7.2.1 – Describe at least two institutional best practices:

Best Practice 1:

1. Title of the Topic-Solar Panel Energy for parking

2. Objectives / intended outcome/ principle outcome

It eliminates electric bills: This is very important objective of installing any new facility to be implemented in the campus for parking. This solar panel shade structure, with its energy there is direct reduction in electricity consumption. Hence, it saves money.

Protects/Shades vehicles: The solar panels, while absorbing the sun prevents it from beating down on cars all day as the UV rays can damage and affect car surfaces. And if vehicles are parked in shady areas, then, it saves fuel also as it saves vehicles from getting heated in open sun rays.

Low maintenance and long life: As Solar power energy is a natural resource; it is much more reliable and less expensive than fuels or any other resources. Once a solar panel system is installed, it requires little maintenance, especially if there are no batteries being used.

3. Context

The Solar canopies are getting popular these says because of their increasingly benefits in parking and invest solar power. Parking under solar canopy installation is an excellent installation option for institutions, buildings, malls, and hospitals with large parking space. It not only generates green power, but also beneficial for employees and stakeholders to protect their vehicles parked in shady space like solar power energy. A wide range of installation options make parking lot solar canopies a strong aesthetic choice for maximum benefit. The structure and design made makes it easy to maintain and maximizes power generation potential. With solar parking structures, business can provide numerous benefits to everyone who parks on such premises as it reduces the fuel consumption as well. For customers and employees, a solar canopy provides shade and coolness for their parked vehicles, which can translate into reduced AC and fuel consumption. For businesses, the energy generated by the solar canopies often results in drastically reduced energy bills.

4. The Practice

The CleanMaxx believes in making a change which benefits to customers, colleagues, partners, investors and all whose lives the company gets into contact with. This company makes a positive difference to the environment and society at large. And this is done by providing exceptional products and services that meet the specific needs of the users.

Founded in 2008 in India, CleanMaxx a brand owned by Illusions4real is headquartered in Jaipur, Rajasthan. Besides serving as a leading manufacturer of solar PV modules and Solar Thermal solutions, CleanMaxx also offers small solar powered products for everyday use. The Manipal University continued its journey of adopting solar energy and partnered with CleanMax to install rooftop solar plant at their Jaipur Campus. The plant was commissioned in March 2015 and has a capacity of 800 kWp. The solar plant fulfilled the expectation of abating 113 tons of CO2 annually. Overall, the plant has generated roughly 12 lac units per year, supplying power to the whole campus. Besides the campus at Rajasthan, CleanMax has also installed rooftop systems at other campuses in Bangalore (135 kWp), Mangalore (978 kWp), and Udupi (215 kWp). Under the BOO model, the incentives for Manipal University are threefold – (i) Capex free – without any investment, (ii) Hassle free-turnkey solutions with 25 years of maintenance support and (iii) Risk-free – it is CleanMax ownership as a developer to ensure optimum plant performance.

5. Limitations:

- Cost effectiveness: With all such benefits there is always limitations as well. Such installations are expensive. So it is not bearable for everyone.
- Sun rays/ Weather dependency: Since such Solar energy system is functional on Sun rays only, then such mechanism is operational only in clean or normal weather.
- Enough space is needed: Such installation is demanded of enough space only then the maximum benefit can be obtained.
- Techno friendly: dealing with such technical mechanism, a regular servicing and observation is also needed to make the service smoothly functional.

Best Practice-2:

1. Title of the Topic- Waste Water Recycling Plant

2. Objectives / intended outcome/ principal outcomes

- It can remove 97% of suspended solids.
- It is biological nitrification without adding chemicals.
- Enhances oxidation and nitration achieved.
- Biological phosphorous removal.
- it is helpful in solids and liquids separation.
- it removes organics.
- Easy in cost effectiveness.
- Easily maintained mechanical work.

3. Context:

The Water scarcity, increasing costs of water & it's treatment, and the environmental norms for discharge have made recycle and reuse of wastewater a necessity in today's scenario. The wastewater after treatment through physical, chemical & biological processes can be further treated by tertiary treatment processes. The downstream treatment processes to effluent treatment system further decrease Suspended impurities, BOD (Biological Oxygen Demand), COD (Chemical Oxygen Demand), TOC (Total Organic Carbon) and Dissolved impurities beyond the regulatory discharge norms and make water suitable for various applications. The treated water can be recycled and reused for washing, cooling, horticulture process and numerous other uses.

4. Practice:

The wastewater treatment process facilitates the treatment of existing contaminants in the water or reduces the concentration of such contaminants so that the water becomes fit for the desired use.

The average wastewater generated in the campus is 1837 KLD. The average wastewater treated in the 4 STPs (1850 KLD Plant) is 1670 KLD. The entire treated water is used for toilet flushing, watering gardens, and maintaining lawns in the campus. The sludge settled in the STPs is removed four times a month and is composed and used as manure for the gardens. Thus, the entire

wastewater which is generated in the campus is treated and used. In developing nations including India, unsafe water, poor hygiene practices and inadequate sanitation are not only the causes of the continued high incidence of diarrheal diseases but a significant contributing factor in under-five mortality, according to UNICEF,2016 report. Sanitation refers to the maintenance of hygienic conditions by proper treatment and disposal of human urine and faecal sludge (FS). Improved sanitation is known to have a significant positive impact on health both in households and across communities. Contrary to wastewater management, the development of strategies and treatment options adapted to the conditions prevailing in developing countries to cope with faecal sludges (FS), the by-products of on-site sanitation installations, have long been neglected. One-third of the world population (approximately 2.4 billion urban dwellers) rely on on-site sanitation installations, namely unsewered family and public latrines and toilets, aqua privies, and septic tanks. This situation is likely to last for decades to come, since city-wide severed sanitation is neither affordable nor feasible for most urban areas in developing countries. The specific challenges in treating FS in developing countries, as opposed to treating wastewater, lie in the fact that pathogen concentrations are higher by a factor of 10 to 100 in FS than municipal wastewater and that appropriate, affordable, and enforceable discharge and reuse standards or guidelines pertaining to FS treatment are lacking.

5. Limitations:

- Needs energy to operate (air compressor, turbine)
- Annual maintenance required (which can be binding on some models)
- Can be recommended for holiday homes (secondary houses). SBR systems and those with a sludge return process can be more suitable for holiday homes, depending on the occupancy.