

The Wave is an optimistic and realistic architectural concept, which seeks to explore ZNE concepts as a way of articulating higher architectural quality – rather than limiting ZNE demands to merely architectural problem solving and regulation. Hereby the focus is set on raising the general quality of life through a holistic approach, striving for a poetic unification of aesthetic, functional and technical aspects of the design.

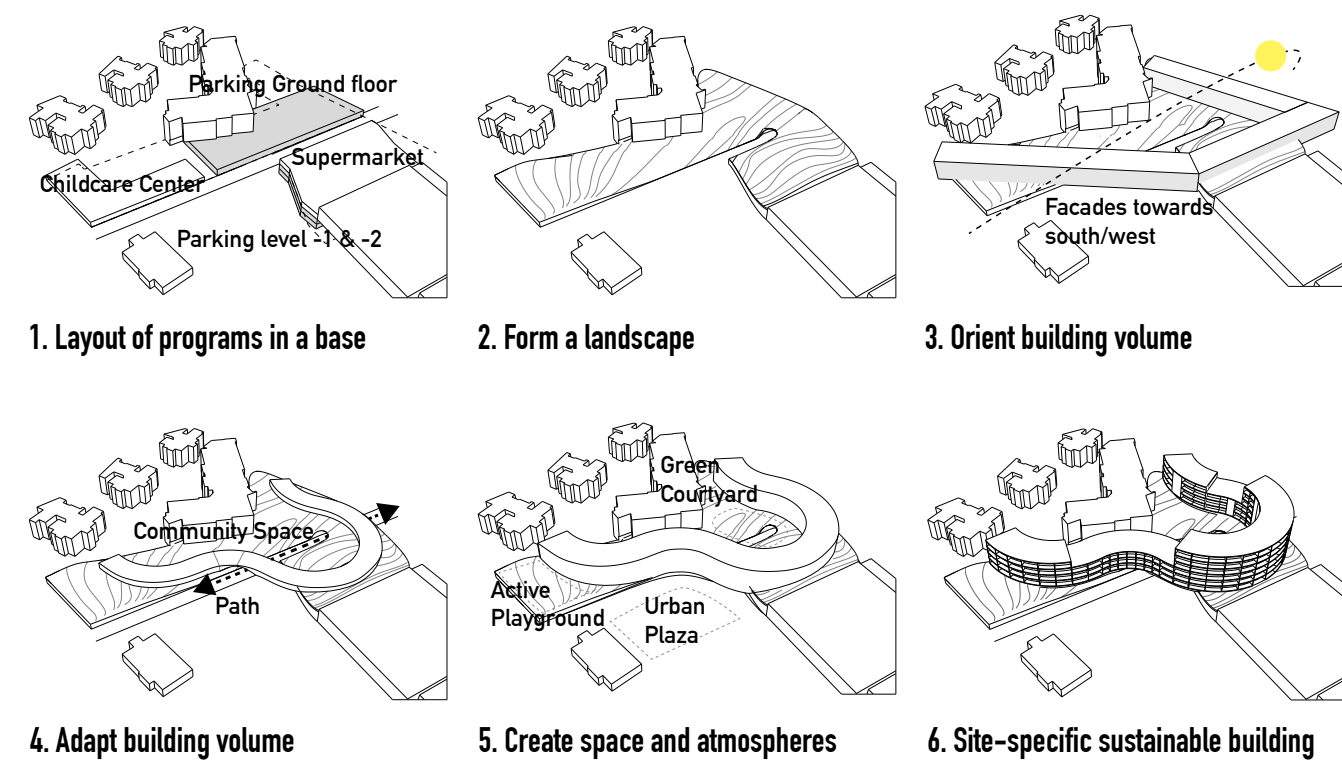
Rather than a technical and mechanical solution the project explores how architectural form can lower the energy consumption while creating better environments and spaces for human habitation.

Right now the two parcels are left over spaces in between elderly homes, grocery stores, highways and single-family houses. Instead of continuing these incoherent and spread out developments, the project introduces a development, which unifies the parcels. This unification will create a richer and coherent atmosphere of the place, which has the potential to create a stronger community by actually creating a particular place in the city, rather than just adding another development in the area.

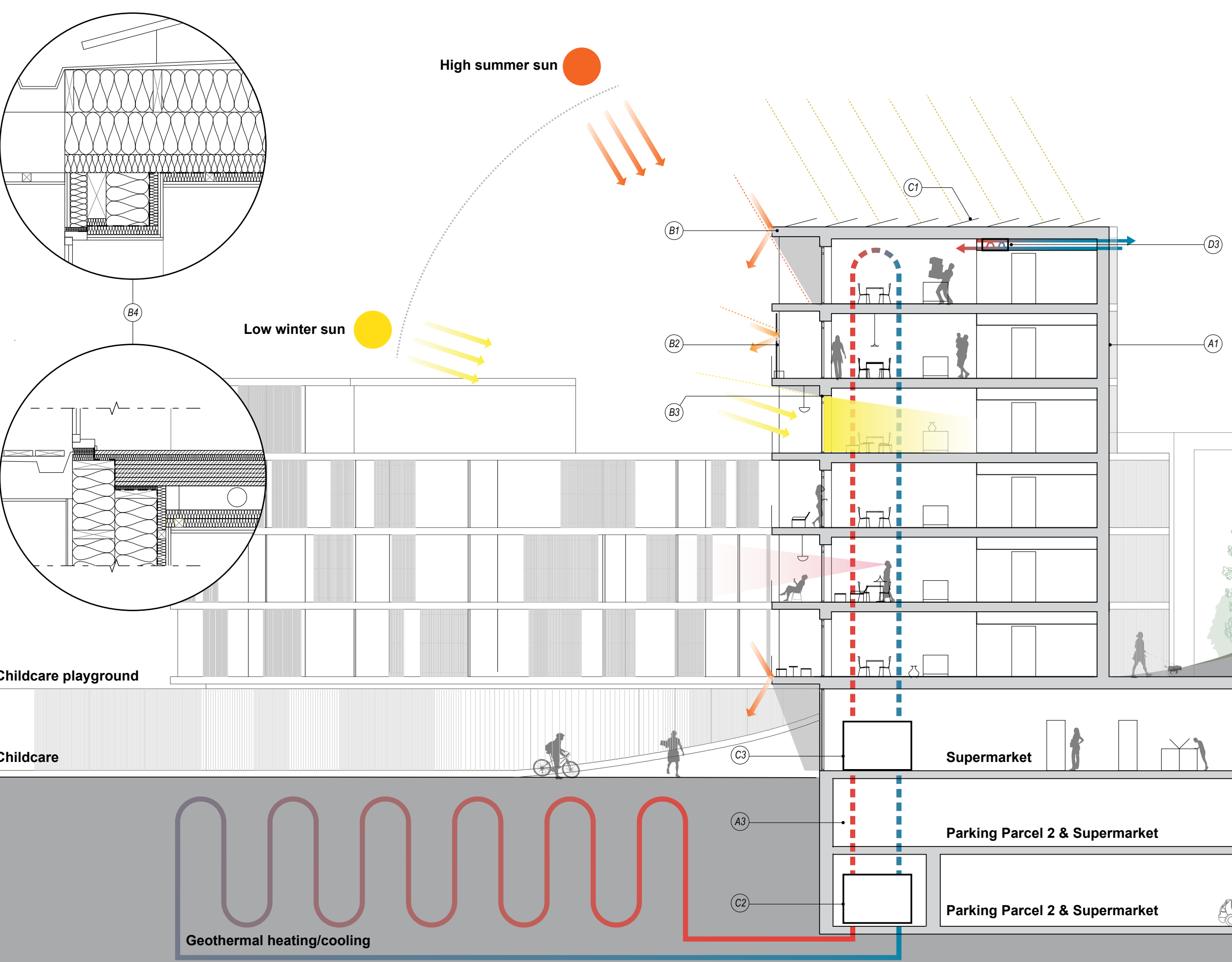
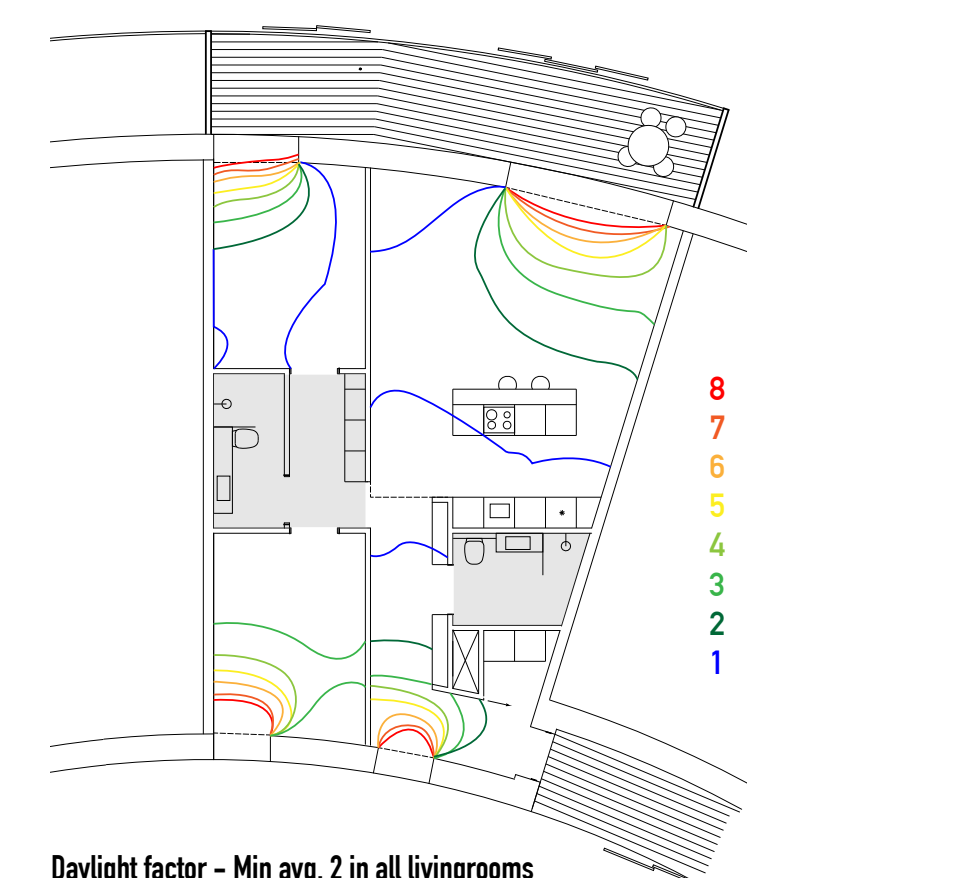
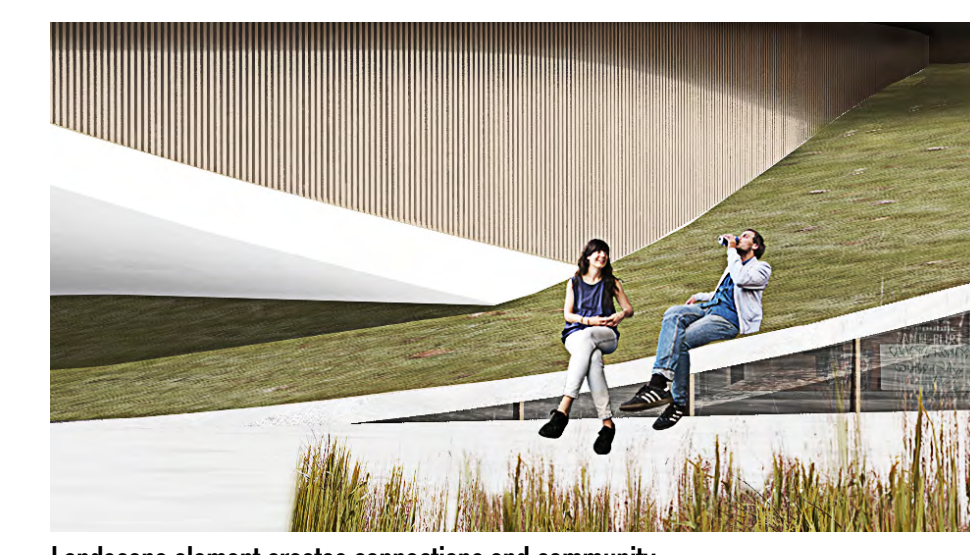
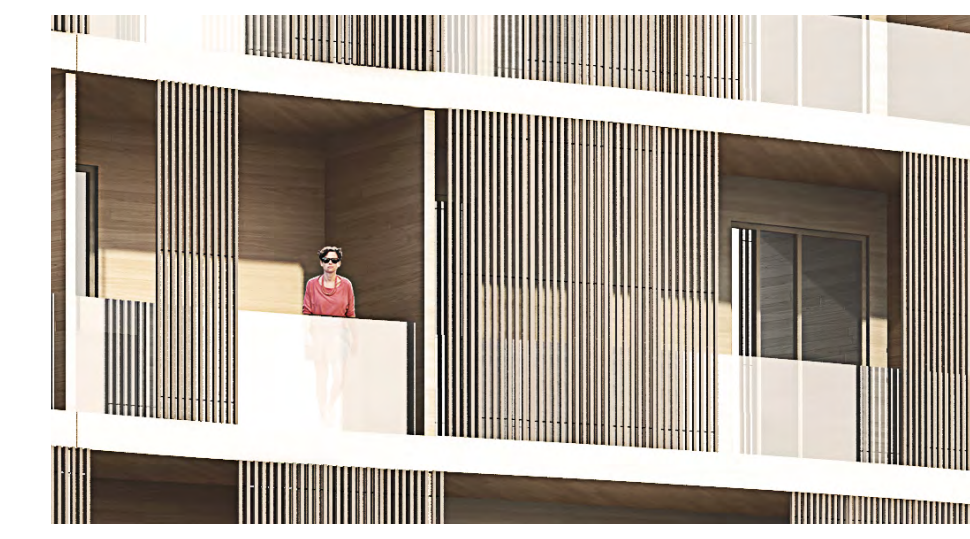
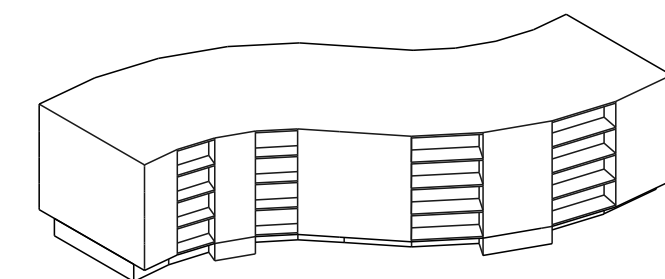
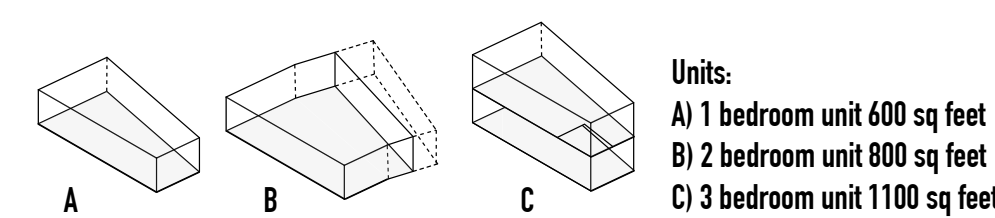
The concept is a curved development, which adapt to the site, while making sure every apartment gets direct daylight at least once a day. The compact development introduces a range of different private, semiprivate and public spaces. The big private balconies, to the semipublic green courtyard – which brings nature into the city. The active outdoor playgrounds for the inhabitants' children to play together and for the children of the kindergarten during the day. Finally the public urban plaza for outdoor markets and events. The exterior spaces are also developed according to sun and shade as protection from wind and noise from the highway.

The dwelling units are shaped to utilize natural ventilation and combined with the mechanical ventilation it ensures fresh air and energy efficient cooling and heating by being interconnected with the other programs of the development. The units are compact and functional and living space, which extend out to the balcony as a terrace in a single-family house. The balcony and movable shutter system prevents overheating while creating efficient daylight in the dwellings.

The dwellings are built from cross-laminated timber elements, which is a light construction with a low carbon footprint and its texture provides the apartment with natural warmth suitable for homes. The concept unifies the two parcels, but the concept applies on the individual parcels as a flexible development which can be split into stages. Market-rate apartments have access to private gardens and have mainly south-oriented views. The fitting quality of these apartments are designed according to target users and economy.



Two-Bedroom market-rate apartment



**Architectural features**  
A1 Compact volume with no bay windows or balconies embedded in the volume creates a minimal surface and hereby minimizes heat losses through the building skin.  
A2 A green base acts as a refuge for the inhabitants in the car dominated context. Trees help filter the air for particles, and provide the kindergarten with a green oasis as a playground. The vegetation also helps to absorb stormwater.  
A3 By placing the cars underground and in the base, we urge people move by foot or bike, and leave the car for the shorter trips.

**Passive strategies**  
B1: Balconies prevents overheating from high summer sun towards the south.  
B2: Moveable vertical lamellas prevent overheating from the lower east and west sun.  
B3: Tall windows allow natural daylight to penetrate deep into the apartments and minimize the need for artificial lighting

**B4:** Highly insulated and airtight walls creates an efficient barrier, which acts both to keep the cold inside in summer and outside in the heating season. In the interior walls cross laminated timber elements are used as a material which ensures the stability of the building, while a double layered timber construction minimizes coldbridging in the facade.

**Renewable technologies**  
C1: Photovoltaic panels on the roof produces electricity for the whole complex, and delivers leftover energy to the net when needed. It is advised to place PV's on the part of the market roof which is on parcel 2, to further increase the production.

**C2:** Earth heating and cooling. According to the time of year the massive thermal mass of the earth can be utilized on both parcels, also to storage excess heat from the supermarket in summer.  
**C3:** Leftover heat from the supermarket is used to heat the dwellings on parcel 2 during the heating season.

**Ventilation**  
D1: Automatic natural ventilation using the wind and stack effect as driving force for crossventilation is utilized in all living rooms of the units.  
D2: Single sided natural ventilation is used where there is no open connection through the spaces.  
D3: In the heating season decentralized mechanical ventilation systems are used for their ability to efficiently regain the heat from the exhaust air and create a healthy indoor environment.

The systems illustrated are general, and all of them area applicable to both parcels except C3

