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IMPLEMENTATION OF SOLAR ENERGY IN URBAN PLANNING IN FOUR EUROPEAN REGIONS

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Renewable energy, Rational Use of Energy, and Sustainable Design are aspects for the coming building programmes, among many other qualitative aspects. How could sustainable use of energy be integrated in planning and building process ?

- **Which considerations should be made on the level of urban planning**
- **Which participants play a key role**
- **How could these considerations become part of new urban schemes**
- **What consequences do they have for urban design aspects**

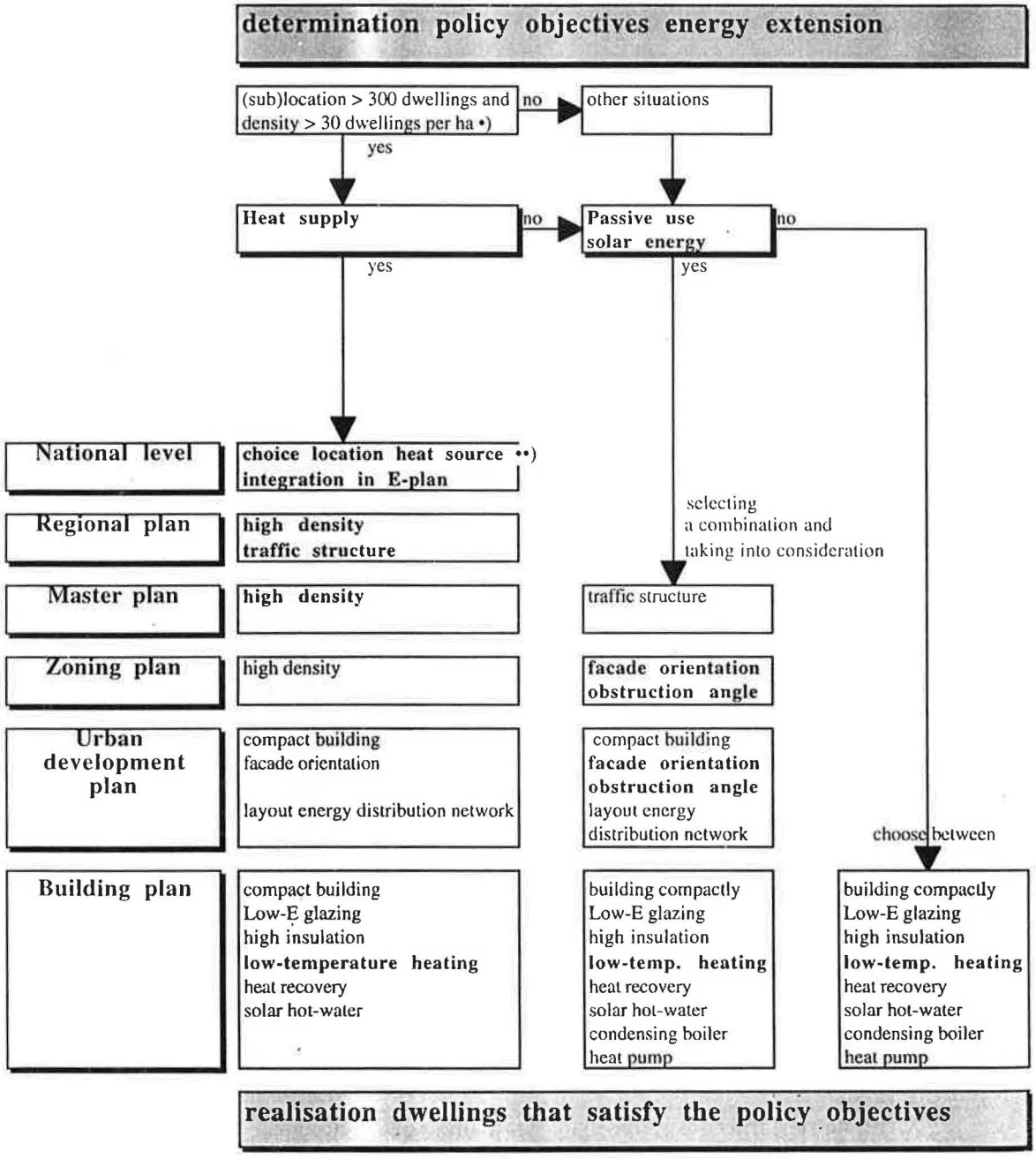
Four European regions, Haaglanden (Netherlands), Vaasa (Finland), Nord Pas de Calais and Alpes Cote d' Azur (France), and Greece have looked for answers within the frameworkof an ALTENER project: Implementation of solar energy in urban planning. (Contract 4.1030/AL/41/95-NL)
The project aims to provide energy agencies with information on implementation possibilities for solar energy in urban planning. Therefore, a binder has been produced, containing state-of-the-art reports of four European regions; proposals for decision trees for implementation of solar energy and a set of good practice examples throughout Europe.

1. Decision tree energy and urban planning

In The Netherlands, a type of analytical model, or decision tree on Energy and Urban Planning has been developed (see the next page). This model has been adopted to evaluate the regional plans in the involved European regions.

2. The Netherlands, Regional plan: Haaglanden, Zuid Holland

The Netherlands contribution was the project Haaglanden in the Province of Zuid Holland, The Netherlands. The region of Haaglanden is a major urban extension of the region The Hague. Haaglanden consists of six locations: Wateringse Veld, Ypenburg, Leidschenveen, Zoetermeer Oost, Pijnacker Zuid en Delfgauw. The total number of new dwellings is 49,500 to be built in the period 1995 - 2005. The average density of dwellings will be 30 to 35 per hectare. On each location also office buildings are planned. The six locations involve seven municipalities and three utility companies.



•) The main criterion for heat distribution is the heat consumption per hectare.
An indication of that can be derived from the number of dwellings and the density.
Heat sales prospects in neighbouring existing houses and companies or the fact that a pipeline network is already available increase the feasibility of heat distribution. A feasibility study per location will reveal the optimum combination.

••) Elements printed in bold are essential to the solution path chosen.

2.1. Conclusions

- There is a lack of continuity in decisions on solar energy, from the planning level, down to the building level. For each planning phase there is a need for defined 'starting points', evaluation criteria, and achieved results. These results should be transferred to the next planning phase.
- The shown lack of continuity may help to define, what kind of criteria and design tools are helpful in different planning phases.
- There is a strong need for good examples to show clients, developers and designers.

Priority Netherlands: Communication plans and good examples

3. France, Regional plans in Southern France and Nord-Pas de Calais

The French contribution was built on two regional projects. One is proposed by GERES, Marseille. The second was conducted by the AGENCE RÉGIONALE DE L'ÉNERGIE, Nord Pas de Calais, Lille.
The first project consists on a technical and logistic assistance to small and medium town municipalities (typicaly sized up to 15000 inhabitants) in the development of energy conscious projects according their urban planning requirements.
The second project will be promoted by the Agence régionale de l'Énergie of Lille. For a long time, the Agence régionale de l'Énergie has been developing very numerous <<energy assignments>> toward small town councils (less than 4000 inhabitants) (see then following notes). The Altener project offered the opportunity to reinforce these past actions and to develop a comprehensive methodology.

3.1. Conclusions

- Energy is not a priority (low costs)
- CO2 effects and quality of life concerns are upcoming items in public opinion
- Impulse in Renewable Energy is given by European level
- The image of solar energy in buildings is poor, as there are only early examples of active solar systems that were not successfull.
- Simple and passive solutions are preferable for implementation in the French market
- Lack of strongly organized lobby
- General lack of information - communication and training
- A winner team for an renewable energy building project consists of:
  - national or regional policy (support and subsidies)
  - public decision maker included in quality of buildings
  - expert previously trained in solar energy

Priority France: Improve image of solar energy

4. Finland, Regional and local plans in City of Vaasa

The object of the Finnish involvement is the Ristinummi Suburb which is situated in Vaasa (55.000 inhabitants). It is mainly built in the 1970s and it is in need of a techno-functional renovation. The area has been chosen as the object for an architectural competition on ecological renovation. It will also be a national example of neighbourhood improvement and renovation planning. Simultaniously, the possibility to use solar heating will be examined both in new and renovation construction. The Ristinummi renovation will cover a large amount of the multifamily buildings. In addition new buildings will be planned for 4,000 - 5,000 inhabitants which means a ration of 50/50% between old and new constructions.

4.1. Conclusions

- In Finland there is not an executive power on national level
- Sustainable development is getting "normal"
- Central problem is a lack of information on all levels in the chain of decision makers
- Need for Communication plans on practical levels. Target groups are 1) Town planning regulations, 2) Decision makers / builders / architects

Priority Finland: Communication plan and good examples

5. Greece, Bioclimatic Design

Alex Tombazis contributed to the project with special emphasis to bioclimatic design.

Bioclimatic, site and climatic sensitive design (passive solar heating and passive cooling) and low-energy-consumption constructions have grown into one of his firm's main design considerations during the past twenty years.

Since the design in 1977 of the first building in Greece to be heated entirely by solar energy, an 80m2 vacation house on the Peloponnesos using active solar heating systems, the company's design philosophy has changed. What was considered as an innovative and technologically interesting approach is now viewed as a dynamically integrated whole, in which passive solar heating, passive cooling and daylighting design principles dominate from the beginning of design conception. No difference is being made between solar and other buildings, all buildings are considered as simply making good or bad use of sun, wind and other climatic conditions.

Concerning the architectural design in most projects there exists a central idea, a design principle, which is the result of a preconceived statement or a result of factors of critical importance in each case, such as the particularity of place, natural or manmade.

Further to this principle detailed studies are carried out for each project by the architecs and by exterior collaborators, that are bought in for this purpose as needed each time. This method leads to every project being the result of a continuous dialogue between the architects and the energy consultants, in

order to assure the combination of aesthetic quality of design with an optimum use of climatic conditions.

5.1. Conclusions

National level	Moving in the right direction from the central planning / legislation point of view (Governmental (national) planning and legislation)
Difficulties	Implementation of legislation, i.e. control, education
Particularities	1. Town planning is not executed on a local government / community level. That is why legislation is important (rules of the game to be used by the many players) 2. Very few urban planning is executed on a larger scale by one executee, most execution (development) takes place on an individual private level.
Priority Greece:	Establish concept and targets on local level

6. Overall conclusions

The conclusions from the projects are that the type of actions to implement solar energy varies from region to region, or from country to country. It is been concluded that for France awareness campaigns have first priority. In Greece current changes in building legislation provide good opportunities for setting standards on renewable energy. In Finland and Netherlands, focus should be on practical level, while bottlenecks are no longer awareness and political commitment.

For all four countries there is a strong need for Communication Plans on implementation of solar energy in urban planning.Target groups are: town planning regulations, decision makers / builders / architects. There is a lack of continuity in decisions on solar energy, from the planning level, down to the building level. For each planning phase, there is a need for defined 'starting points', evaluation criteria and achieved results. The project may help energy agencies to define their strategies in implementing solar energy in urban planning, by a more clear understanding of the process.

Reference

Title:	Implementation of solar energy in urban planning in four European regions
Ref.	Report number 4009

The final binder can be ordered for 25 ECU plus mail costs

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Annexes: Good practice example of solar energy in urban planning

"Bloemendaal", The Hague, The Netherlands

• 142 Sustainable houses in a park area near the Dutch coast
Carefully situated housing in the park of a mental clinic

• Integrated energy efficiency
- compact building
- improved insulation of floors and LE-glazing
- individual solar domestic hot water systems for all houses
- individual condensing gas boilers
- double load-bearing walls to prevent sound nuisance between dwellings

• Landscape oriented master plan with good use of existing ecological elements
- a conscious design of the non-built area, saving flora and fauna
- sustainable building materials
- watersaving toilets and showerheads, flowreductors on taps

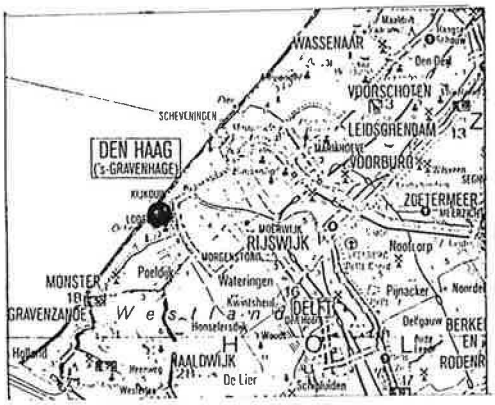
• Housing for patients, employees and others
- integration of mentally disabled into society
- offering a unique housing location near the city of The Hague

• Succesful cooperation
- the project could be realized due to a close cooperation between the clinic foundation and the housing association of the municipality of The Hague.

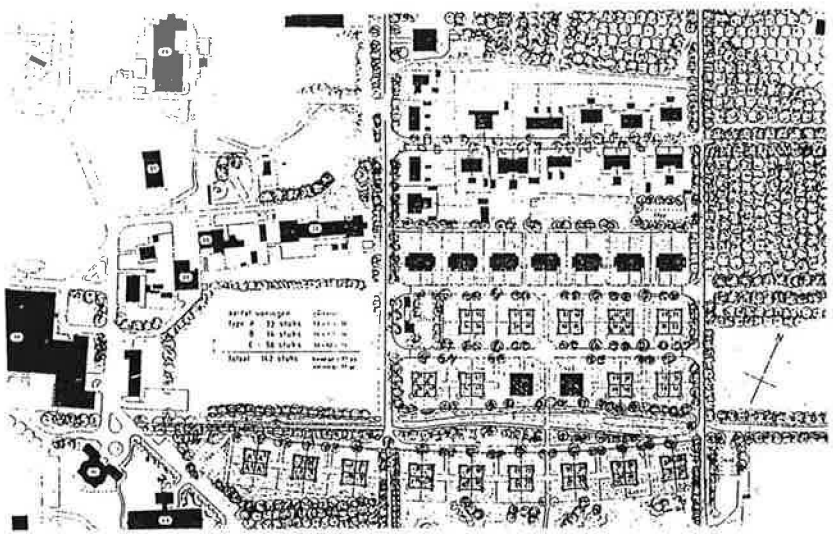
Regional and urban level 2

Solar design aspects

Site



Urban plan



Urban development: The clinic wanted to realize attractive housing for her employees and a part of her patients who are able to live on their own

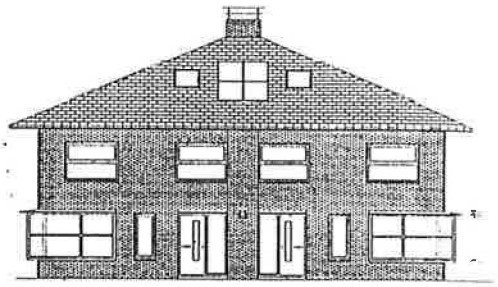
Why solar: To reduce the growing needs for domestic hot water

Participants: Woningbedrijf Den Haag, Psychiatrisch centrum Bloemendaal, ARPROS-architecten, J.G. Nelis Bouw bv, W/E consultants sustainable building, SEV.

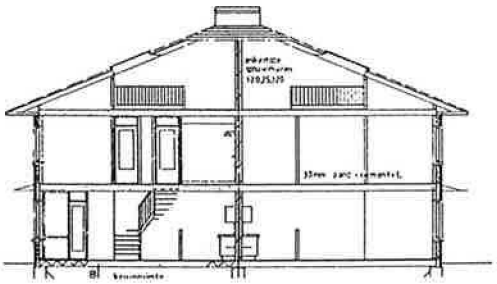
Time schedule: initiative 1992 , design 1992/93 , construction1994/95, completion1995.

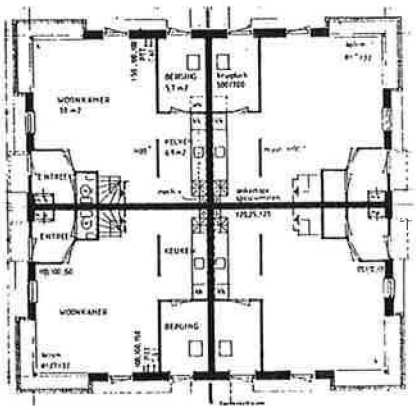
Block and building scale 3

Block scale



Building, type A: 4 individual dwellings





Solar design aspects of the building

• Individual solar domestic hot water systems using 2,8 m2 collector area for each dwelling
Each building type A consists of 4 individual dwellings.
Two of them have unfavourable situated roofs, facing NNW and ENE.
The collectors for these dwellings are situated on the roofs of the two well-situated dwellings in the block.