

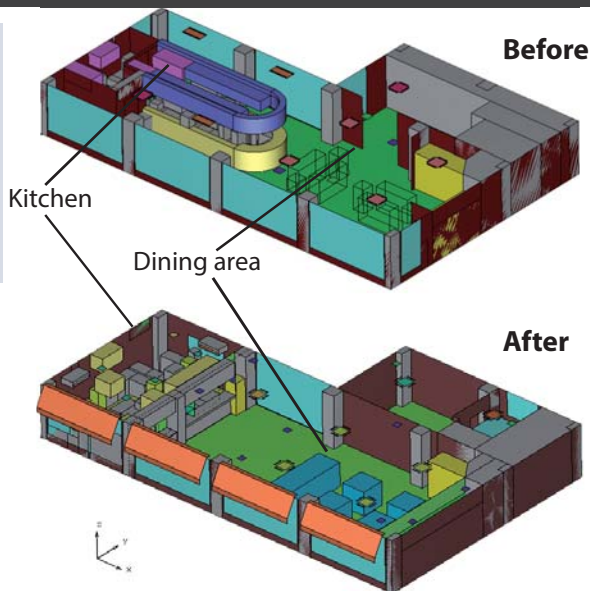
Ventilation Prediction of the Rest Area Facility

Case Study for a Client

scSTREAM verifies the improvement of energy-efficient ventilation

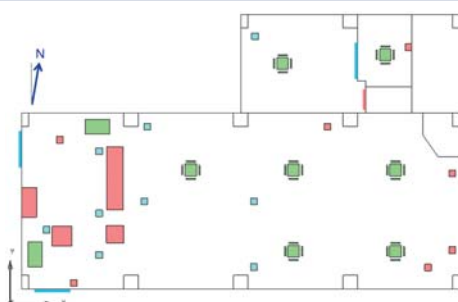
A Simulation Model and Conditions

Conditions: Steady-state analysis, turbulent model (standard k-ε model)
Summer: August 1, 2 pm (solar radiation considered), 35 deg C
Winter: February 1, 3 pm (summer radiation neglected), 1 deg C
Total heat generation from kitchen appliances:
 121,563 W (before), 123,779 W (after)



Ceiling of wall vents
In the renovated layout

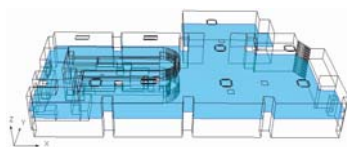
- Inlet ■
- Outlet ■
- Inlet/Outlet ■



Indoor Temperature Comparison (1.5m above floor)

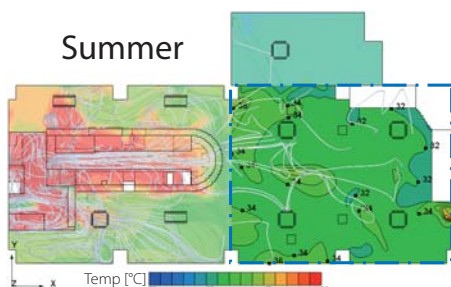
Approx. 8.2 million elements

Before renovation

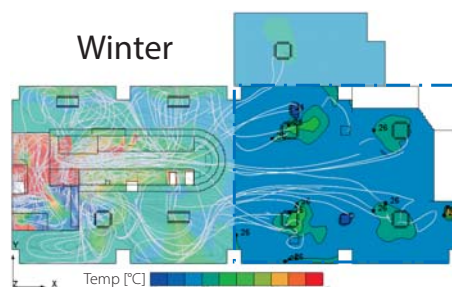


(1.5 meter above the floor)

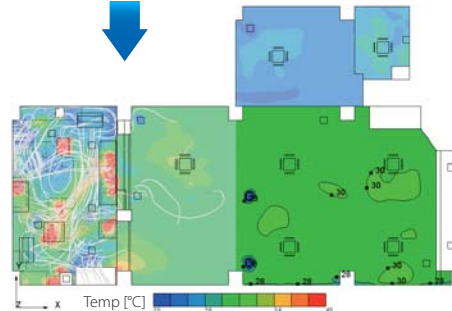
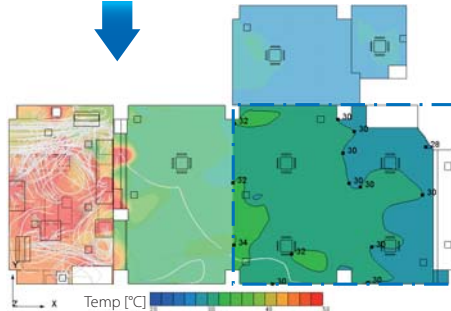
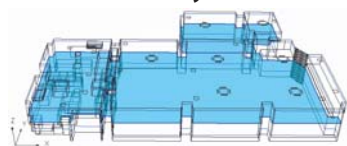
Summer



Winter



Renovated layout



	Summer	Winter
The entire facility (including kitchen)	3.9 °C Down	1.4 °C Up
The dining area	2.9 °C Down	3.8 °C Up

Simulation results show...

Room temperature in the dining area

➔ Cooler in summer and warmer in winter (better thermal environment)

Hot air outflowing from the kitchen

➔ Less spreads to the dining area

Customer Comments

For energy conservation, replacement and rearrangement of ventilation equipment area planned for the facility renovation. Thermal fluid simulation by scSTREAM is conducted to compare ventilation efficiency before and after the renovation. The result indicates that the enhancement in thermal comfort can be expected as the ventilation efficiency is improved.