



# **SNS COLLEGE OF TECHNOLOGY**

**Coimbatore-35**  
**An Autonomous Institution**



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

## **DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

### **19ECT301- COMMUNICATION NETWORKS**

III YEAR/<sub>1</sub>V SEMESTER

#### **UNIT V MULTILAYERING NETWORK**

#### **TOPIC 4–GREEN COMMUNICATION NETWORK**



## OVERVIEW

- Green is the design , Green communications and networking in this context means sustainable, energy-efficient, energy-aware, and environmentally aware communications and networking.
- Energy sustainable communications, sensing and edge computing for 6G and beyond;
- Green AI and machine learning;
- Green wireline, optical, and wireless communications and networks;



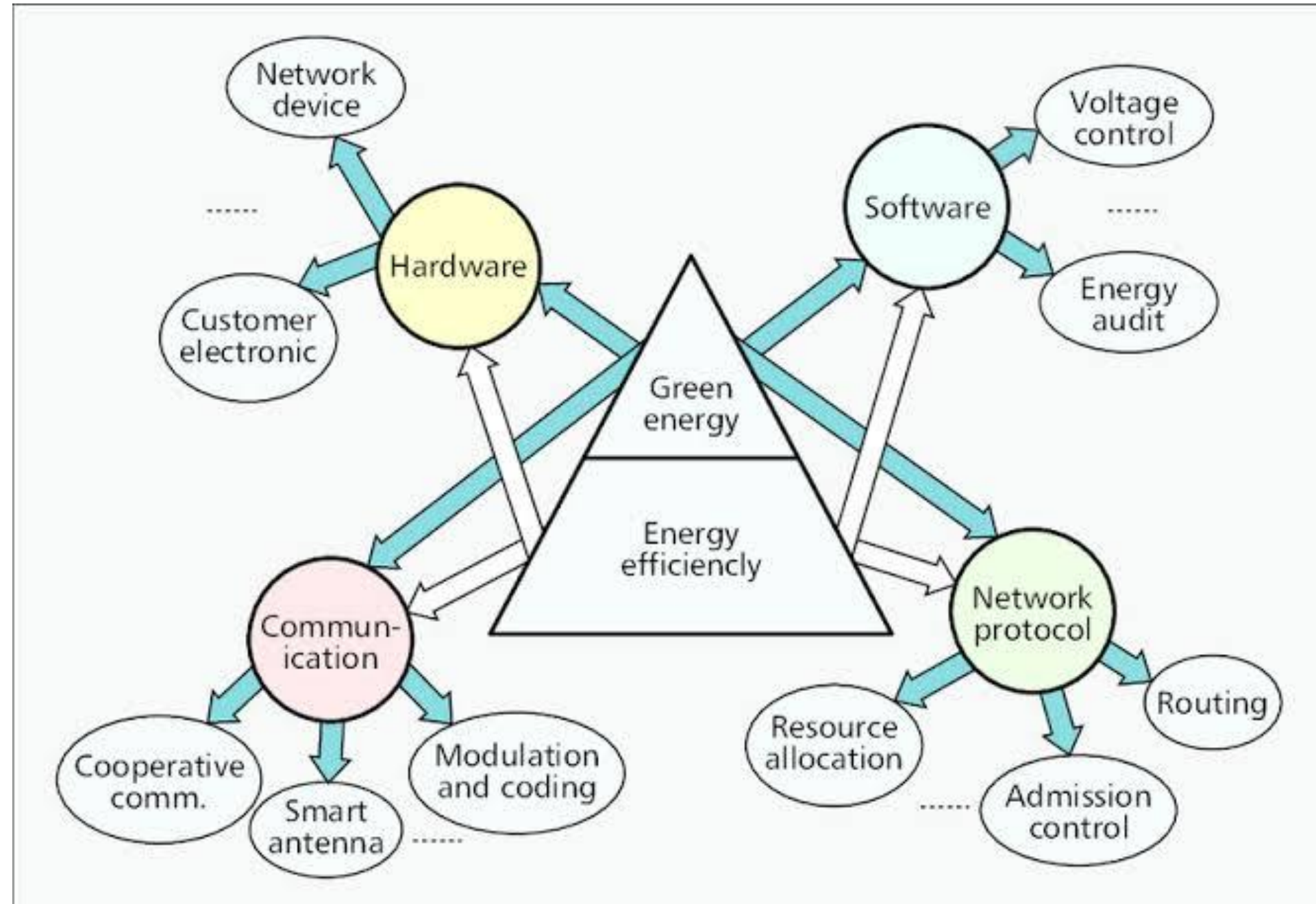
## NEED FOR GREEN COMMUNICATION



- Green communication has emerged as one of the most important research topics for radio systems.
- This leads us to develop an energy-efficient mechanism which adjusts transmission power according to the traffic load and reduces the energy per bit usage.
- For the vision of Europe 2020 as a smart, sustainable and inclusive economy to become reality, the EU have set forth the 20:20:20 targets by which greenhouse gas emissions and energy reduction of primary use should be reduced by 20% while 20% of energy consumption should come from renewable resources.



# GREEN COMMUNICATION NETWORK





## GREEN COMMUNICATION IN. 5G



- The term Green Communication is incorporated for energy harvesting of the network, to produce the minimum amount of CO<sub>2</sub> in the atmosphere. The small cell network (SCN) is the approach to enable the 5G network as green network
- The energy consumption is very challenging task for the design the new generation network.
- As the traffic demand is increasing every second, the power source of the network should be able to handle the traffic load



# THE GREEN CONCEPT



## UGP's Definition\*:

Green is the design, commercialization, and use of processes & products that are feasible & economical while:

- Reducing the generation of pollution at the source.
- Minimizing the risk to human health & the environment.

The field of "green technology" encompasses a continuously evolving group of methods and materials, from techniques for generating energy to non-toxic cleaning products.



## GREEN COMMUNICATION IN 4G



- Green Communication for 4G Wireless Systems mainly covers energy efficient techniques in physical, MAC and network layers. Cross-layer energy efficiency optimization in time and frequency has been also discussed with two fundamental tradeoffs, energy efficiency and spectral efficiency.

This technical introduction to Green Communication in 4G wireless systems, explaining the rather complex standards (3GPP Releases R10 and R11), is a must-read for engineers, decision-makers and students interested in Green Communication, as well as other researchers and scientists from this evolving field.



## ADVANTAGES OF GREEN COMMUNICATION



- Telecommunications and networking – including high-speed mobile, copper and fibre internet access – have become utilities in their own right.
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- So, just as we all become increasingly aware of the carbon footprint of electricity from non-renewable and renewable energy sources, water resource efficiency and the implications of burning natural gas, Green Communication is a parallel trend that governs the way we keep in contact.
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- In particular, Green Communication is enabling entirely new ways to work, communicate and collaborate, allowing companies to do more and improve efficiency, without an associated increase in carbon emissions, greenhouse gases and energy consumption.





# GREEN COMMUNICATION TECHNOLOGIES



- Beyond voice and video calls, green networking technologies are improving energy efficiency in other ways.
- Company intranets provide a digital ecosystem for file sharing and collaborative editing, while reducing the demand for local on-site data centre storage space.
- Server virtualisation means fewer physical machines can run more applications on virtual servers, while deduplication removes redundant copies of files for even more efficient storage.



# FUTURE OF GREEN COMMUNICATION



- As we look to the future, Green Communication is a transformative trend with the potential to positively disrupt working practices, save energy and greenhouse gas emissions, but also improve efficiency and productivity.
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- This is all supported by increasingly green infrastructure, such as telecommunications masts built on previously brownfield sites and powered by their own renewable energy supply such as solar panels or a dedicated wind turbine.
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- At hebs Group we are working hard to drive this technology forwards, installing the infrastructure that will deliver 5G and beyond, while keeping a careful eye on the environmental impact of telecommunications infrastructure to ensure it delivers the best possible benefits for future generations.



**THANK YOU**