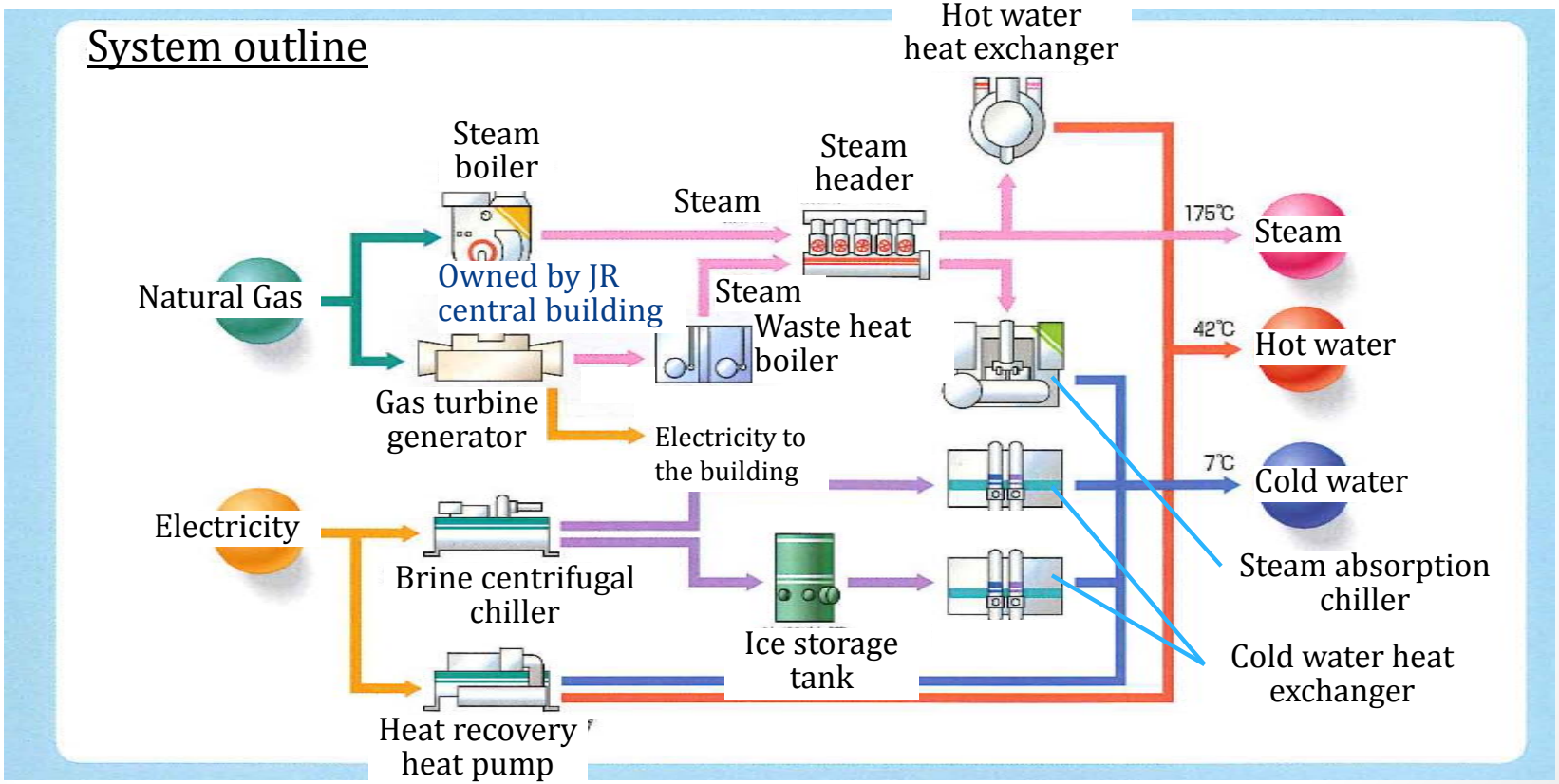
Outline of the JR Central Nagoya Station Area District Heating and Cooling

Company Profile

- Company name : Nagoya Netsukyokyu CO.,LTD
- Establishment : Oct. 7th 1994
- Capital fund : 1.6 billion JPY
- Major Stockholders : Central Japan Railway Company 51.0%
  CHUBU Electric Power Co., Inc 24.5%
  TOHO GAS CO., LTD 24.5%
- Business outline : Supplying Chilled water, Hot water, Steam etc.

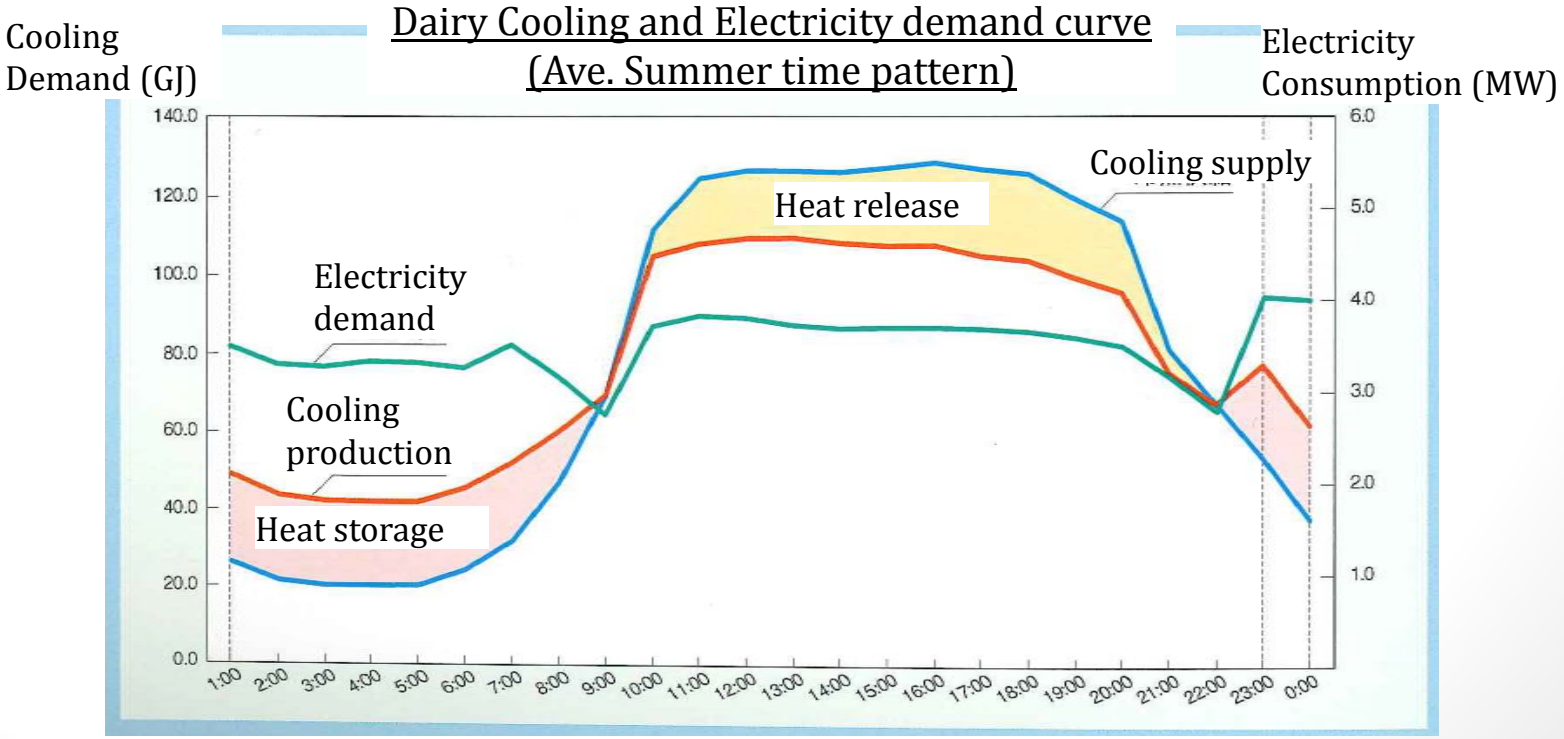
Introduction of the Plant

- This DHC adapts Eco friendly heat supply system which saves energy by combination of “Ice storage system(electricity)” and waste heat from the “Cogeneration system(Natural gas)”.
- Energy management is adopted to enhance energy efficiency by continuous analysis of operational data.



Load curve of the DHC

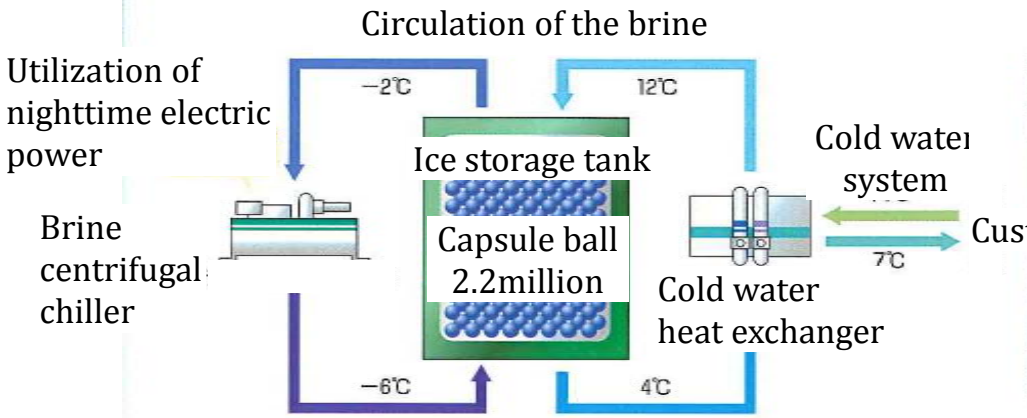
- As cooling demand in the summer time from 11:00 to 18:00 is plateau, by discharging the cold heat stored at the nighttime, the system could reduce the operation hours of the chillers and contribute to energy saving.
- The electricity demand curve (green line) has been resulted to be flat. Its value is around 3 to 4 MW contributing to load leveling and reduction of operational cost.



Peak shaving by Ice storage system

- By producing ice at nighttime utilizing low cost nighttime electricity and using them to produce cold water in the daytime, this Ice Storage System contribute to cost reduction and load leveling.
- The volume of Encapsulated Ice TES tank is 1,226m^3 with 49 MWh (14,000RTh) which is as huge as 50m Olympic swimming pool.

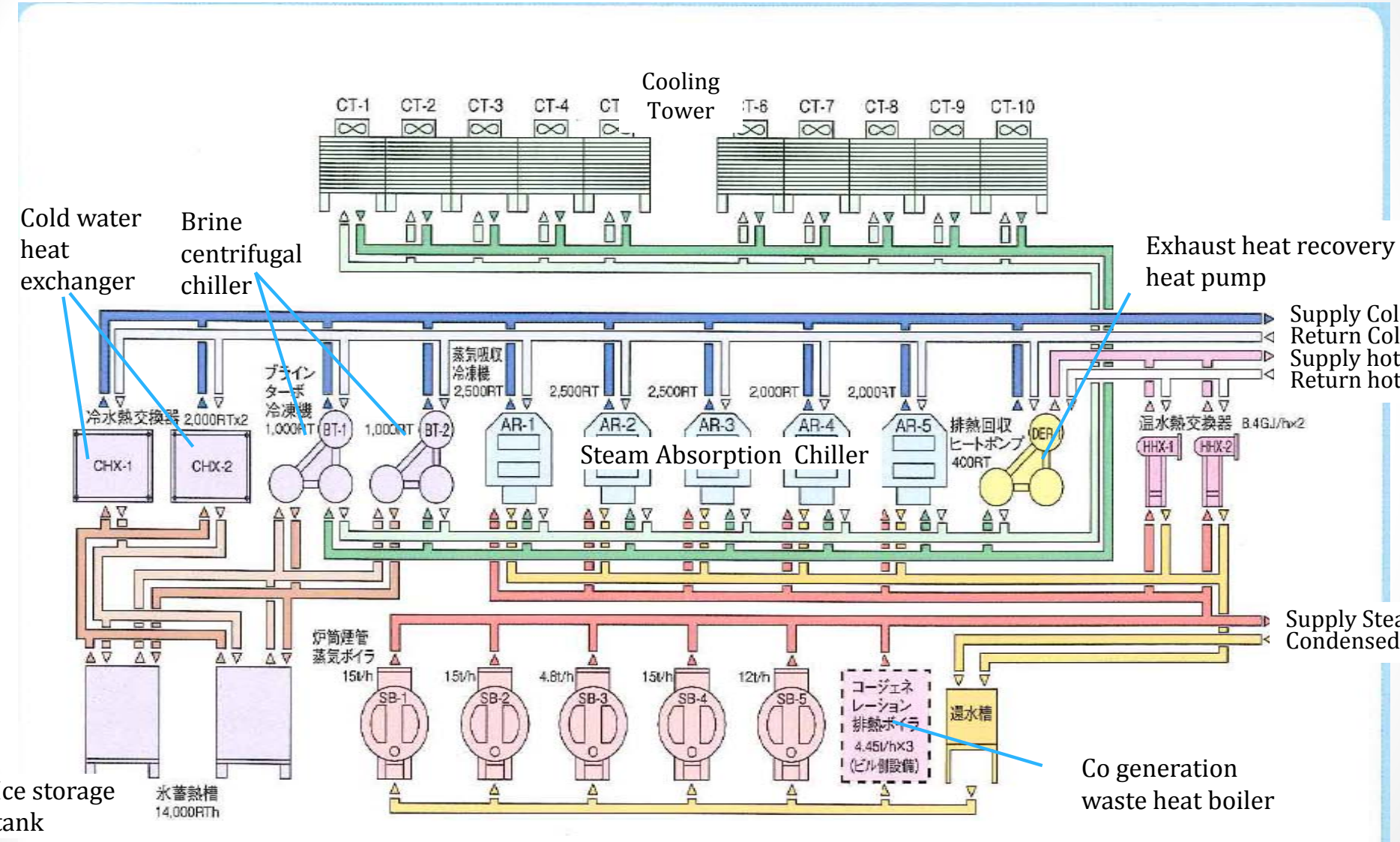
System outline of the ice storage system



Ice storage tank room

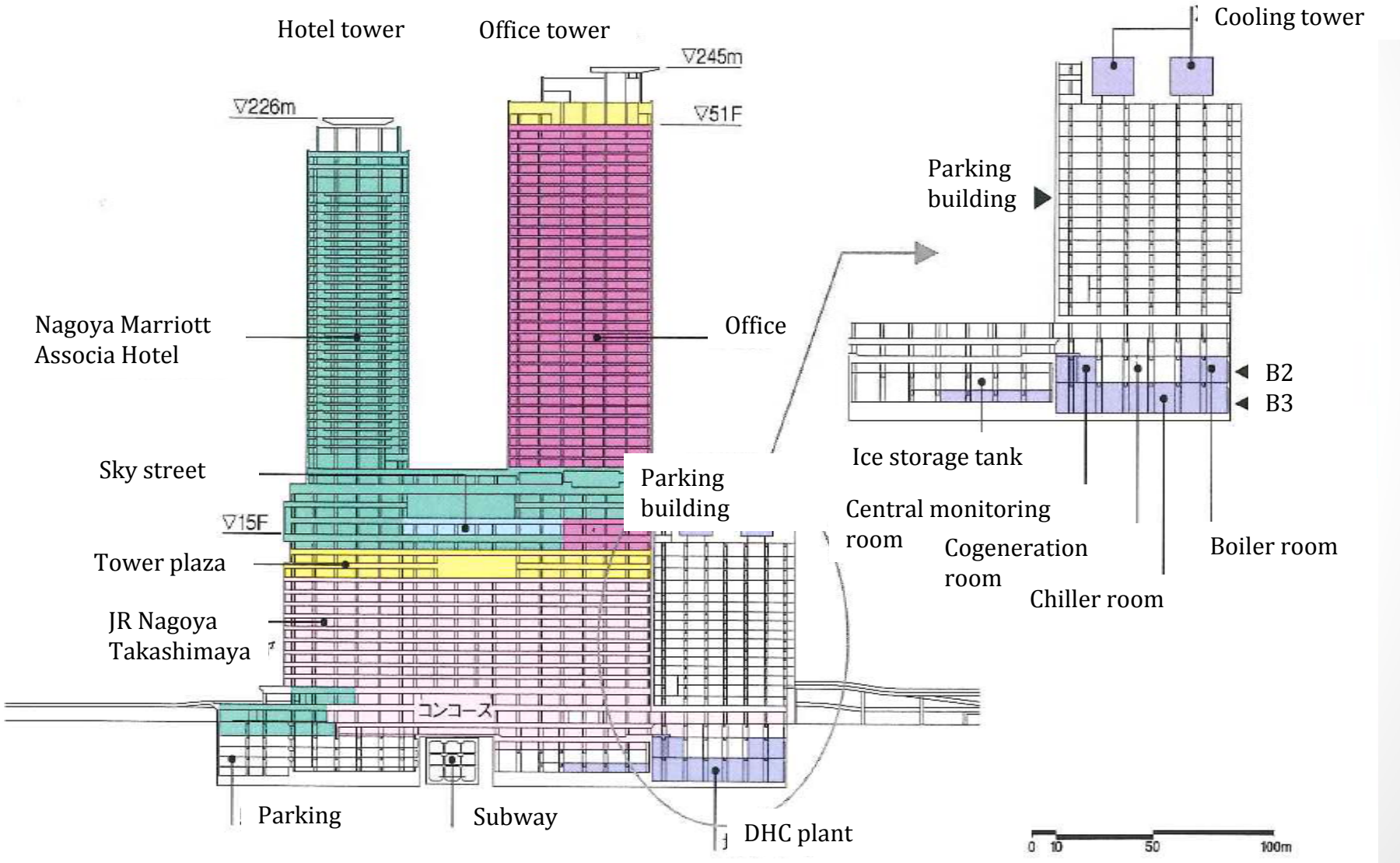
(※)Capsule ball was adapted in order to increase contact area with the brine

System flow of the heat production



(※)In this plant we have adapted the electric and gas combined system. And load leveling has been achieved by ice storage system utilizing nighttime electric power and use of steam absorption chiller. Also waste heat from the cogeneration system (Natural gas) which is installed inside the JR central tower building is used.

Plant location diagram



Plant data

- Equipment list and it's capacity

	Name	Specification	Number
Cooling (Capacity 48,900kW)	Steam absorption chiller	Double effect steam absorption chiller 8,750 kW(2,500RT)	3 units
		Double effect steam absorption chiller 7,000kW (2,000RT)	2 units
	Brine centrifugal chiller	Electric centrifugal chiller 3,500 kW (1,000RT)	2 units
	Exhaust heat recovery heat pump	Cooling 1,400kW(400RT) Heating 1,800kW	1 units
	Ice storage tank	Capacity 1,226m3 : 49 MWh	1 set
	Cold water heat exchanger (Heat release)	Brine-Water heat exchanger 7,000kW(2,000RT)	2 units
	Cooling tower	990m3/(h・unit) (9,200kW/unit)	10 units
Heating (Capacity 40,600kW)	Steam boiler	Flue and smoke tube boiler (Natural gas) low NOx 15.0t/h(9,500kW)	3units
		Flue and smoke tube boiler (Natural gas) low NOx 12.0t/h(7,500kW)	1units
		Flue and smoke tube boiler (Natural gas) low NOx 4.8t/h(3,000kW)	1units
	Hot water heat exchanger	Steam-Water heat exchanger 2,300kW	2 units
	Cogeneration waste heat boiler	Water-tube Boiler 4.45t/h (JR central building's equipment)	3units

- Supply area of the plant

Project scale	Supply area 121,000m2 , Supply total floor area 419,015m2
District piping system	4 piping system (some part 6 way) : Cold water + Steam + (Hot water)
Supply customer	JR Central towers , Nagoya station (Subway), Nagoya station (JR Central)
Way of usage	Office, Commercial building, Hotel, Train Station