Fig. 7

Move in date:	**winter 1987**
Location:	**Dalby** **10 km SE of Lund**
Project initiators:	**future residents**
Size:	**50 households**

SOLBYN

You have to watch your step when you enter the common house in Solbyn. The entry is overflowing with dozens of small boots and jackets belonging to children in the parent cooperative daycare. The large, central meeting room was welcoming with sunlight streaming in onto the yellow walls, the warm wood tones of the floor, and the brightly colored bassinets. The children were romping about the playground out back, while the chef for the daycare was cleaning up the large kitchen after serving a lacto-vegetarian lunch. The common house at the "sun village," Solbyn, is always bustling with activity. The sign up sheets for the shared sauna and laundry room, are full. You must plan ahead if you intend to reserve a bed in the visitors' guestroom.

Twice a year the residents have a big party in the common house, after a hard day of planting, cleaning, painting and doing repairs around the site. Our guide, for a group of about 15 international students, explained the philosophy behind the party as follows, "*At first we tried to pressure people to behave this way or that way, do this or that, then we realized it was easier, and much more important, to have fun. We have a lots of fun.*" She should know. She has been active since the very beginning, when a vegetarian cooking group, in 1979, decided to take their aspirations a step further. Although their first planning priority was the natural environment, the social benefits are now considered the best part of Solbyn. Seventy-three percent of respondents to a survey, conducted by Karin Palm Lindén, when asked what is best about Solbyn, cited social factors.

Solbyn is the largest ecovillage, with 50 households and about 130 people. My first view, from the bus stop, was of the parking lot and car port. A wooden sign stated "Solbyn" (sol - byn means the sun village). The parking lot is a prime site for impromptu meetings with the neighbors, ironic as it may seem for an ecovillage bent on decreasing energy consumption. The parking lot is the only entrance and exit, making it a natural meeting point for those on their way to take the bus, bicycle, drive, or drop off their trash and recyclables. The gravel pathways promptly lead between beige brick and black wood sided houses, past flower beds, tricycles and bicycles, past the copper red common house with bell tower, past the gardens and new hen house, and all the way back to a new playing field prepared by the residents to accommodate the growing number of pre-teen children. The houses are huddled together to leave room on the site for gardening, about 80 m2 per family. Residents who do not care for gardening can loan their plot to a neighbor and buy or trade for their fresh,

organic, produce later that summer. Fruit trees, nut trees and herbs were planted around the site, along with 50 centrally located, black current bushes; one for every household.

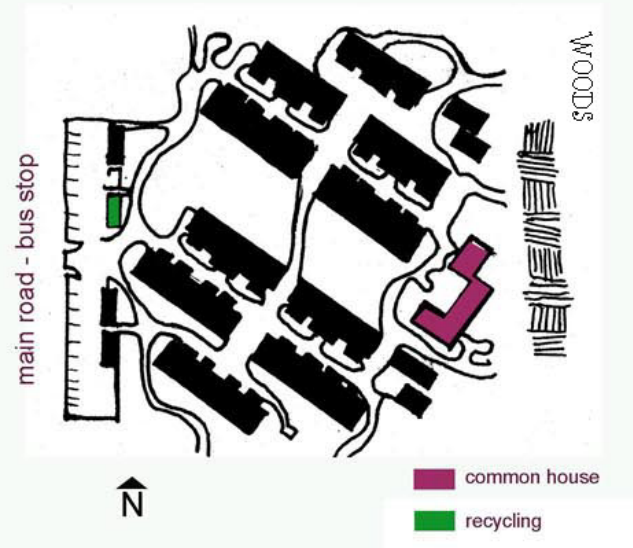

Fig. 8 - Site Diagram

Solbyn - Getting There

In 1979, a vegetarian cooking club set their sights on creating a sun village where the "community is built upon a positive attitude towards life and spiritual matters, towards nature and animals and thereby environmental protection, towards energy conservation and renewable energy, towards a vegetarian and resource conserving lifestyle and care for each other" (Persson and Karsten 3).

Unlike Tuggelite, where several members had experience in building and planning, members of the fledgling Solbyn association were not fluent in the jargon of bureaucrats, architects and engineers. This problem besieged them throughout. A lot of information was lost or misconstrued in the translation between parties. Members soon got a crash course in the politics of building development. The members knew what they wanted even if they did not yet have a detailed picture in mind. A "general idea" proved insufficient. When they approached the planning commission with their ideas they were patted on the back and sent on their way. Fortunately, politicians on the planning commission saw promise in the idea and urged further discussions. The association could go no further with their project until the planning commission approved their plan for a specific site, but the planning commission was not eager to accept their first proposal. A planning official explained, "the Solbyn project, in 1979, was not well thought-out. The planning commission has therefore, had several meetings with Solbyn association representatives and more recently with architect, Krister Wiberg and HSB. A significant amount of work had to be done to give the project a realistic design" (Persson and Karsten 6)

After the initial setback, the Solbyn association sought the advice of Krister Wiberg, an architect with experience in solar design. Wiberg was a strong supporter throughout the process and has gone on to design numerous other ecological projects. However, the support of an architect was not sufficient. The group was urged to work with an established developer, if they hoped to finance and carry out their ideas. Some members had contacts with the housing developer, HSB (see below). These contacts helped the group to sell the idea to HSB and secure HSB's commitment to the project. Four years and many meetings later, in June of 1983, a site for Solbyn was added to the city's master plan. The site did not have all the qualities they had hoped for. It was too small to accommodate the associations ideas for, office spaces, an assisted-living center (*hälsohem*) and a small store. The houses would have to be crowded to allow space for gardens and the common house. However, the location does have a

clear southwest exposure which facilitates passive solar heating.

HSB: "Hyresgästernas Spar och Byggnadskassa" or the "Tenants´ Saving and Building Association." HSB is a Swedish cooperative housing association founded in 1923. HSB provides assistance in building, financing and managing housing units. Today, HSB manages about 20% of the housing stock in Sweden. HSB has multiple regional branches. Actions described as being done by HSB in this text refer to actions by branch officials. Three different HSB branches have been involved in three ecovillage projects.

The next step by the Solbyn association was to prepare detailed plans to be passed onto the builder. HSB, as developer, and chief financial backer, was in a position to control all decisions. All consultants, except for the architect and landscape architect, were contracted by HSB. HSB specializes in working with residents after they move in, not in working with future residents, in the planning process. Some members of the Solbyn association felt HSB was acting more as an adversary than as a supporter. This view probably reflects the results of later negotiations with the contractor. Fortunately, most of the association's ideas were retained in this stage, due to architect Krister Wiberg's role as translator and as a representative of the resident's interests. The one disappointment, at this stage, was the waste water system. The association had wanted to treat their gray water (water from the shower, laundry and kitchen) on-site, but it was cost prohibitive.

The problems began in earnest when bids for a builder were sent out. The bids for construction were very high. Many cuts were made in order to reduce the cost. Most of the cuts consisted of small substitutions of inexpensive materials for more expensive, but more environmentally sound materials, such as laminate floor instead of ceramic tiles. Two cost cutting measures were particularly damaging to the function of the passive solar principles (active solar was ruled out early due to the high expense). First, the double pane glass with a low emissive coating in the glassed-in porch was changed to single pane glass. Second, the houses were planned to be built on a series of terraces with a total of six meters height difference between the highest and lowest terrace. The descending height of the houses would allow light to shine on both floors of the glassed-in porches in all seasons. The builders, to save money, leveled the site,[1] which caused the closely placed buildings to shade one another most of the winter, when sunlight is most desired. These two cost cuts, which may have seemed insignificant to the builders at the time, have had significant impact on the residents' daily life. Without the terraces, the houses seem crowded. The first floor is dark in late fall, winter and early spring, precisely when people are craving more light and most in need of the passive solar heat. The single pane glass in the terrace, dramatically reduces the length of time it

Fig. 9 - Inside sunroom

Fig. 10 - Current bushes (one per household) and the red commonhouse

can be used during the year. Some residents have installed unattractive reflective curtains to help even out the temperature, others gave up on using their porch for growing plants, and instead use it for extra storage. The problems Solbyn encountered were not the last of such problems for ecovillage hopefuls. For decades, builders and developers have designed houses without accountability to the future homeowner's quality of life in the home. The building contractor showed little, if any, concern with advancing environmental protection or other ideals. The builder did a job, no more, no less.

Not everyone was willing to weather the long wait, costs, and disappointments of building an ecovillage. Seven households persevered through the whole 10 years of planning. Most of the others, circa 70%, joined the group in the last few years of planning, between 1985-88. Thirteen of the households, circa 30%, felt they had participated a great deal in the planning process (Karsten 40).

Solbyn - Location

Solbyn is located in Dalby, a small town located in southern Sweden, mid-way between, Malmö (30km) and Lund (20km). Malmö is Sweden's second largest city, population 260,000. Ferries travel from Malmö to Copenhagen, Denmark several times an hour. Lund is a university town, population 80,000. A bus line runs from Lund to Malmö (and Malmö to Lund) twice an hour. The center of Dalby is just a few blocks west of Solbyn. The closest grocery store is about a 15 minute walk, a five minute bicycle ride. Other services are located in the center of Dalby. Schools for all ages are in walking or biking distance. A large recreation facility, with a track and playing fields, lies just down the hill to the south. Woods line the eastern edge of Solbyn.

Solbyn - Design

The fifty houses in Solbyn have a south-west exposure. They were built in 10 sets, in six rows, with four to six units in each set. The parking lot, carports, and the trash/recycling room are at the entrance. The commonhouse and storage sheds are located at the opposite end. Behind the commonhouse, and up a small hill, are the organic gardens, a hen house and a playing field. The gardens are bordered by woods. Two root cellars are located on a south facing hill by the gardens. Gravel pathways run between the houses.

The houses have a black wood, and yellow ochre brick, facade. The black roof and the facade are intended to absorb the sun's heat. The internal concrete framing of the houses, and extra thick insulation, help keep the houses warm in the winter and cool in the summer. The ventilation system is comprised of two fans, one in the kitchen and one in the bathroom. The bathroom door is kept closed and all other air, intake and outflow, passes through the fan over the stove. This fan is equipped with a heat exchanger. The outgoing air heats up the incoming air. The combination of concrete, insulation, and heat exchanger, save about 30% more energy than a house built to the 1980 minimum standard (13,300 kWh per year in Solbyn vs. 19,200

kWh in a comparable standard house) (Blomsterberg and Bülow-Hübe 7). The glass rooms, which line the southern facade of the houses, were not shown to contribute measurably to energy savings. Due to cost considerations, the homes are heated by electric radiators instead of a water-based solar and furnace combination. All of the houses were equipped with chimneys and about half of the units have installed a wood stove or ceramic stove for heating. The Solbyn handbook, *Vi bor i Solbyn - en hjälpreda för Solbybor*, explains how to burn the wood effectively, minimizing air pollution. Water, both tap water and sewage, are connected to the Dalby municipal system. The toilets are dry composting toilets with a composting container in the cellar. Some residents use this composting container for kitchen wastes as well. It took some time for residents to get the correct recipe for the toilet compost. This has been a source of frustration for them. The larger apartments, 3 rooms or more, have a low-flush toilet as well.

Solbyn - Social and organization

The most notable aspect of Solbyn is their success in fostering a sense of community. Solbyn, like Tuggelite, has had great success in maintaining a positive social network. It is also, always looking to improve upon the ecological aspects of the ecovillage. The commonhouse, as mentioned above, is a focal point for activities. In addition to day-to-day informal contact with neighbors while doing laundry, the residents, over the 10 years since Solbyn was built the residents have organized a cooking club, a baby club for parents at home with their children, a sauna club, a Friday coffee club, classes in crafts, dancing, yoga and more. Residents can reserve the large room in the common house for special events, and external groups can rent the space for meetings. Solbyn members often hold celebrations for major holidays, and residents can raise the Swedish flag on the flagpole in front of the commonhouse for major birthdays (i.e. 30, 50, 75 years), or other major life events. The commonhouse isn't the only meeting point. Many informal meetings occur in the entry to Solbyn, near the parking lot. Gardening has also been a good way for neighbors to exchange advice and stories. In the spring, Solbyn holds a exchange of seeds and plants.

The day care is a parent cooperative with space for 15 children. The day care is staffed by the city of Dalby. The childrens' parents participate in work groups and other administrative tasks, a few days a year. The children in the daycare live within Solbyn or in the Dalby surroundings.

Solbyn is somewhat unusual in that, as a newly built development it housed many retirees and other small households without children (Karsten 33). Only 18% of the original households had a traditional nuclear family (two parents with children). Over half of the households were singles, two-thirds of which were over 50 (Karsten 34). The number of households with children has risen over the years, from 34% to 54%, and the number of individuals over 65 has also risen from 12% to 20% (Lindén 29). This change means that there are more people home during the daytime

Fig. 11- Daycare

hours, which helps dispel the feeling of a "bedroom community." However, the increasing number of older residents, whose mobility is decreasing, raises questions about the accommodation of their changing needs.

Solbyn is managed by the residents for the residents. An open meeting is held every month to discuss concerns. The attendance at meetings is low, unless a particular topic of interest is being addressed. The Board, all residents themselves, hopes to introduce themes to the meetings to increase interest and attendance. Sometimes as few as three people, in addition to the Board, show up. The Board is left to make decisions on their own, which has the effect of creating an "us vs. them" attitude, which is not conducive to democracy or harmony in the group at large. It is hoped that increasing attendance at meetings, and increasing the participation in workgroups and decision-making will help recapture the sense of solidarity in the group. Residents can chose with discretion which of the 19 workgroups in which they wish to participate. The work groups are currently in the process of being reorganized to insure a better distribution of tasks.

Each of the ten groups of houses is in charge of the outdoor maintenance of their immediate area. Maintenance tasks include mowing, repairing roof tiles, and other chores. Twice a year, everyone participates in a big clean up day, and congratulates each other at the end of the day on a job well done. A big meal and party then follows.

Information exchange is an important part of the successful function of Solbyn. A newsletter, the *Solby Bladet*, founded in 1988, is distributed once a month. It contains information about upcoming events, tips, recommendations, recipes, a summary of decisions effecting the group, skills for trade or sale, reminders about recycling; birth, birthday and party announcements, work groups, work days, tasks to be completed, and much more. Solbyn has also developed a handbook for residents, *Vi bor i Solbyn - en hjälpreda för Solbybor.* It is very comprehensive and includes such items as tips on disposing of your wood ash; whom to see when you get locked out of your house, and tasty vegetarian recipes. The handbook is a good reference for old and new residents alike.

Solbyn has also made great efforts to inform and engage others outside of their neighborhood. To increase awareness and acceptance of Solbyn by surrounding locals, the residents have several times held "Solby Day." Activities included guided tours of the houses, common house and root cellars in Solbyn; a yard sale, a café; a candle, art and photo sale. In addition, the Solby orchestra provides music. Tours of Solbyn are given frequently throughout the year. The information workgroup and other volunteers have over the years, led literally hundreds of tours.

Solbyn - Resources

Solbyn is well documented, particularly from the social perspective. The project has received a good deal of media coverage. The information workgroup is responsible for collecting documents, news clips, and other coverage of Solbyn. In addition, there are several reports written by academics, ten years of the newsletter Solbybladet, and *Vi bor i Solbyn - en hjälpreda för Solbybor*, the handbook for Solbyn residents. Copies of the Solbybladet and handbook are available for viewing, but are not offered to the general public because the group at some point would like to compile and publish these resources.

Solbyn före inflyttningen: Tillkomst, inflyttning och befolkning is the first of a two part study of the collective organization and responsibilities of Solbyn residents. It was written by Bengt Persson and Eva Karsten and sponsored by Statens Råd för byggnadsforskning and Lund Tekniska Högskola. In this study future residents were interviewed prior to occupancy. The report gives an in-depth description of the Solbyn planning process and the residents' goals, disappointments and successes. This study is an excellent resource for others' involved in planning similar projects. It contains many examples of the planning process which reveal helpful hints.

Ekologi och Vardagsliv: En studie av två ekobyar by Karin Palm Lindén is the follow-up study to the above work by Persson and Karsten. The report looks at two ecovillages, Solbyn and Myrstacken. "The main theme of the report is how living in an ecovillage influences the inhabitant's everyday lives." In other words this study focuses on the resident's experience and the effect of design on behavior.

Solbyn i Dalby: utvärdering av en energisnål raduslägenhet med glasrum by Helena Bülow-Hübe and Åke Blomsterberg, presents the results and recommendations from their two year study of the energy use and indoor air climate in one row of apartments in Solbyn. They proves that a heat exchanger and extra insulation have contributed to energy savings for residents. The study was sponsored by Statens Råd för byggnadsforskning and Lund Tekniska Högskola.

Ekologiskt Byggande: En studie av tre ekobyar i HSB:s regi by Hans Bergström provides a technical description of all the facets of the ecovillages HSB has helped develop; Solbyn, Myrstacken and Understenshöjden.

Solbyn - Overview

Planning start:	Spring 1979	Number of Households:	50 households, circa 130 people
Move in date:	Winter 1987	Size of homes:	20 at 63m2, 2 room + 8.5 m2 terrace
Location:	Dalby		10 at 74m2, 3 room + 11m2 terrace
	10 km SE of Lund		10 at 92m2, 4 room + 11m2 terrace
Project initiators:	future residents		10 at 116m2, 5 room + 11m2 terrace
Project leader:	Lars Olderius, HSB	Type of ownership:	home owner's association
Architect:	Krister Wiberg	Project developers:	HSB
Landscape architect:	Bengt Persson	Builder:	Kullenbergbyggen, steered total contractor
		Building cost:	10,600 SEK/m2 at 1988 prices

S I T E	
Location:	medium walk or short bike to Dalby center (population 6,500), stores and schools and other services - most commute to Lund or Malmo for work daycare on site, woods right next to site for hiking/walking, athletic facilities around corner
Transportation:	bus route - every half hour - 25 minute bus ride to Lund, 35 to Malmo, 35 - 50 minute bike ride to Lund
Design:	18, 040 m2, 6,380 m2 of which is gardening space 10 groups of two story houses with 4-6 apartments in each houses with souhwest orientaion to utilize passive solar principles parking and car ports on street side, common house and gardens on far side from entrance automobile free gravel pathways play areas - playground behind common house, ball field behind gardens, music room in commonhouse
Landscaping:	all original plants were edible or otherwise 'useful' (t.ex for fruit, berries, herbs, textile dyes), flowers and other ornamentals since planted homes terrassed, space with 50 black currant bushes - one for each household - as central green space consideration of plants in regulating the micro-climate, such as wind breaks
Gardens:	each household has a plot - sizes vary according to apartment size, t.ex. 2 room = 69m2, 5 room = 96 m2, day care has plot too. Common plot for perennials and spice plants. plots are each household's responsibility - can loan plot to another household in one year intervals No chemicals - every spring common supply of manure purchased separate compost heaps for household, toilet, and yard waste - some compost kitchen waste with toilet compost, others have individual outdoor compost which they later add to the shared heap four fiberglass root cellars
Common house:	253 m2 - ca 5 m2 per household, single story, similar materials to those in other houses laundry room used by all residents, large kitchen, meeting room, sound proof music room, library, guest room, weaving loom, and photography dark room day care in common house
other structures:	additional spaces include a garage/storage space for shared machinery, shed for wood, bikes and extra storage for apartments

House exterior:	brick and wood facade - lower 1/2 beige bricks, upper half black stained pine siding black roofing tiles made of cement one and two story glassrooms on southern facades
INTERIOR	
General:	houses designed on passive solar principles
Floor plan:	variation between different sizes, generally bedrooms on north side, kitchen and living room on south side by glass room, small apartments have shared entry, foyer in units with single entry have inner and outer door, 10 units have second floor entry
Foundation:	reinforced concrete slab on 20 cm ground insulation (Sundolitt) over 15 cm drainage layer of macadam, and 60 cm skirt around foundation (U-value 0.13 W/m2 C)
Frame:	bearing concrete frame for storage capacity of solar heat
Insulation:	outer walls - 28.5 cm Rockwool mineral wool *(U-value 0.14 W/m2 C)*, 26 cm cellplast over concrete frame, attic - 50 cm Rockwool mineral wool (U-value 0.11 W/m2 C)
Floors:	oak laminate in living room/kitchen, linoleum in bedrooms, plastic mat in bathroom and clinkers lining bathtub/shower and sink
Walls:	interior concrete heart wall for storage capacity of solar heat, interior walls wood frame and drywall, dividing walls - concrete, outer walls have plasitc diffusion layer, walls are painted or wallpapered
Woodwork:	stairs and railings laquered pine, baseboards pained with latex paint
Windows:	less and smaller windows on north side, 2+1 glazing - innermost glazing is low emissive glass (U-value 1.6 W/m2 C), painted wooden frames
Glass rooms:	aluminum framed single glass with concrete floor and wooden planters
Kitchen:	cabinets painted with enamel, white plastic laminate countertops, larger units have pantry in addition to refridgerator/freezer
SYSTEMS	
Heating:	electric radiators and water heaters, some heat stored in concrete walls, a portion of members have bought shares in wind turbines to offset impact of electricity consumption from non-renewable sources, over 1/2 of units have ceramic stoves
Ventilation:	all intake and outtake through fan over stove with cross stream a heat exchanger - manual or automatic control, bathroom has separate fan - intake from within house, out through attic
Water:	municipal tap water, had drilled a 130 m well but were required by city to use municipal supplies instead shared storage of rain water watering
gray water:	connected to municipal sewage
black water:	composting toilets (Snurredassen and Lindens Multrum), in units with two toilets - second toilet is a low-flush water toilet (Gustavsberg) connected to municipal sewage
Electricity:	standard, households have separate meters
Trash/Recycling:	standard under the sink container for recyclables, municipal recycling pre-sorted at site - containers by parking area