



SNS COLLEGE OF ENGINEERING



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Approved by AICTE, Recognized by UGC & Affiliated to Anna University,
Chennai

Department of Electronics and Communication Engineering
**19OE625 - SUSTAINABLE ENERGY SYSTEMS AND
TECHNOLOGIES**

PV System Applications



PV System Applications

Photovoltaic (PV) systems harness the power of the sun to generate electricity. They are increasingly used in various applications, from residential homes to large-scale power plants.



Residential PV Systems

Residential PV systems are designed for single-family homes and apartments. They typically use rooftop-mounted panels and provide clean energy for the household.

Energy Independence

Reduce reliance on the grid and lower energy bills.

Environmental Benefits

Reduce carbon footprint and promote sustainability.

Increased Property Value

Homes with solar panels are more attractive to buyers.

Government Incentives

Tax credits and rebates encourage adoption of PV systems.



Commercial and Industrial PV Systems

These systems are designed for businesses, factories, and other commercial and industrial facilities, providing clean energy for their operations.

Reduced Electricity Costs

Lower operational expenses and improve profitability.

Enhanced Energy Efficiency

Optimize energy consumption and reduce reliance on the grid.

Improved Corporate Image

Demonstrate environmental responsibility and sustainability.



Utility-Scale PV Power Plants

These plants are large-scale installations that generate electricity for entire communities, providing a significant source of renewable energy.

1 Renewable Energy Source

Generate clean electricity without producing greenhouse gases.

2 Grid Stability

Provide reliable and consistent energy to the grid.

3 Economic Benefits

Create jobs and stimulate local economies.

4 Land Use Considerations

Require significant land area, impacting wildlife and ecosystems.



Off-Grid PV Systems

These systems are used in remote locations without access to the grid, providing independent power supply for homes, businesses, and other off-grid applications.

1

Solar Panel Array

Captures sunlight and converts it into electricity.

2

Battery Storage

Stores excess energy for use during nighttime or cloudy days.

3

Inverter

Converts DC power from the solar panels to AC power for household appliances.



PV Systems for Agriculture

Solar power can be used for various applications in agriculture, such as powering irrigation systems, greenhouses, and other farm equipment.

1

Water Pumping

Power efficient irrigation systems, reducing water waste.

2

Greenhouse Heating

Provide controlled environment for growing crops year-round.

3

Livestock Management

Power lighting, ventilation, and other equipment for animal care.



PV Systems for Transportation

Solar energy is playing an increasingly important role in powering electric vehicles and supporting charging infrastructure.

Application	Benefits
Electric Vehicle Charging	Reduce reliance on fossil fuels and lower emissions.
Public Transportation	Power buses, trains, and other mass transit systems.



Emerging PV Applications and Future Trends

PV technology is constantly evolving, with new applications emerging and future trends promising even greater potential for solar energy.



Building-Integrated PV

Solar panels integrated into building materials for seamless energy generation.



Space-Based Solar Power

Harnessing solar energy in space and transmitting it to Earth.



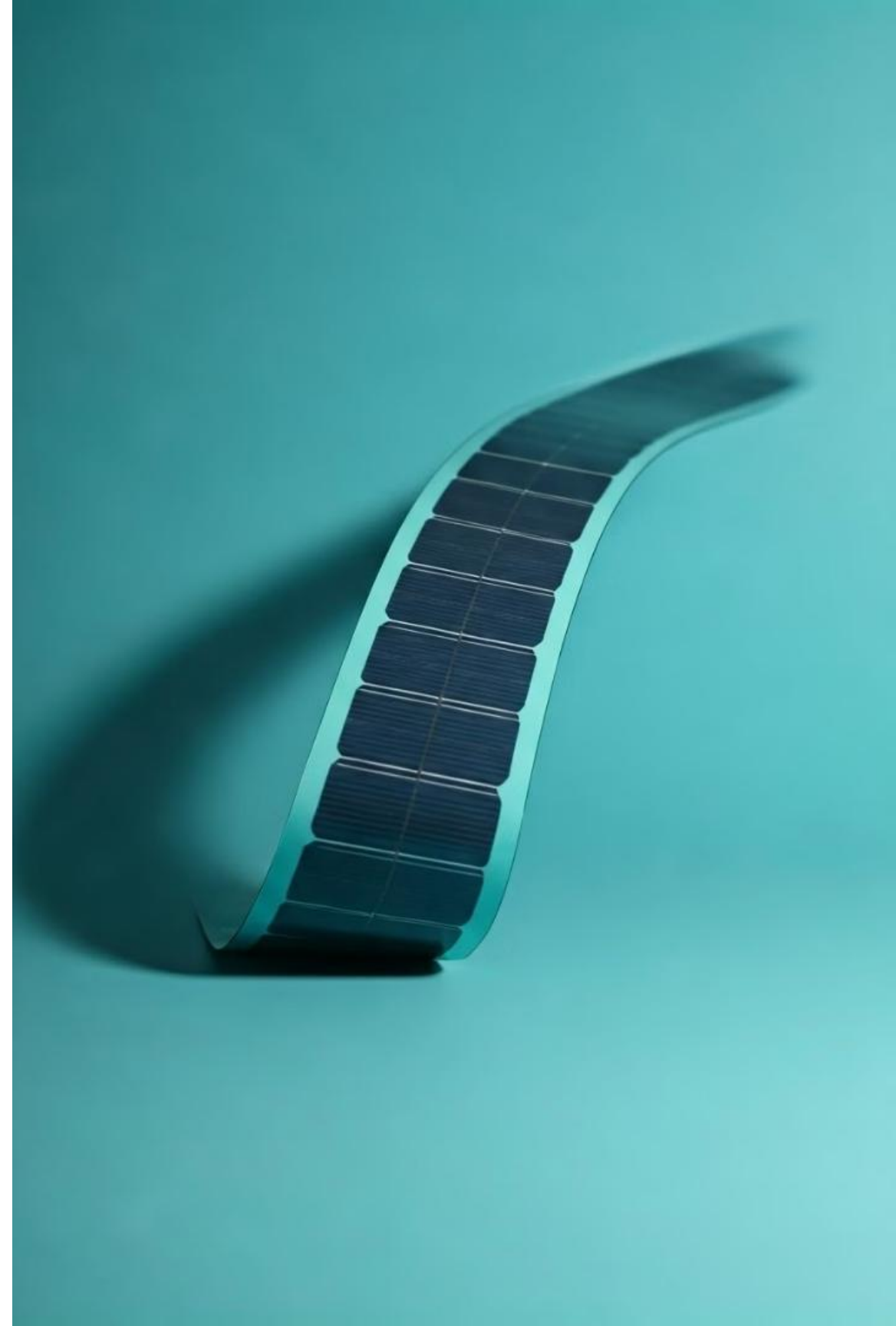
Increased Efficiency

Continuous advancements in solar cell technology for higher energy conversion rates.



Smart Grid Integration

Integrating PV systems with intelligent grids for optimized energy management.



THANK YOU