GUJARAT INTERNATIONAL FINANCE TEC-CITY

OVERVIEW OF SMART CITY - GIFT

Mar 06th,2020

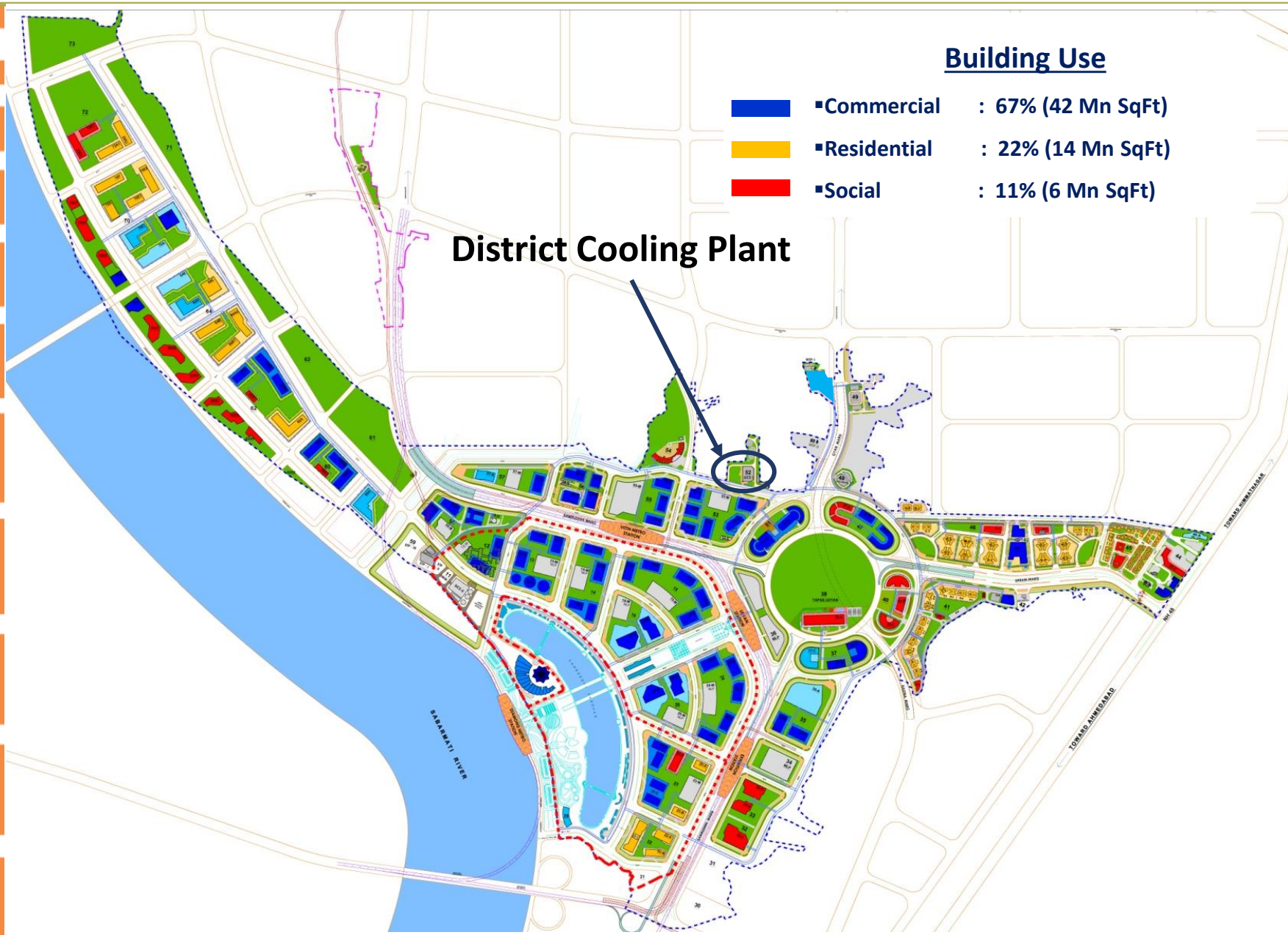
PRIME MINISTER'S VISION

Shri Narendra Modi
Prime Minister of India

"The vision of Gujarat would be incomplete without capitalising on the in-house financial business acumen.

To tie-up with technology, to create a hub complete with infrastructure, to meet the needs of modern Gujarat, modern India and to create a space in the global financial world…that is my dream"

MASTER PLANNING OF GIFT CITY



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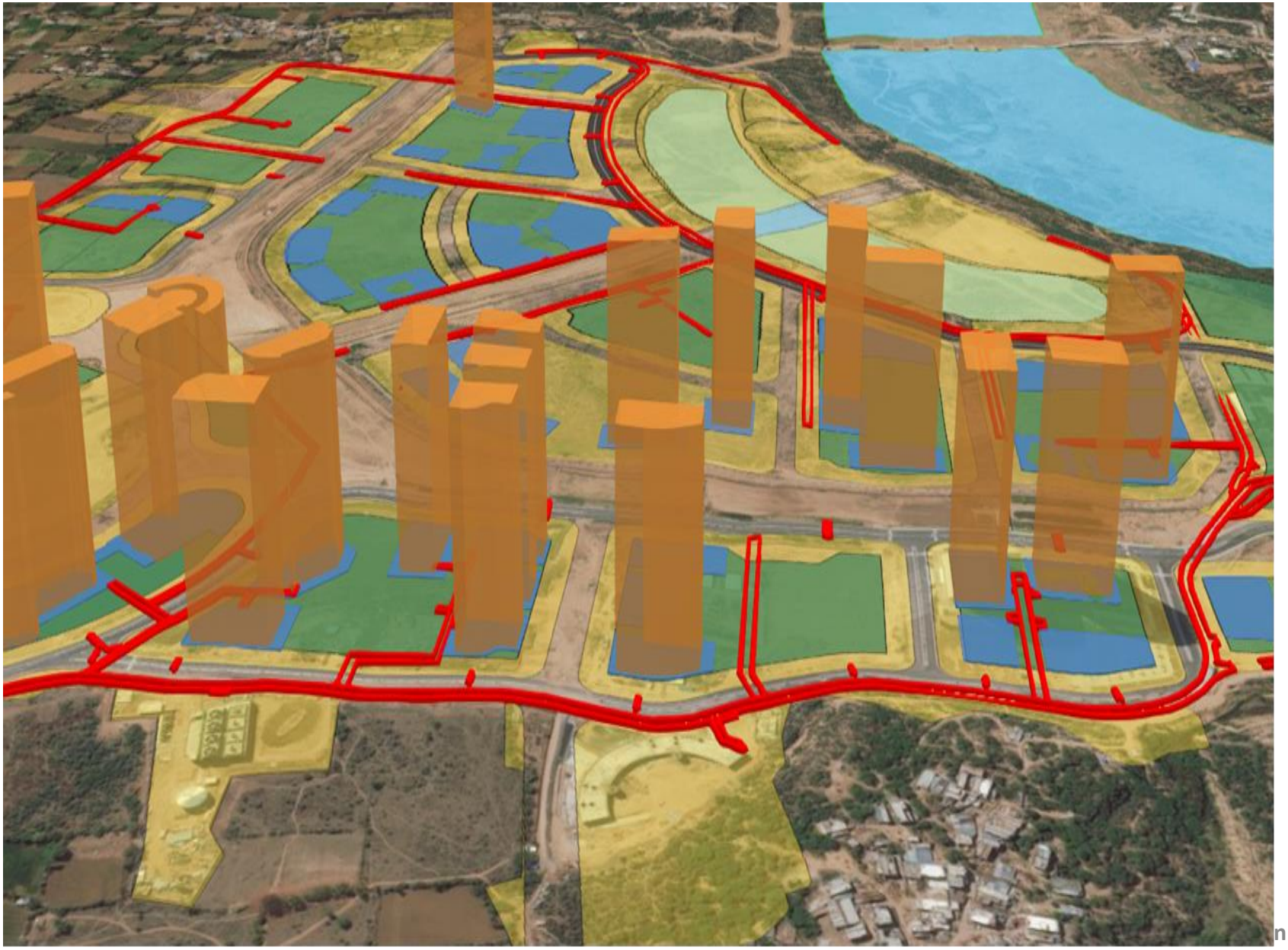
GIFT CITY ARIAL VIEW

GIFT CITY PLANNING



DES OVERVIEW

- **District Energy System** (DES) is a single largest consumer in any facility or upcoming City for comfort application.
- It is going to become a trend to establish DES for medium and large establishment soon as the awareness spreads
- Currently people and developer are not too enthusiastic about intangible benefits such as:
  - ❖ Heat island effect
  - ❖ Reduction in carbon foot-print
  - ❖ Better overall efficiency of DES due larger diversity
  - ❖ Economy of scale
  - ❖ Water conservation
  - ❖ Reduced impact of refrigerant in environment (GWP & ODP)

DES CHARACTERISTIC

- Low Water delivery temperature at 5 Deg C and 9 Deg C - delta reduces pumping and piping cost
- Low cost of production due to ‘Economy of Scale’ and low Capex due to higher Diversity
- Thermal Energy Storage system caters thermal load fluctuations
- Night time – Low Electrical Tariff and for Capex Utilization
- SCADA improves Operational Efficiency

DES VIDEO

DISTRICT ENERGY SYSTEM PLANT ROOM

DCS PLANTROOM (10,000 TR @ 11 KV)

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DCS PLANTROOM

THERMAL ENERGY STORAGE (10,000 TR-HR)

UNDER GROUND UTILITY TUNNEL

ELECTRICAL POWER SYSTEM (33 - 11 KV)

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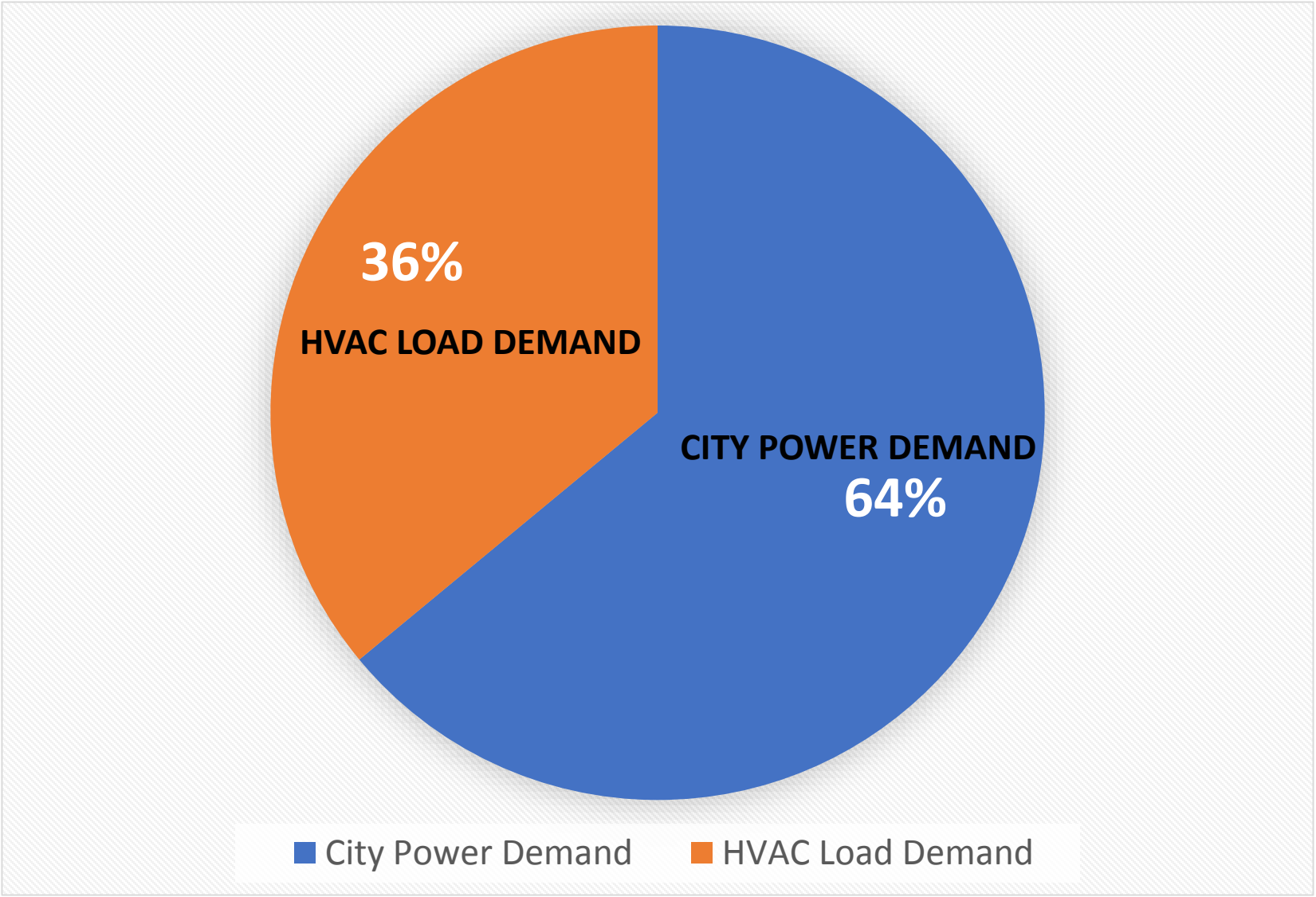
OPTIMIZING ELECTRICITY GRIDS BY DISTRICT ENERGY SYSTEM (DES)

ELECTRICAL DEMAND AND OPTIMIZATION

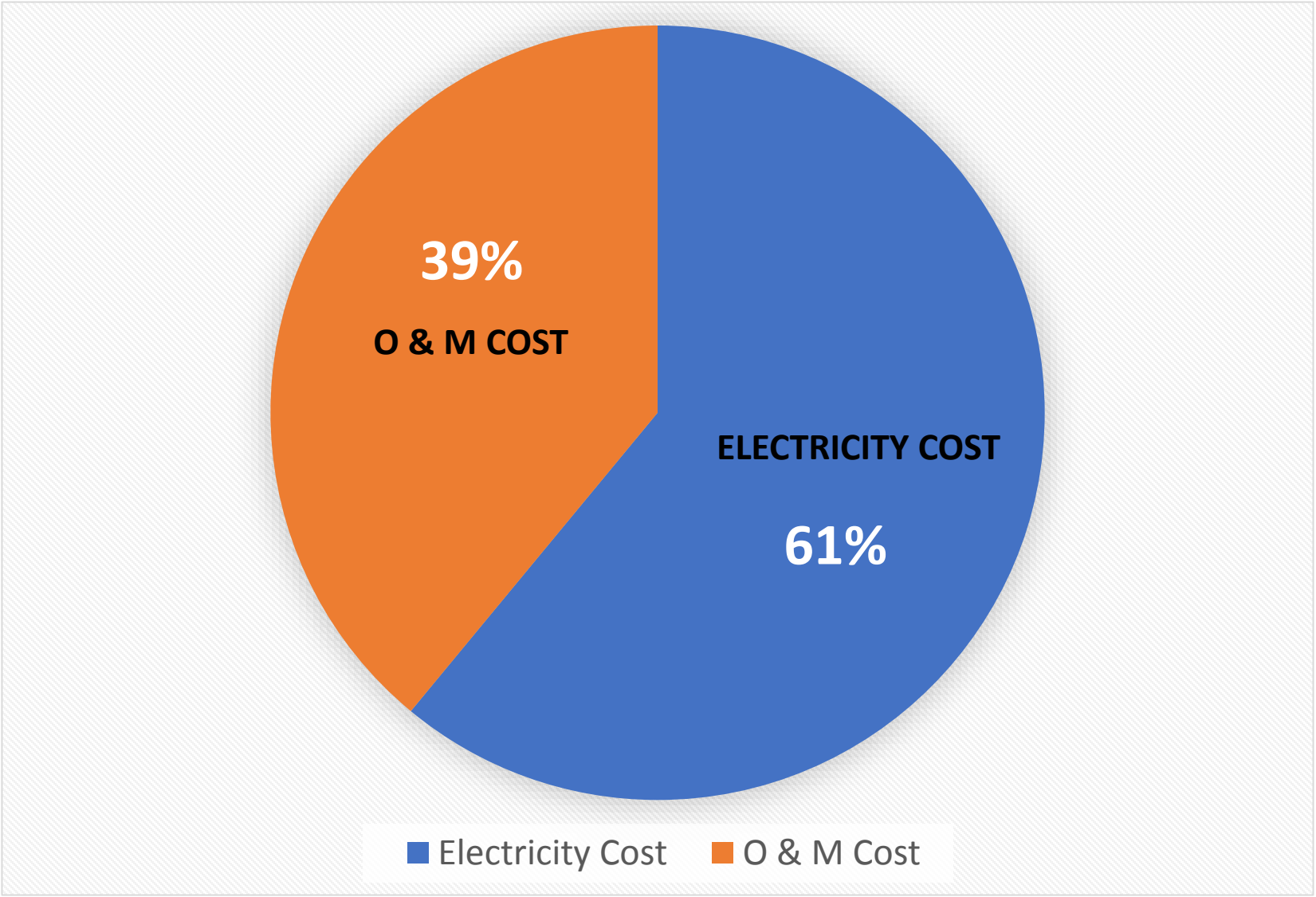
- District Energy System is a major consumer in an upcoming City, consumes approx. 36% of the total electricity of the City.
- HVAC demand rises results in Electricity demand to Peak.
- To cater to the HVAC peak demand – Electrical Peak demand needs to be stabilized. We propose to use Non-conventional energy essentially, Solar Power to help shave the electrical peak. Also store energy when the renewal power generation is surplus. This may also result in smaller size of electrical installation.
- The exiting total electrical demand is 6 MW against which DES demand is 2.2 MW (36%) and this electrical load can be catered with Solar power generation.

POWER DEMAND: HVAC VS CITY LOAD



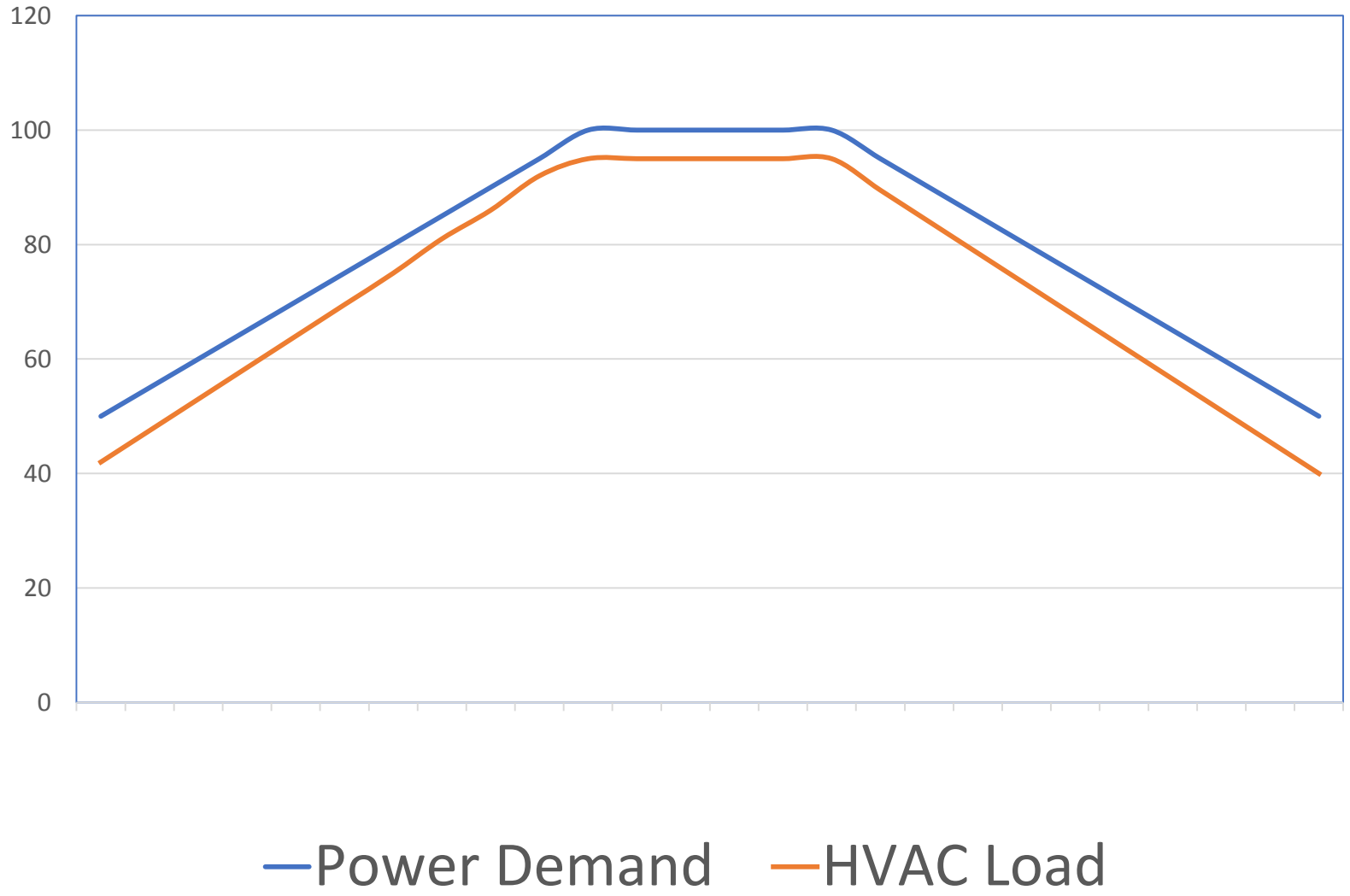
Graphical Representation

ELECTRICAL COST VS TOTAL OPERATING COST



Graphical Representation

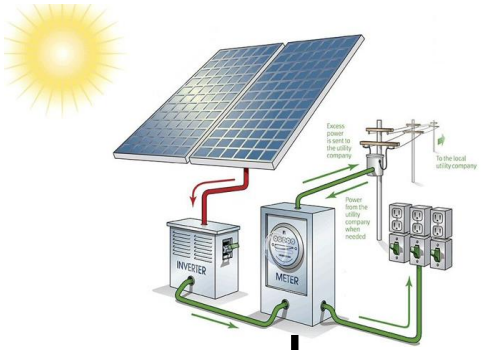
ELECTRICITY & HVAC SIMULTANEOUS PEAK



Graphical Representation

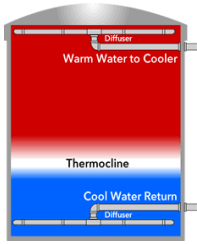
DISTRICT COOLING SYSTEM WITH SOLAR POWER PLANT

Sub-Station



Solar Power Plant

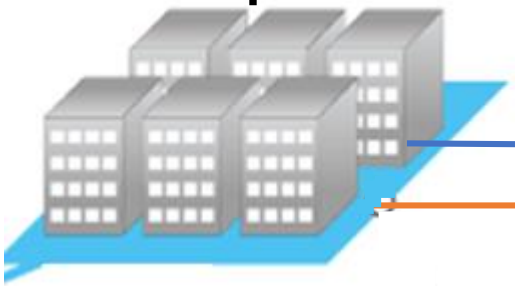
Power Supply



Thermal Energy Storage

Developer Building

Developer Building

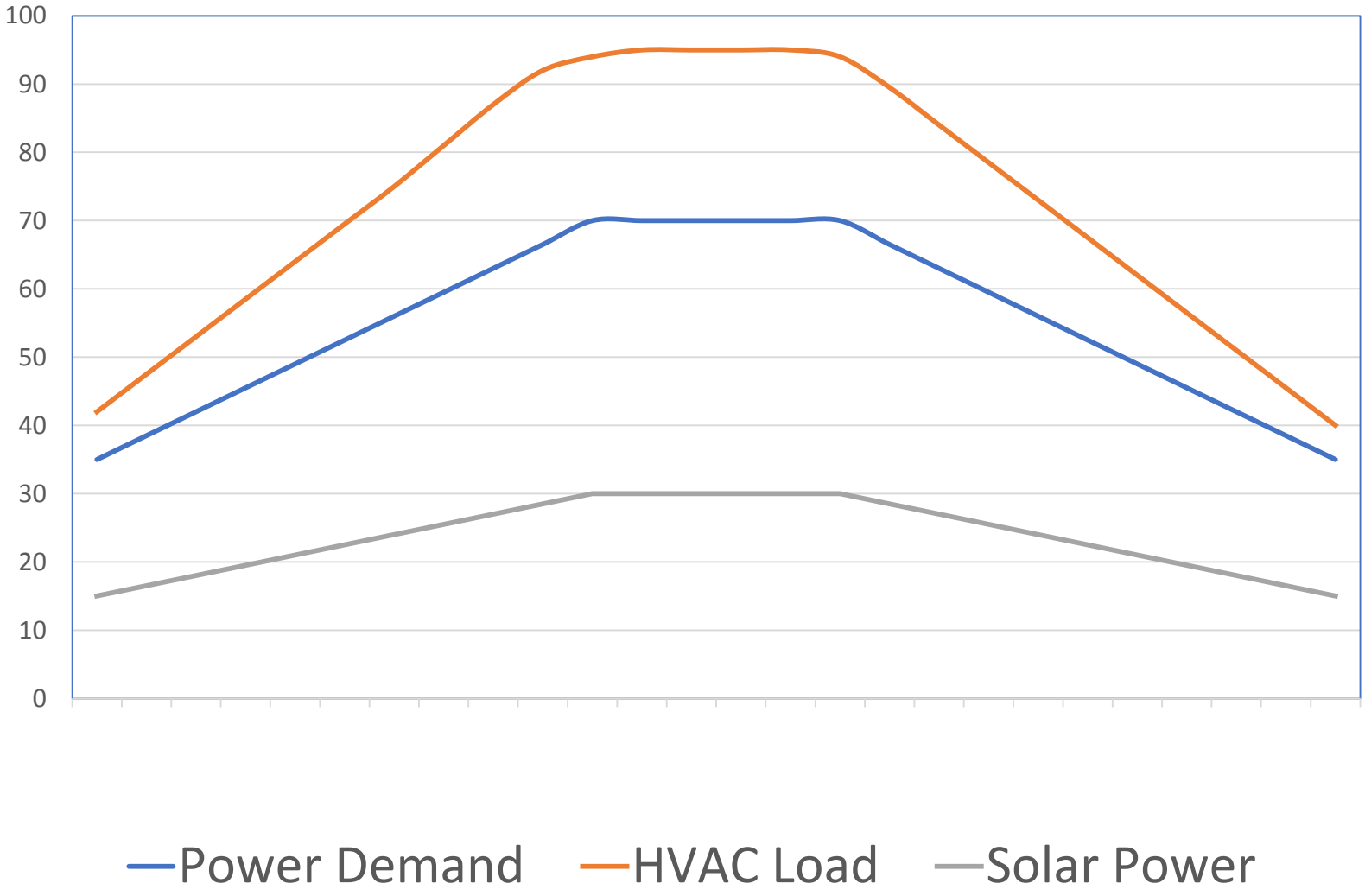


District Cooling Plant

CHWS

CHWR

POWER FROM GRID SUPPORTED BY SOLAR



Graphical Representation Only

OPTIONS : OPTIMIZE ENERGY LOAD

- Improve Efficiency of HVAC Plant (<0.9 kw/tr)
- Reduce raw material cost (Power)
- Increase DCS Tariff

OPTIONS TO REDUCE COST

- Waver on duty and tax component
- Dynamic pricing Model to the advantage of DES operation
- Power Purchase Agreement(PPA)
- Co-generation, Tri-generation
- Non-conventional energy: Solar, Wind and Geo-Thermal
- TES (Thermal storage)

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A CITY FOR THE NEXT GENERATION

THANK YOU

www.giftgujarat.in