



- Building Type / Use  
Residential Building

- Country  
Gothenburgh, Sweden

- Client  
Älvstranden utveckling AB

- Architect  
J Larsson White Architects A

- Occupation  
2008

## Aims

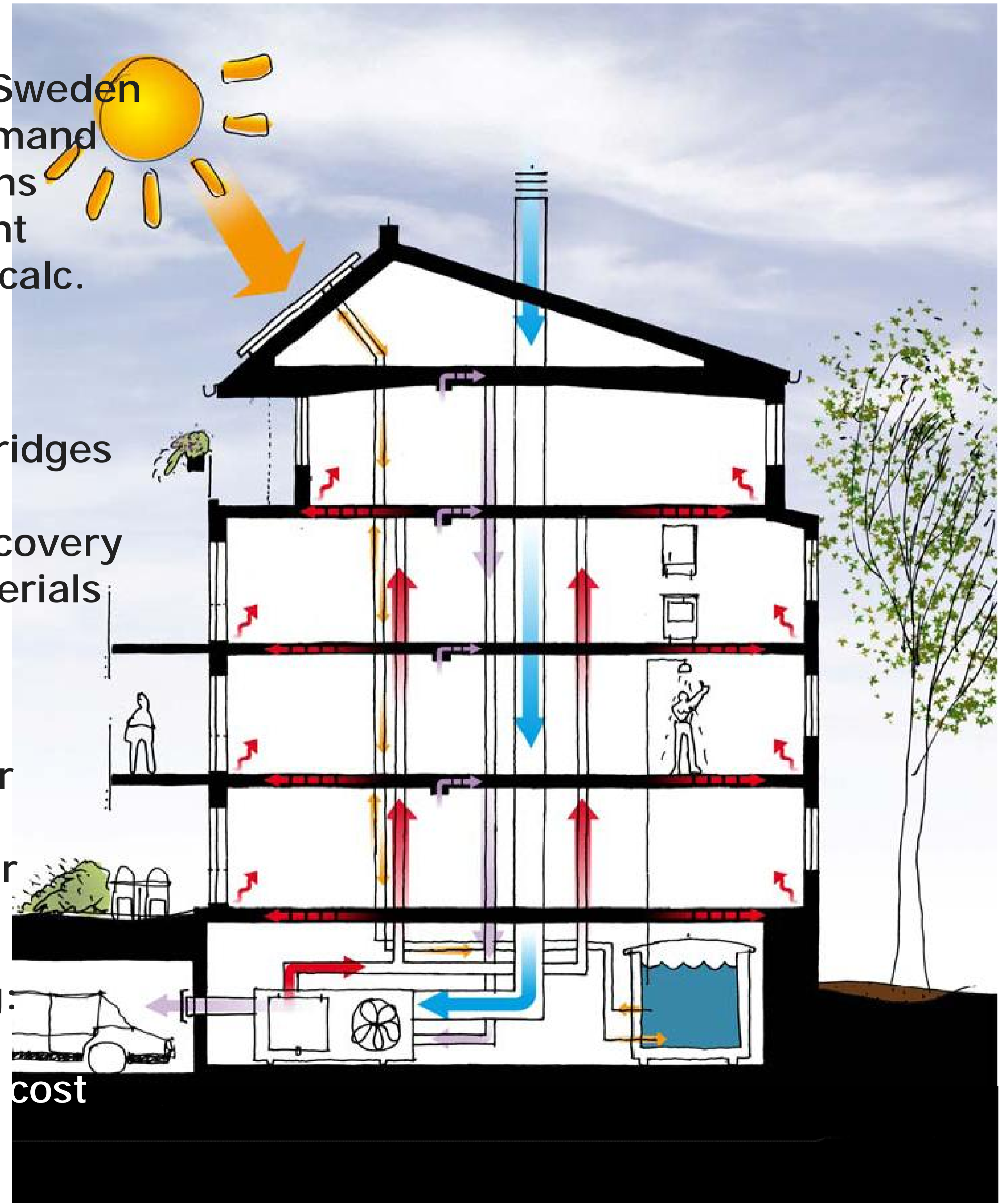
- To build the first large passive house in Sweden
- To reach a quarter of normal heating demand
- To emit a quarter of normal CO<sub>2</sub> emissions
- To create a very good indoor environment
- To make extensive simulations and LCC-calc.
- To have reasonable rents

## Solutions

- Highly insulated envelope with no cold bridges
- No conventional heating system
- Very tight envelope and efficient heat recovery
- Environmentally sound and certified materials
- Solar panels for hot water
- District heating for additional heating
- Energy efficient appliances and lighting
- Individual metering of hot and cold water
- No PVC and halogens
- Moisture control and monitoring first year

## Cost

- Additional investments for energy saving:  
2,5% = 5 million SEK ~ 550 000 EURO
- Same rent as normal due to low running cost



## Building data

Gross Floor Area: 15021 m<sup>2</sup>  
 No of flats: 115  
 Expect. no residents: 170  
 Parking under courtyard

## Heating and cooling

Very low heating demand supplied through preheated ventilation air. Energy sources are district heating and solar panels. No cooling.

## Energy

District heating 25 kWh/m<sup>2</sup>,yr  
 Building electricity 35 kWh/m<sup>2</sup>,yr  
 Solar heating 10 kWh/m<sup>2</sup>,yr  
 Bought energy 60 kWh/m<sup>2</sup>,yr

## Water

Potable water 630 l/m<sup>2</sup>,yr

## Env. impact from energy use

Climate change 2,2 kg equiv CO<sub>2</sub>/m<sup>2</sup>,yr  
 Acidification 9,8 g equiv SO<sub>2</sub>/m<sup>2</sup>,yr  
 Eutrication 19,9 g equiv NO<sub>3</sub>/m<sup>2</sup>,yr  
 Nuclear electricity 0,3 kWh/m<sup>2</sup>,yr



## ByggaBo (SE) A-D

Energy B  
Indoor B  
Chemicals B

## EcoEffect (SE) 1-6 stars

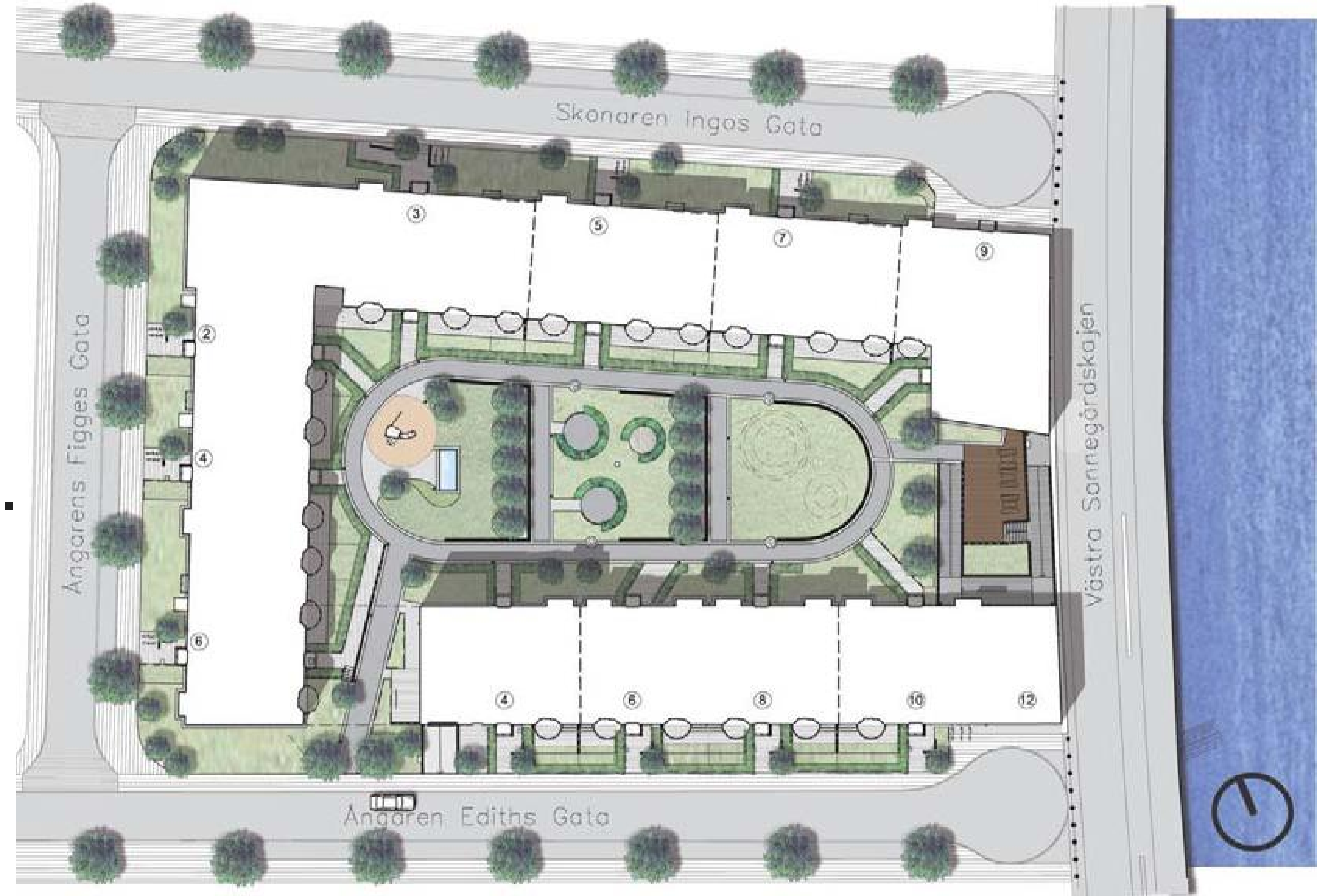
Energy ★★★★★  
Indoor ★★★★★

## LEED New cons.(US) – 92 cred.

Site 4 -6 (of 12)

Water 6 (of 10)  
Energy 15 (of 30)  
Materials 4-6 (of 14)  
Indoor 10-18 (of 19)  
Innovation 1-3 (of 7)

Certified - Gold



## Summary of Key Performance Indicators (KPI)

A	Primary Energy of Non Renewable Energy Sources		[kWh/m <sup>2</sup> <sub>GFA</sub> ]	13
B	Final Energy / Primary Energy of Renewable Energy Sources		[kWh/m <sup>2</sup> <sub>GFA</sub> ]	66
C	Total Energy, (A+B) annual data	<input checked="" type="checkbox"/> predicted <input type="checkbox"/> monitored	[kWh/m <sup>2</sup> <sub>GFA</sub> ]	79
D	CO2 Emissions (CO2 equivalent)		[kg/m <sup>2</sup> <sub>GFA</sub> ]	2
E	Potable Water Demand/Consumption, annual data	l/pers <input type="checkbox"/>	[l/m <sup>2</sup> <sub>GFA</sub> ]	630
F	Construction Cost, price level 2007		[EUR/m <sup>2</sup> <sub>GFA</sub> ]	1100
G	Operating Costs, annual, price level 2007		[EUR/m <sup>2</sup> <sub>GFA</sub> ]	15