

CLEAN ENERGY POSSIBILITIES **from** **SEWAGE TREATMENT PLANTS** **(STPs)**

13th November, 2018
11.00 am - 12.30 pm
Room No.2&3, BCCK

Naini Jayaseelan
naini_14@yahoo.co.in

SEWAGE TREATMENT PLANTS (STPs)

- **STPs are generators of methane**, a potent non-CO₂ Green House Gas (GHG), released from the breakdown of organic wastes in sewage.
- Methane contributes more than 20% to the annual increase in global warming by all GHGs.
- If allowed to leak into the atmosphere before being used, **methane effectively traps the sun's heat and contributes to global warming trapping 20 times more heat than CO₂.**

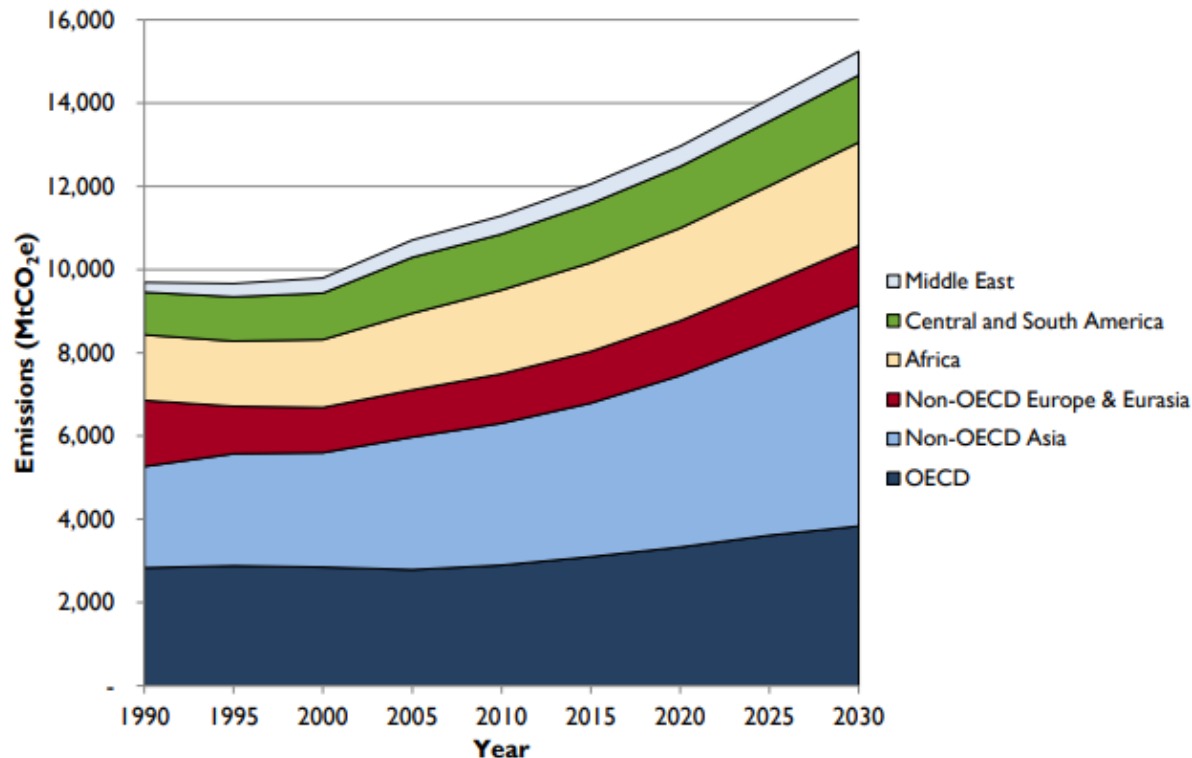
SEWAGE TREATMENT PLANTS (STPs)

- Methane not only has a direct influence on climate but also has a number of indirect effects including its role as a precursor to the formation of tropospheric ozone (an air pollutant).
- If methane is captured from anaerobic digestion in STPs, the energy cost of running STPs (both for aeration and pumping) would reduce by 20-30%.
- In addition cooking gas can be supplied to at least 200 households in the vicinity.

Methane Emissions

- Asia is the largest contributor of global methane emissions and the trajectory for Asia is **nowhere near slowing down**.

Exhibit 4: Total Global non-CO₂ Emissions, by Country Grouping (MtCO₂e)



Source: EPA Report - Global Anthropogenic Non-CO₂ Greenhouse Gas Emissions: 1990 - 2030

SEWAGE TREATMENT PLANTS (STPs)

- In India, dependence on fossil fuels would be greatly reduced, if a 20% reduction in cost of energy for running STPs is achieved.
- In Delhi, for instance, the monthly energy cost of running 20 STPs is as high as US\$1 million.
- Assuming even a 20% reduction in the energy cost would ensure a saving of US\$0.20 million per month which on an annual basis would be approximately US\$2.4 million.
- If Methane is captured from the STPs, dependence on coal-fired thermal plants would reduce, leading to lesser air pollution and lesser fly ash (a major source of air pollution in Metros).

Hurdles in capturing methane from STPs

Issue	Description
Legacy Issues:	The useless by-product was flared.
Technological and Legal Issues:	<ul style="list-style-type: none"><li data-bbox="498 389 1846 596">• Most sewage treatment technologies have been guided by effluent parameters prescribed under the respective country environment laws.<li data-bbox="498 632 1846 989">• Non-biological technologies like Sequential Batch Reactor (SBR) and Moving Bed Bio-film Reactor (MBBR) have been used to meet the Biological Oxygen Demand (BOD) parameters for the treated effluent.<li data-bbox="498 1025 1846 1310">• However, methane recovery takes place in STPs running only on biological processes, like Upflow Anaerobic Sludge Blanket (UASB) and Activated Sludge Process (ASP).

Hurdles in capturing methane from STPs

Issue	Description
Technological and Legal Issues: ...contd...	<ul style="list-style-type: none"><li data-bbox="479 325 1846 915">• Environmental laws in South Asian countries do not specify that the treatment technology should be self-sufficient in terms of energy use. This is essential for the treatment process to be sustainable and to reduce dependency on fossil fuels.<li data-bbox="479 962 1846 1290">• This can happen only if methane is looked upon as a resource and is not allowed to leak into the atmosphere as a Short-Lived Climate Pollutants (SLCP)

Retrofitting STPs

- South Asian cities have enormous potential to be innovation centres to deliver cost-effective solutions for methane mitigation.
- **Re-designing and retrofitting STPs with bio-digesters for anaerobic digestion** makes the case for methane recovery from STPs far more compelling both for climate change and public health.
- If Methane is captured both from STPs and Landfills, the power cost of running STPs would be reduced at least by 30%.