SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

UNIT-III- Captive power plants

Captive power plants

Captive power plants refer to power generation units that are set up by industries or businesses primarily for their own consumption. These plants are called "captive" because they do not supply power to the wider electricity grid; instead, they are dedicated to providing electricity for the specific industrial facility or company that operates them.

Here are a few key points about captive power plants:

Independence from the Grid: Captive power plants offer industries and businesses independence from the fluctuations in the public electricity grid. This can be crucial for operations that require a continuous and stable power supply, such as manufacturing plants or data centers.

Customization: Captive power plants can be customized to meet the specific needs of the industry they serve. The capacity, type of fuel used (such as diesel, natural gas, or renewable sources like solar or biomass), and the technology employed can all be tailored according to the requirements of the business.

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Cost Efficiency: In certain situations, setting up a captive power plant can be more cost-effective than relying solely on the grid, especially if the industry can leverage economies of scale or if there are tax incentives and subsidies for generating power from renewable sources.

Energy Security: Captive power plants provide energy security to industries, ensuring a stable power supply even during grid failures or shortages. This can be vital for industries where interruptions in power supply can lead to significant financial losses.

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Environmental Considerations: Depending on the type of fuel used, captive power plants can have varying environmental impacts. While traditional fossil fuel-based captive power plants can contribute to pollution and greenhouse gas emissions, those powered by renewable sources offer a more environmentally friendly alternative.

Regulations and Compliance: The setup and operation of captive power plants are subject to regulations and compliance standards set by the local authorities. Businesses need to adhere to these regulations to ensure the legal operation of their captive power facilities.

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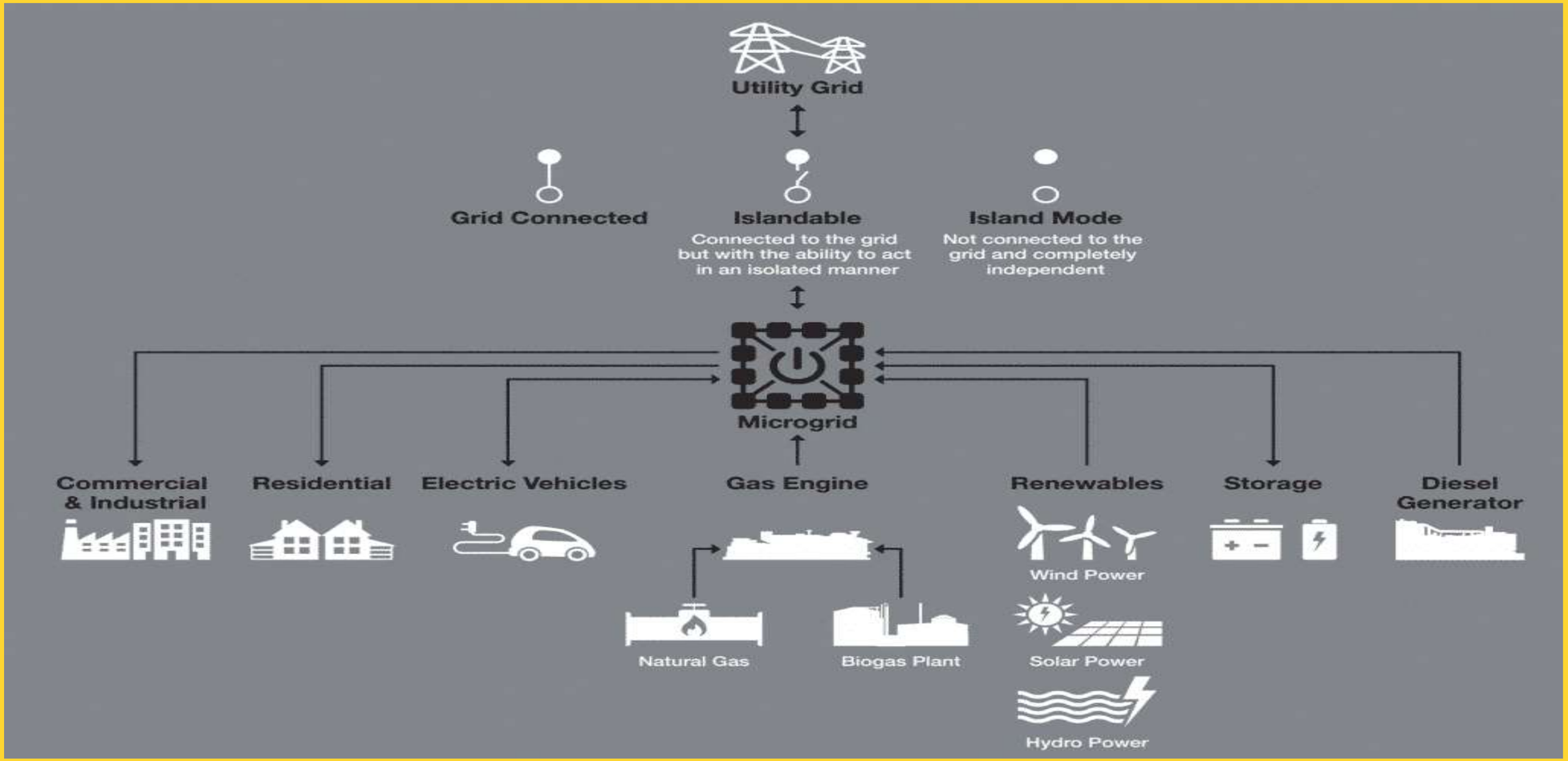
captive power plant is a facility that provides a localised source of power to an energy user. These are typically industrial facilities, large offices or data centres. The plants may operate in grid parallel mode with the ability to export surplus power to the local electricity distribution network. Alternatively they may have the ability to operate in island mode; i.e. independently of the local electricity distribution system. Captive power plants are a form of distributed generation, generating power close to the source of use. Distributed generation facilitates the high fuel efficiency along with minimising losses associated with the transmission of electricity from centralised power plants. Gas engines can be combined with other power generation or storage technologies in microgrids.

Gas engines make ideal captive power plants where there is a localised supply of gas. This might be from a gas pipeline but can also be transported via vehicle as compressed or liquefied natural gas or biomethane.

Gas-fuelled captive power plants are most fuel efficient when used in a combined heat and power (CHP) configuration. Here a facility can generate not only electricity, but also heat which can be off set.

Combined heat and power



Benefits of captive power plants

- Security of power supply and resilience through self-generation
- Reduced costs through high fuel efficiency, particularly when in CHP configuration
- Improved environmental performance resulting from fuel efficiency

THANK YOU