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Cyborg Cockroach

A team of researchers led by Japan have devised a system that can create cyborg cockroaches, to help in urban search-rescue missions.

- Cyborg cockroach is a remote-controlled insect wearing a tiny backpack of solar cells and electronic hardware.
- Cyborg cockroaches will used to conduct surveillance in procedures like urban search and rescue, environmental monitoring and inspection of areas dangerous to humans.



- Cyborg cockroaches are part insect and part machine.
- The insect's movements are controlled by tiny integrated circuits.
- The 3D printed soft backpack is connected to the insect's nervous system to control its leg segments.
- With this small wireless control modules, handlers will be able to control the insect's legs remotely for long periods of time.
- The cyborg suit is powered by rechargeable thin solar film.
- The backpack and film can be removed, allowing the roaches to go back to normal life.
- **Madagascar Hissing cockroaches** are used in Cyborg cockroaches.
- They are the largest species of cockroaches and estimated to reach up to 6 cm.
- They are known for making hissing sounds when disturbed, which they make by expelling air from the openings on their back.
- The Madagascar Hissing cockroach is wingless, and can turn itself over after falling on its back, even if it is wearing the cyborg suit.

References

1. The Hindu - What Is A Cyborg Cockroach And How Can It Save Lives
2. Indian Express – Cyborg Cockroaches To Help In Urban Search Rescue Missions

Passkeys

A consortium of companies like Microsoft, Apple, Google have unified around a single passkey standard as passkeys, a new type of login credential are alternative to passwords.

- Passkeys could bring a safer alternative to passwords as they cannot be reused, do not leak in server breaches, and protect users from phishing attacks.
- A passkey is a digital credential, linked with the user account and a website or application (app).
- It allows users to authenticate without entering a username, password, or providing

any additional authentication factor.
- Users can create and use passkeys on Android devices, which are securely synced through the Google Password Manager.
- Developers can build passkey support on their sites for end-users using Chrome via Web Authentication API (also known as WebAuthn).
- Passkeys are built on industry standards and work across different operating systems (OS) and browser ecosystems, and can be used for both websites and apps.

Password	**Passkey**
A password is created for an account particularly and typically used together with username.	Passkeys are built on the Web Authentication standard, which uses public-key cryptography.
Passwords can vary in length and can also contain special characters, letters and numbers.	With passkeys, users can identify themselves using fingerprint or facial recognition or a PIN or swipe pattern.
The Password are created by the users for every account and they should be unique and only known to the user.	The passkeys are generated by the device securely and uniquely for every account.
A password uses a string of characters for identification. The user enters the password manually or use password managers to authenticate login.	The device creates a unique pair of mathematically related public and private keys. The public key is stored on the server and allows the website or app to verify your account after receiving a matching private key.
The users need to remember passwords.	The users do not need to remember passkeys.
Passwords have security issues such as breaches, phishing and stolen identities.	Passkeys reduces data breaches and other security vulnerabilities.

References

1. Business Standard – Passkeys Becoming A Safe Alternative To Passwords Google Vice-President

Vultures of Tamil Nadu

Tamil Nadu is home to four species of vultures and the State Government is building an institutional framework for its effective conservation.

- A total of 9 species of vultures are found in India.

Resident	**Migratory**
1. White–rumped vulture 2. Indian vulture 3. Slender-billed vulture 4. Red-headed vulture 5. Bearded vulture 6. Egyptian vulture	1. Cinereous vulture 2. Griffon vulture 3. Himalayan vulture

- To know more about the conservation efforts, Click here
- Union Environment Ministry launched Vulture Action Plan 2020-25 for conservation of vultures.
- 4 of these vulture species are found in Tamil Nadu.
- The Government of Tamil Nadu has constituted the State-level Committee for Vulture Conservation. To know more about this, click here.
- **White-rumped vulture**

    a. Scientific name – *Gyps bengalensis*
    b. Conservation Status
        i. IUCN status – Critically Endangered
        ii. CITES – Appendix II
    c. Habitat – Forest, Savannah, shrub land and grassland
    d. Spread – Indian Sub-continent and southeast Asia
    e. Distribution in India – Found throughout India
- **The long-billed vultures or Indian Vulture**

a. Scientific name – *Gyps indicus*
b. Conservation Status
    i. IUCN status – Critically Endangered
    ii. CITES – Appendix II
c. Habitat – Forest, Savannah, grassland and rocky areas
d. Spread – India and Pakistan
e. Distribution in India - Peninsular India.

- **The Asian king-vulture or Red-headed vulture**

a. Scientific name – *Sarcogyps calvus*
b. Conservation Status
    i. IUCN status – Critically Endangered
    ii. CITES – Appendix II
    iii. CMS - Appendix I
c. Habitat – Forest, Savannah, shrub land and grassland
d. Spread – South and Southeast Asia
e. Distribution in India - sparsely distributed. Common in the west Himalayan foothills and in the Western Ghats.

- **The Egyptian vulture**

a. Scientific name – *Neophron percnopterus*
b. Conservation Status
    i. IUCN status – Endangered

    ii. CITES - Appendix II
    iii. CMS - Appendix I
c. Habitat – Savannah, Shrub land, Grassland, Wetlands, rocky areas and deserts.
d. Spread - South Asia, Indian subcontinent, Arabian Peninsula, northern Africa. Migratory in nature.

References

1. The Hindu - Saving the Vultures of Tamil Nadu
2. Indian Express – International Vulture Awareness – Nine Species -India-Maha - Conservation
3. Down-To-Earth - Conservationists In Tamil Nadu Welcome Formation Of Vulture Conservation Committee In State

Emissions Gap Report 2022

The United Nations Environment Programme (UNEP) released the Emissions Gap Report 2022

- The annual report provides an overview of the difference between where greenhouse emissions are predicted to be in 2030 and where they should be to avert the worst impacts of climate change.

Key Findings

- The 2022 report finds that the international community is falling far short of the Paris goals.
- To meet the Paris Agreement goals, the world needs to reduce greenhouse gases by unprecedented levels over the next eight years.
- The world must cut emissions by 45% to avoid global catastrophe.
- Current policies alone would lead to a 2.8°C hike, highlighting the temperature implications of the gap between promises and action.
- Unconditional and conditional NDCs are estimated to reduce global emissions in 2030 by 5 and 10% respectively.
- To meet Paris goals of 1.5°C and 2°C, these percentages must reach 30% and 45% respectively.
- If all the unconditional NDCs and other additional net zero commitments by countries are fulfilled, there is a chance of limiting the warming to 1.8°C.

  The Paris Agreement goal is to limit global warming to well below 2 °C, preferably to 1.5 °C compared to pre-industrial levels.

- The report found that in India and six other top emitters, emissions have rebounded and increased after the pandemic.
- But India remains far below the world average at 2.4 tCO_2e.
- The top 7 emitters plus international transport accounted for 55% of global GHG emissions in 2020.

The top seven emitters are China, the EU27, India, Indonesia, Brazil, the Russian Federation and the United States of America.

United Nations Environment Programme

- United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda.
- UNEP is headquartered in Nairobi, Kenya
- It works on 7 broad thematic areas - Climate change, Disasters and conflicts, Ecosystem management, Environmental governance, Chemicals and waste, Resource efficiency, and Environment under review
- The UNEP depend on voluntary contributions for 95% of their income.

References

1. Indian Express – Emissions in India and 6 other nations top pre-covid levels
2. Down-to-earth – Emissions Gap Report 2022 – Pledges to cut greenhouse gas emissions way off track
3. UNEP – Press Release – Inadequate progress climate action makes rapid transformation

World Energy Outlook 2022

The International Energy Agency (IEA) released its World Energy Outlook (WEO) 2022 report, which stated that global emissions will peak in 2025.

- World Energy Outlook is the flagship publication of the International Energy Agency has appeared every year since 1998.
- WEO 2022 report believes global emissions will peak in 2025 as surging energy prices due the Russian invasion of Ukraine propel investment in renewables.

Key Findings

- Russia’s invasion of Ukraine has led to a period of extraordinary turbulence in energy markets, especially for natural gas.
- High energy prices are causing a huge transfer of wealth from consumers to producers, especially in natural gas.
- It forecasts global clean energy investment to rise by more than 50% from today's levels by 2030.
- Global CO2 emissions are then set to fall back slowly from a high point of 37 billion tonnes per year to 32 billion tonnes by 2050.
- Coal demand peaks in the next few years, natural gas demand reaches a plateau by the end of the decade, and oil demand reaches a high point in the mid-2030s before falling slightly
- The world has not been investing enough in energy let the energy system much more vulnerable to the shocks seen in 2022.

India promised to reduce the emissions intensity of its GDP by 45% from 2005 levels by the year 2030, as part of its updated NDC.

International Energy Agency

- International Energy Agency **(**IEA) is a Paris-based autonomous intergovernmental organization established in the framework of the Organisation for Economic Co-operation and Development (OECD).
- Only OECD member states can become members of the IEA and India is an associate member of IEA.
- The IEA acts as a policy adviser to its member states, but also works with non-member countries, especially China, India, and Russia.

References

1. The Hindu - International Energy Agency sees global emissions peaking in 2025
2. New Indian Express - Global emissions will peak in 2025, says International Energy Agency
3. IEA - World Energy Outlook 2022

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