time for this, **you should feel bad**
- Shifting the responsibility from the largest emitters to the average individual is just easier

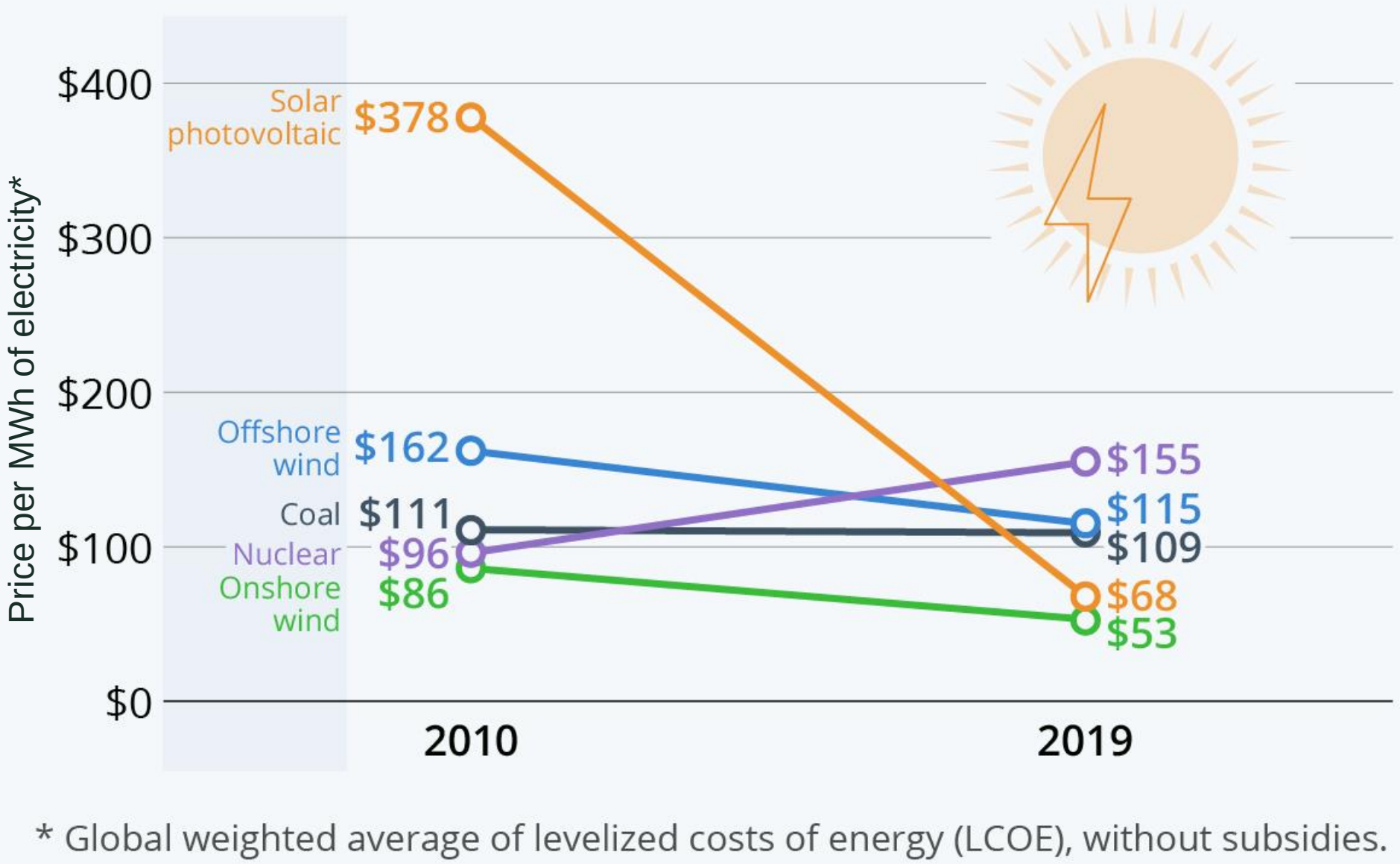
- **This is an effective message because it is true!**

Back to a Complex System

- Global experiment brought by the covid-19 pandemic
- Resulted in a reduction of the overall CO_2 emissions by 7% in 2020
- Personal changes are **necessary**, but they are not the magic solution
- The concept of personal footprint was popularized by BP in 2005
- The importance of our impact can be put into perspective quite easily

Growing Is Polluting

It is not so true anymore



* Global weighted average of levelized costs of energy (LCOE), without subsidies.

Take Home Message

Doing one action in one area of concern won‘t stop climate change,

but we cannot stop climate change without those actions

We need a systemic change

REPUBLIC OF KENYA

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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Tell us how feel after this session

Share your feedback

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The presentation was good, timely and on point. Thanks

Thanks for the webiner looking forward for the next one

Thanks

The training has come at the right time when Kenya is grappling with climate change effects in almost all parts of the country. I am looking forward to the next session next year.

A good one, but I feel in _person training would be more effective ,for more interaction and will also cushion participants from the challenges brought about by poor penettration of internet and network in some areas.Thanke Samuel Musita ,KBC.

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