

ROLE OF POLICIES AND REGULATORY FRAMEWORKS TO ACCELERATE GREEN INNOVATION



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presentation at the

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Green Innovation**

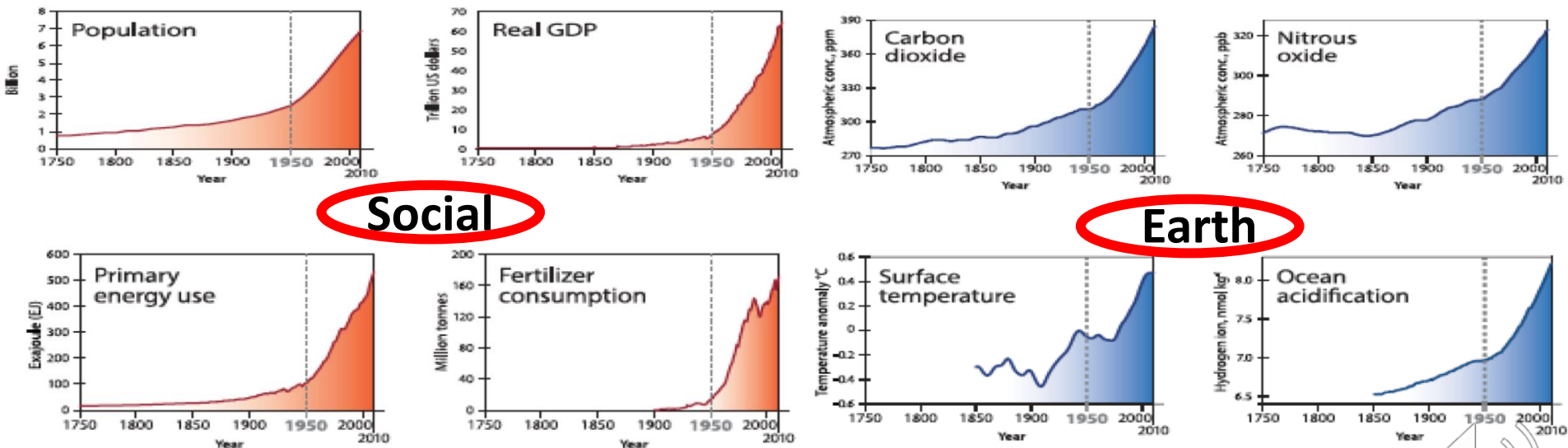
Tashkent, Uzbekistan and online

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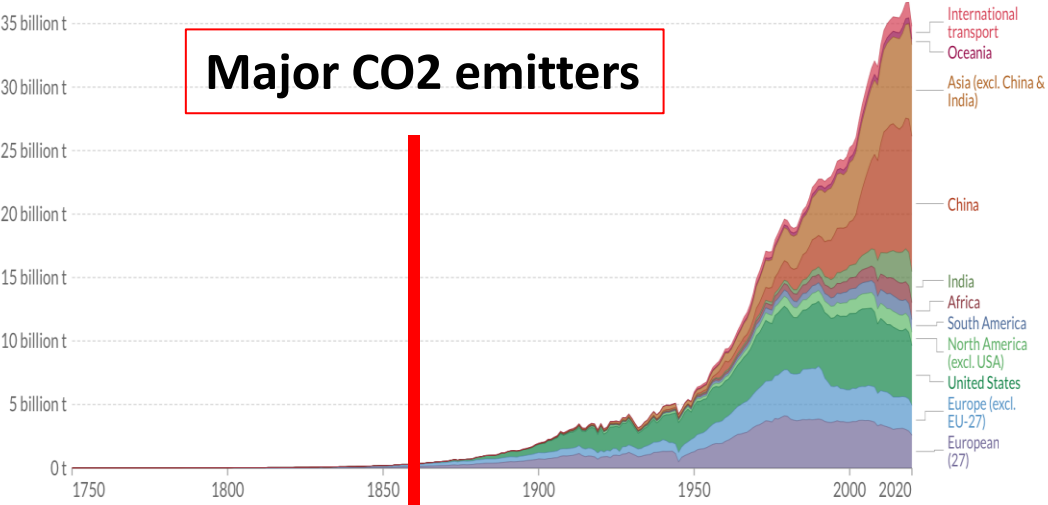
GREEN INNOVATION AND ITS NEED TODAY

- **What is green innovation?**
 - Green innovation generally refers to the creation of new and competitive products, services, processes, and systems which
 - uses renewable resources and minimum non renewable resources,
 - limits environmental damage, impact, and degradation, and
 - provides better quality of life for all.
 - Green innovation has a strong resonance to sustainable development.
- **Why green innovation today?**

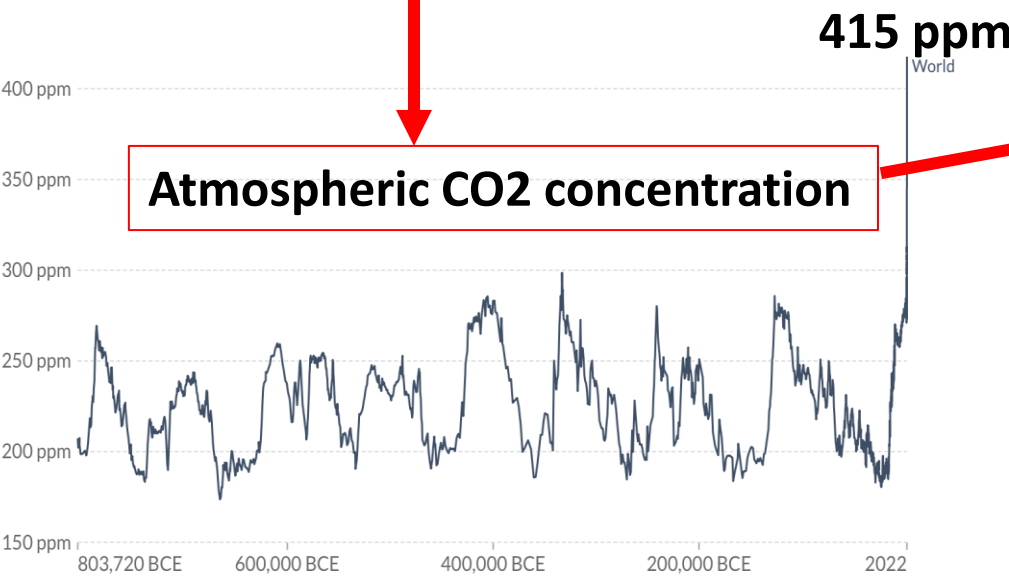


CO2 EMISSIONS, CO2 CONCEN. and TEMPERATURE

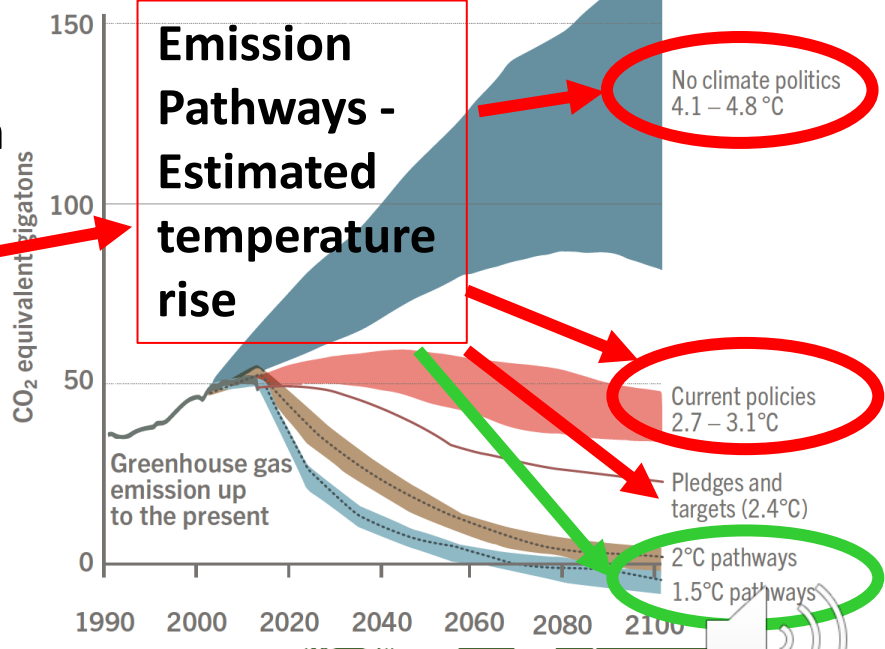
- More than 35 billion tonnes of CO2 emitted per year.
- A 45% increase in CO2 concentration since 1850 to about 415 ppm today.
- Emissions to be reduced so that the global temperature rise is below 1.5C by 2100.



Source: Global Carbon Project
 Note: This measures CO₂ emissions from fossil fuels and cement production only - Land use change is not included. 'Statistical differences' (included in the GCP dataset) are not included here.



Source: National Oceanic and Atmospheric Administration (NOAA)

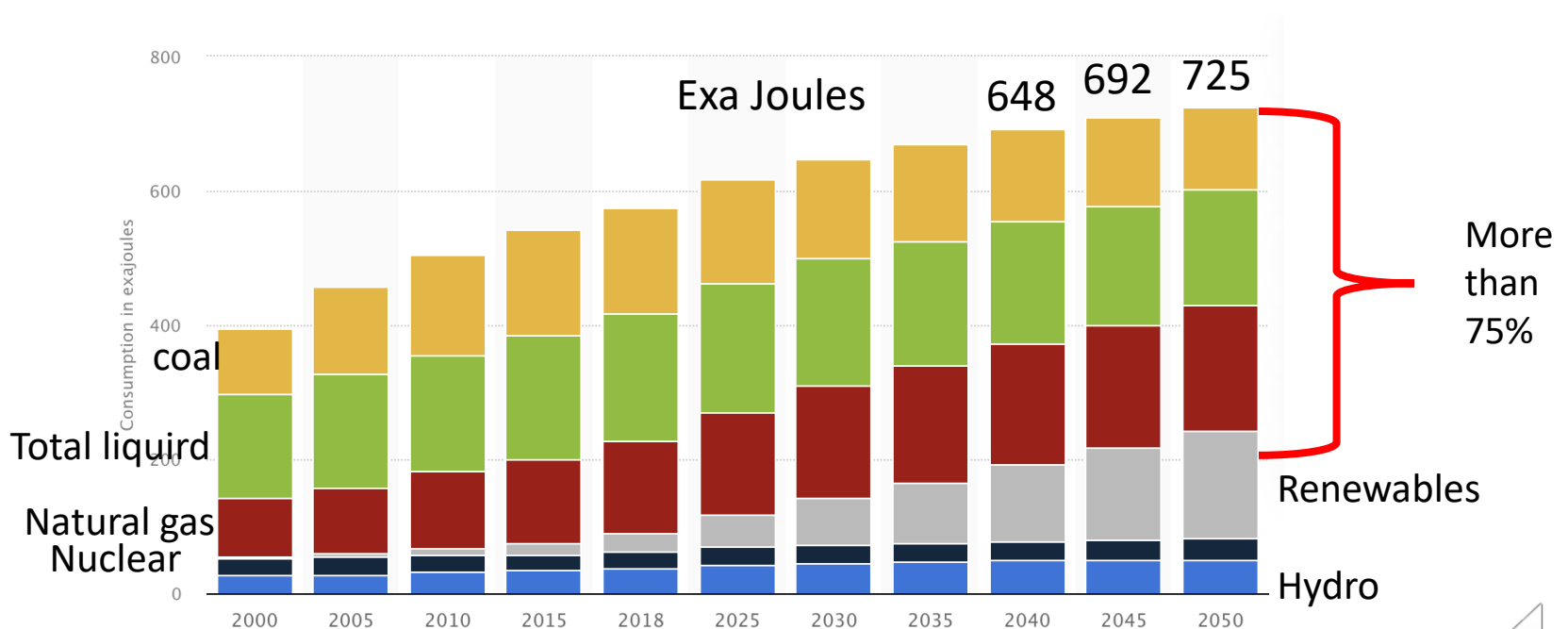


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GLOBAL PRIMARY ENERGY DEMAND TREND

- Cause for GHG emissions – use of fossil resources. Their share is significant. Also, it is expected to increase by 48.4% by 2050.
- Green innovation is essentially development and deployment of renewable energy based technologies, along with promoting energy efficiency and providing modern energy to all. This is to be done in all sectors.



Source: Statistica

● Hydroelectricity
 ● Nuclear energy
 ● Renewable energy**
 ● Natural gas
 ● Other



IMPORTANT DRIVERS PROMOTING GREEN INNOVATION

- Decarbonization
 - taxes on fossil resources, electric mobility
- Decentralization
 - a large number of multi-level producers and consumers, development of micro grids
- Digitalization
 - use of digital machines and devices at all levels of the power system, from production and infrastructure to end-user devices.
- To address the Paris Agreement and 1.5C, in the ASEAN, countries
 - have their set goals on RE targets, and some towards net zero as well.
 - Many large initiatives in solar and wind power systems
 - Innovation eco system in the region (National Innovation Agencies with clear mandates)
- Citizens with mindset towards promoting sustainability principles



POLICIES PROMOTING GREEN INNOVATION

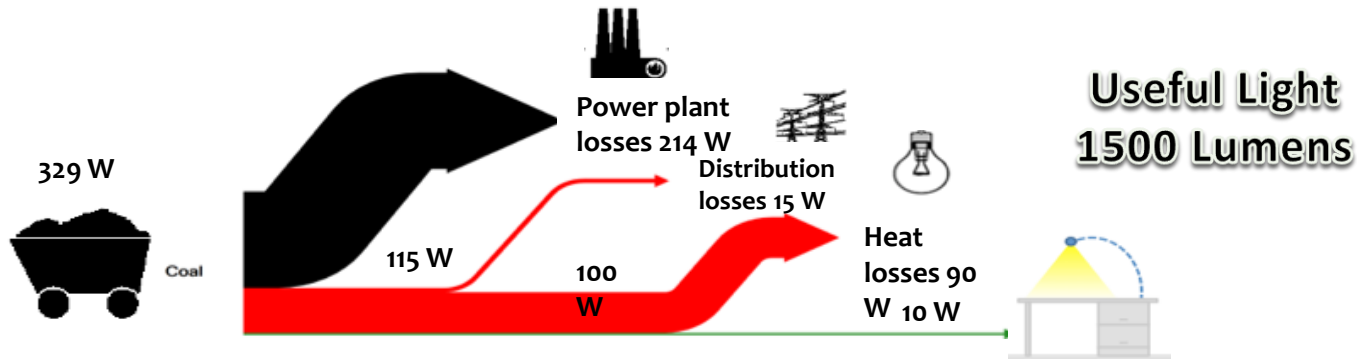
- Funding support for research, development and demonstration of cleaner technologies
- Providing intellectual property protection for cleaner technology developers,
- Building infrastructure for testing of renewable energy devices, products, and support for laboratories,
- Capacity building and skills development in green technology development, installation and trouble shooting ,
- Incentivizing linkages between various stakeholders, such as, university-industry collaborations, promoting international cooperation,
- Providing financial incentives (eg. tax credits, tariffs, subsidies),
- Developing standards and regulations (eg. Labels),
- Working with international policy instruments (Paris Agreement, etc)
- Ensuring policy stability

Each country would develop norms and variables for the above based on their local circumstances and needs



GREEN INNOVATIONS IN THE LIGHTING SYSTEM

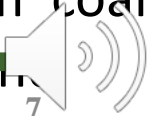
Initial: Using coal to produce electricity for lighting with incandescent lamp



One improvement: 329 W to 83 W: 75% less energy by switching from incandescent to Compact Fluorescent Lamps (CFL) – improving end use technology (Factor 4).

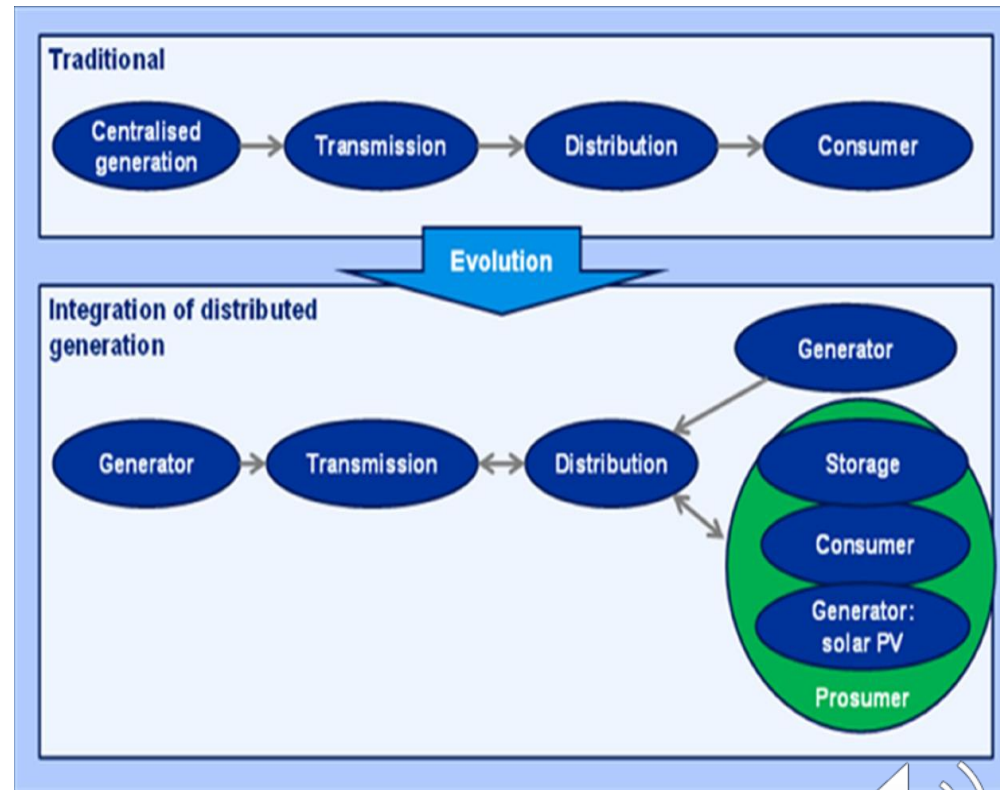
Next improvement: 83 W to 48 W: 90 % less energy by switching from CFL to Light Emitting Diodes (LED) lamp- improving end use technology (Factor 7).

Next improvement: 48 W to 18 W: 90 % less energy by switching from coal to PV - improving supply side technology and reducing transmission and distribution losses (Factor 18).



PROSUMPTION AND PROSUMER

- A prosumer is a person who buys a product, uses it, and also spreads the word about it. Prosumption involves both production and consumption rather than focusing on either (production) or on (consumption).
- Applicable in homes/buildings by PV, in industries by biomass
- A prosumer improves efficiency (by demand reduction, demand response, energy storage and micro-generation) and allows flexibility to energy users.
- Some policies promoting prosumption:
 - Access to grid - standard interconnection rules, transparent process, net metering, and long term agreements.
 - Financial incentives - FiT and tax reforms (reducing systems cost),
 - Promoting market access - peer to peer power sharing, tendering, and new business models.



INNOVATIONS USING BCG ECONOMY

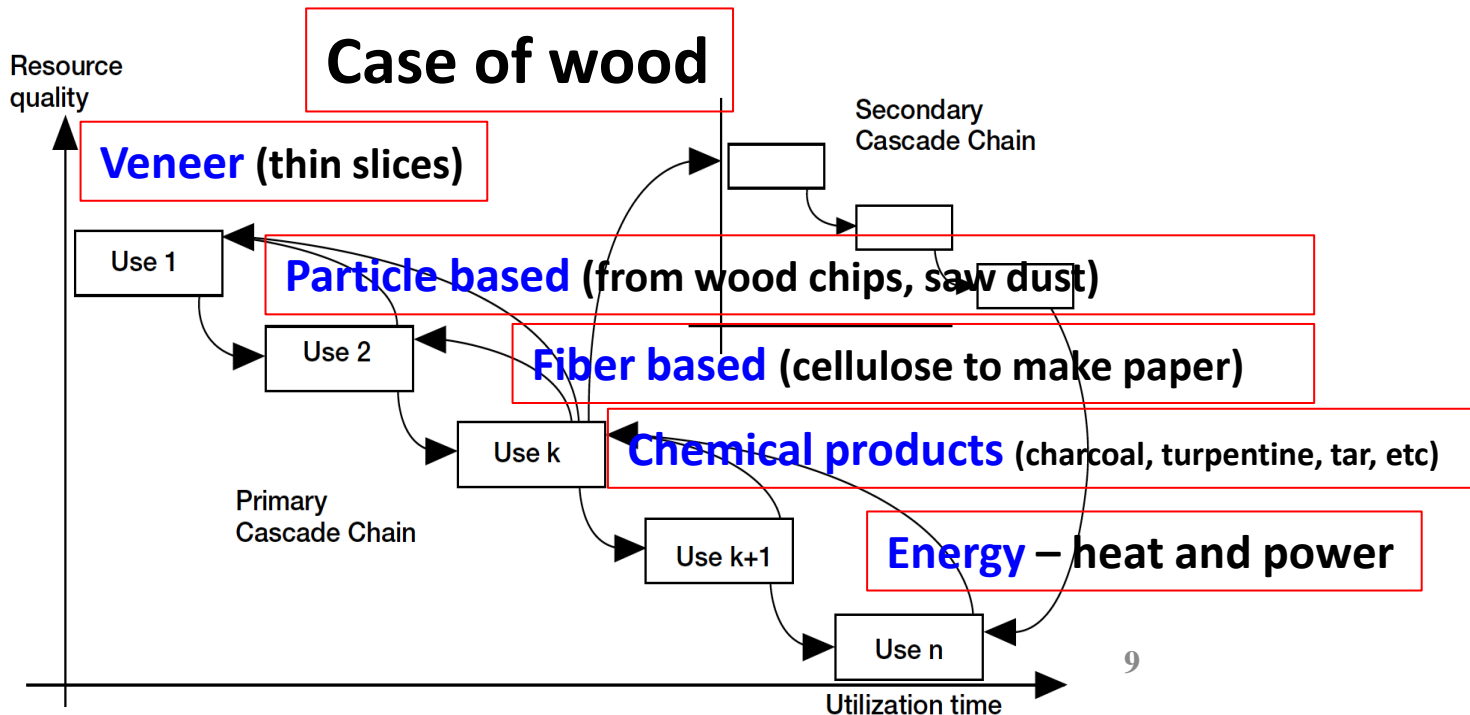
Four application directions

- Chemicals
- Value Products
- Food
- Fuels and Energy

• Two focus areas

- Principle of cascading
- Improving resource efficiency

4 sectors:
food and agriculture;
medical wellness;
bio energy,
biomaterials, bio
chemicals; and
tourism and
creative economy,



4 enablers:

regulatory frameworks,
infrastructure and facilities
development, capacity building, and
global networks

Source: Adapted from Bas Erickhout, 2012



SUMMARY AND CONCLUSIONS

- Need for emission reduction and the possible emission pathways are known – 1.5C. So, green innovation is a key requisite.
- Policies are important to accelerate green innovation as fossil technologies are well entrenched. Encouraging drivers for green innovation are in place.
- Development of technologies
 - new energy technologies (eg. battery, renewable energy, EV, etc)
 - technologies to facilitate energy use (eg. sensors, IoT), data, and
 - AI - forecasting renewable resource, energy management, etc
- Financial measures
 - tariffs (non green technologies, incentives (green technologies)
 - Regulations and standards
 - Circular economy, promoting presumption
 - Funding for R and D, infrastructure set up
- Information dissemination and awareness creation
 - availability of data, analysis, and transparency.
 - Capacity building, international cooperation, etc
- This can lead to behavioral change – the most important measure for mitigating global warming – the *raison d'être* for green innovation.





THANK YOU

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