

SUSTAINABLE MUNICIPALITY

4 big leaps and 20 small steps

Conceptual guidelines on sustainable spatial planning

*Methods and tools
to integrate
sustainability and energy
matters into spatial planning,
with a focus on heating
and transport.*



Publications issued by the Swedish Energy Agency
can be ordered or downloaded at www.energimyndigheten.se,
or ordered by e-mailing
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ET 2012:14

December 2011

Circulation: 100 copies

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About sustainable municipalities and urban planning

The Sustainable Municipality programme is the Swedish Energy Agency's programme for sustainable development at a local level. It offers various forms of expert support to develop and strengthen local efforts concerning energy issues. Sustainable Municipality began as a project involving five municipalities.

It is now entering its third programme period and a total of 38 municipalities are involved. The municipalities of Sweden ("kommun" in Swedish) are the local government entities of Sweden. There are currently 290 municipalities organized into 21 counties.

Within the framework of the Sustainable Municipality programme (the SM) the Urban Planning theme energy issues have been integrated into urban planning by developing target-group adapted tools and methods. The work has been conducted as a development and research project in cooperation with Professor and Ph.D. Ulf Ranhagen, who has worked as process manager and lecturer, and Technical Licentiate Mats Johan Lundström, who has worked on documentation and lecturing. Both of these are from the Institution for Urban Planning at KTH Royal Institute of Technology in Stockholm, Sweden.

The work has been conducted through a series of workshops. To ensure adequate quality in terms of expertise and process support, the municipalities have been categorised in four regional clusters and what is known as a metropolitan cluster:

The Swedish Energy Agency's programme is unique for two reasons: firstly it is based on distinct cooperation between local and government levels, and secondly the support from central government takes the form of expertise and network building, not funding.

A well-known success factor for local energy and climate work is that it is well-rooted and prioritised among leading politicians and public officials at the municipal level. Accordingly, Sustainable Municipality includes efforts that focus on and involve both of these groups.

The overall objective of Sustainable Municipality is to develop the municipalities' work methods and find cooperation models to integrate energy and climate issues into political work.

Sustainable Municipality's goals may be summarised in the following three points:

- Develop a local energy and climate effort based on broad political support.
- Develop new and existing work methods and cooperation models, locally and regionally, in the areas of urban planning and industrial policy.
- Develop and distribute methods, manuals, indicators and cutting-edge examples involving urban planning and industrial policy

The following experts have contributed to the process to add an in-depth perspective:

- Ph.D. Dag Henning, Optensys AB (energy systems, estimation of carbon emissions from energy production as well as heating, cooling and electricity in buildings).
- Master of Engineering Leif Magnusson, Environmental Manager at Västtrafik (transport systems, estimation of carbon emissions from transport).
- Technical Licentiate Eidar Lindgren, KTH Royal Institute of Technology in Stockholm, Sweden, (agreements as control tools).
- Architect SAR-MSA/ Kristina Adolfsson, the Swedish National Board of Housing, Building and Planning (plans as control tools).
- Ph.D. Patrik Tornberg, KTH Royal Institute of Technology in Stockholm, Sweden (forms of cooperation in the planning process).
- Planner architect FPR-MSA Anders Nilsson, White/SWECO (digital platforms for interaction).
- Associate Professor Mats Johansson, KTH Royal Institute of Technology in Stockholm, Sweden (regional enlargement).



Notice to readers

Within the framework of the Sustainable Municipality programme (the SM) target-group adapted tools and methods have been developed as a means to discuss the urban planning energy issues. This work has been conducted as a R&D project in cooperation with the Institution for Urban Planning at KTH Royal Institute of Technology in Stockholm, Sweden. Professor and Ph.D. Ulf Ranhagen, who worked as the project's process manager and lecturer, and Technical Licentiate Mats Johan Lundström, was responsible for documentation and lecturing.

This conceptual publication is presented as a work process comprising four main steps and 20 sub-steps based on the approach developed during phase two of the Sustainable Municipality programme. Experiences were also gathered from the first pilot phase of the programme (2004-2007).

The contents of the description are also based on the written reflections produced by the majority of the participating municipalities. In the publication, the municipalities reflect on the strengths and weaknesses of the various methods and tools.

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Flexible approach in four main steps

All the phases presented herein need not be conducted sequentially. The entire point of the approach is that, while clearly being systematic, it must also be flexible to enable an application adapted to the needs of the specific planning situation. The various examples given in the document illustrate how methods and tools can be adapted to local conditions.

The approach is presented in the form of four main steps and the associated sub-steps.

The main steps are:

1. Organise the planning work.
2. Integrate sustainability issues in the comprehensive plan.
3. Integrate energy issues for heating, cooling, electricity and transport.
4. Develop a strategy (action plan) for execution and follow-up.

The approach is primarily adapted to planning at an overall level (the comprehensive plan or detailed comprehensive plan).



1 Formulate the planning work

1. Application of a systematic and flexible approach

A key basis for the Sustainable Municipality Programme (SM) has been the introduction of a systematic approach to the integration of sustainability and energy issues into urban planning, and to apply and advance it in municipalities in the various size ranges in different parts of the country. The approach and the various stages should be viewed as a way to intensify work on analysing documentation and designing and evaluating plan proposals in the comprehensive planning process formally regulated by the Planning and Building Act. The aim is to present a process-oriented supplement to the complete comprehensive planning process, as described in the Swedish National Board of Housing, Building and Planning's documents on comprehensive planning.

2. Form a cross-sectoral project organisation

Cross-sectoral partnerships are a success factor in spatial planning. Achieving better planning results requires coordinated and integrated work on sustainability and energy issues. Under the SM, officials in municipal management positions were the key target group. Social planners and strategists are a key group since they are in charge of urban planning and their role becomes something of a “spider in the net.”



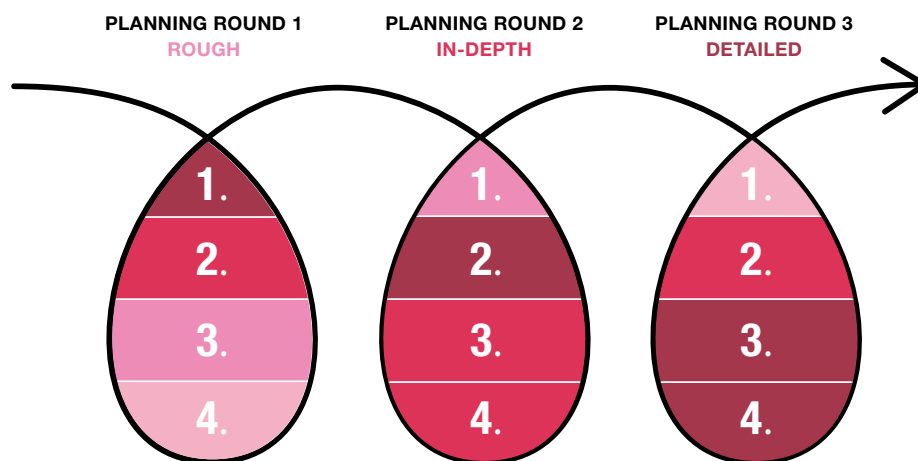
Cross-sectoral planning – new cooperation formats between, for example, politicians, officials, social associations and energy companies in the comprehensive planning process.

Inclusion of the transport energy dimension requires close cooperation with traffic planning specialists, environmental strategists and energy and climate officials. As regards heating and electric energy, urban planning needs to be developed into a more strategic control policy to illustrate the opportunities to create a balance between enhancement of energy efficiency in buildings and renewable supply. Accordingly, it is crucial that an early dialogue is created between urban and regional planners, environmental strategists, energy and climate officials and representatives of energy companies. The inclusion of property management and land development departments, planning architects and building inspectors in early dialogue increases the effectiveness of urban planning in integrating energy issues in the construction process and enhances the prerequisites for efficient implementation.

Despite extensive cooperation between various parties in the local government, planning has no positive impact unless combined with active communication and cooperation between politicians, citizens and business community. The SM comprises methods and tools that, initially, have primarily been tested in cross-discipline city administration groups.

3. Formulate a schedule and work plan

A key element in the philosophy underlying the work method, which was introduced in the SM, is avoidance of a linear approach. It is not necessary for each component in a step to be completed prior to commencing the next step. Naturally, a logical, step-by-step process is advantageous to a certain degree. However, advantages exist in working through several stages concurrently to gain a compiled, if somewhat rough, basis for discussion of the main features in the planning.



Aiming for a cyclic planning process in which the various elements are dealt with in several rounds – first roughly, then more in depth and finally in detail – delivers several advantages.

1. Work planning
2. Integration of sustainability issues in comprehensive planning
3. Integration of energy issues for heating and transport in comprehensive planning
4. Design of implementation and follow-up strategies

One advantage of this approach is that problems and key issues become visible at a general level without being obscured by detail. It is crucial that the overall vision is ready before work starts on the details. Early development of overall, alternative future visions provides a clearer perception of the preconditions and key issues that need further investigation – and that are most relevant to the continued development and evaluation of the alternatives.

4. Work in a workshop format – establish a forum for dialogue

A communicative approach is fundamental to the development of internal dialogue between the various municipal departments and to the development of planning in cooperation with politicians, citizens and commerce. Workshops constitute a favourable work format with a deliberate interplay between the communication of knowledge and own applications or exercises. The participants analyse the preconditions for planning, formulate key issues and targets and draw up and evaluate future visions, as well as proposing strategies for implementation and follow-up. The aim is to find informal, creative, development-oriented and enjoyable work methods. Social activities in the form of dinners and walking tours allow informal contacts to be created while detailed knowledge of the municipality's history and current planning issues is passed on.

The approach can also be applied by switching between highlighting issues in a specific municipal department and cross-sectoral groups, respectively. It has proved advantageous to engage an external workshop manager who is not directly involved in – or who has own interests in – the municipality's internal work to avoid deadlocks and to ensure that the process flows smoothly.

In addition to process management, the efficiency of the work method requires consideration to be given to the size of the groups, the number of participants and the type of premises. It is also crucial that the process is documented and to plan how the work will be followed up in daily operations and in new workshops. Therefore, a workshop should be planned for the planning project in the overall schedule and work plan. Workshops constitute a favourable work format with a deliberate interplay between the communication of knowledge and own applications or exercises.

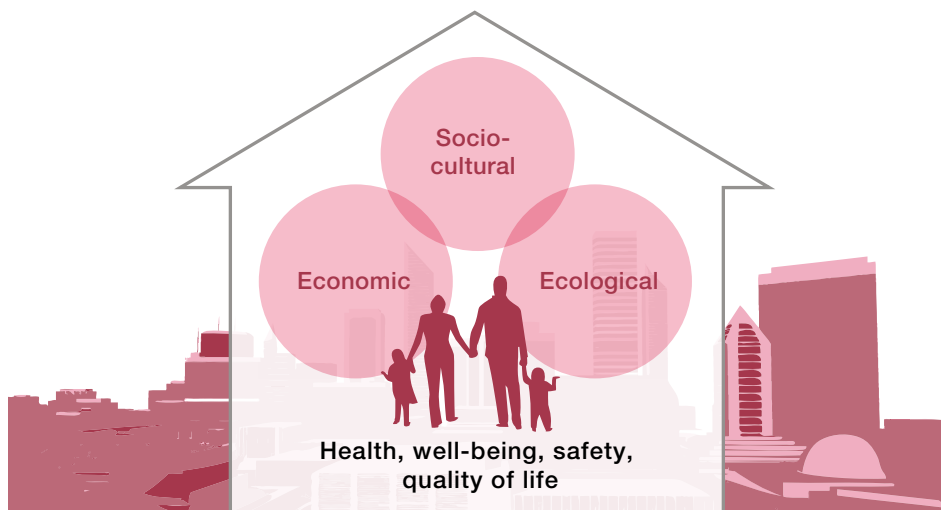
“Generally, the method has triggered an important process that has contributed to new cross-sectoral approaches in the municipality. This has led to broad political support for the work on comprehensive planning and the development of the existing structures. Work on a new strategic comprehensive plan has commenced.”

Västervik municipality

2 Integrate sustainability issues into comprehensive planning

5. Develop a local interpretation of sustainability

The term “sustainable development” had a substantial breakthrough following the Brundtland Report in 1987 when the principle of inter-generational equity was introduced. Development is sustainable if it meets the needs of the present without compromising the ability of future generations to meet their own needs. Since then, multiple concepts have been launched with more or less extensive claims of representing the truth. A classification based on ecological, sociocultural and economic sustainability recurs and a tendency exists for specialised professions (for example, ecologists, urban sociologists and urban economists) to attempt to define their respective areas in great detail. This risks losing the crucial overall perspective since reality always comprises an intricate interrelation between the various sustainability measurements.



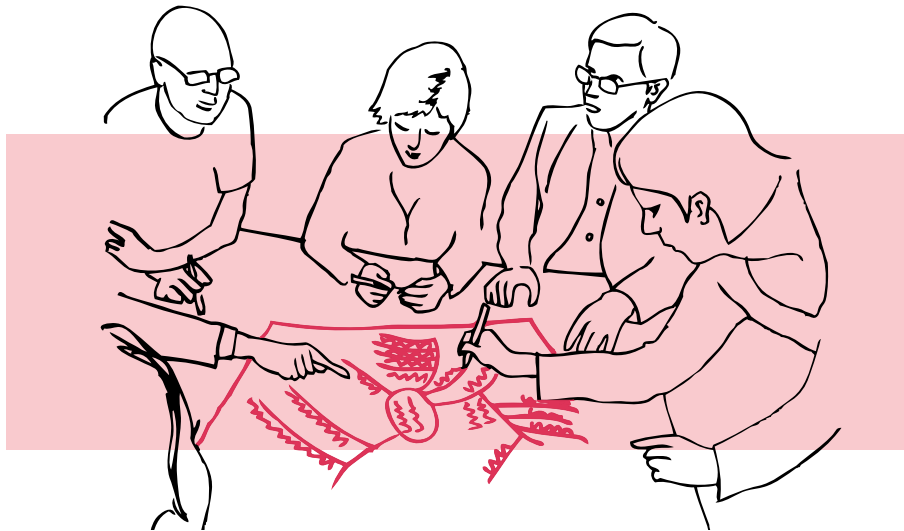
An overall concept for sustainable urban development. The SM emphasises the importance of balancing the ecological, sociocultural and economic aspects of sustainable development and working with these based on a spatial perspective keeping humanity in focus..

As part of the SM, consideration has been given to the need to describe the spatial dimension and its relation to other dimensions and private individuals. One key conclusion is that it is not possible to unambiguously define sustainability at a general level without the need for local interpretations of the term for it to have real meaning for the people affected and for it to impact urban planning.

Accordingly, it is important to attempt to develop local interpretations of sustainability that are relevant for the actual municipality and the actual planning assignment, early in the planning phase. This is also a method for initiating the planning and linking it to the general preconditions. Inspiration can be gained from the overall, research-based definitions. In addition, the approach matches the view that there is no single clear answer to sustainable development; in fact, it forms the basis for continuous on-going dialogue and processes that require work, compromises and a will to effect change.

Stimulate the thought process with mind mapping

The mind mapping tool has been introduced to stimulate the thought processes with regard to sustainability and to objectify its content and significance for local planning. The tool is based on keywords that are identified and structured in a visual manner. The core term to be analysed is placed at the centre and keywords are then grouped around the term. Even if the tool has the potential to liberate the mind and enable visualisation, the difficulties involved must be kept in mind. At its core, it comes down to defining the concept so that nuances are not lost. This enables awareness of the difficulties and the translation of difficult terms to a practical level.



Examples of local interpretations of sustainable development produced with the aid of mind mapping at a cross-sectoral workshop.

“Work on a local definition of sustainability was integrated into the on-going work on the vision for Västervik municipality for 2025. Under the leadership of a cross-sectoral group from the municipality’s sustainability network, we worked in a number of separate teams to develop the term –networks for sustainable development and urban planning, and project and steering groups for comprehensive planning as well as the executive management group and all the heads of municipal departments. When combined with mind mapping, it was a useful method to get everyone on board and to structure discussions to produce a joint local definition of what we mean by sustainability.”

Västervik municipality

“A good method to start with to create a sense of participation. A good method of inviting the other sectors/municipal departments that normally would not be part of planning.”

Härnäs municipality

“The method was tested on our colleagues with interesting results as it became apparent that sustainability had a multitude of varying interpretations for different people.”

Österåker municipality

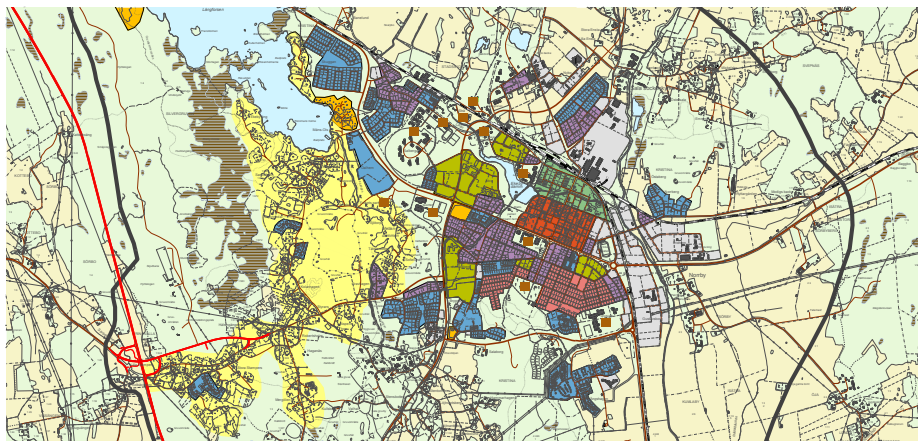
6. Prepare an external and internal conditions analysis for selected planning area

The spatial planning for an entire region, a municipality, a city district or an individual block depends on the interaction between factors in the world at large and the actual site (external and internal factors). An external conditions analysis in urban planning is needed to document key economic, social, ecological and spatial driving forces to demonstrate both opportunities and threats. A clear external tendency with a strong impact on urban planning and energy consumption is the continuing regional expansion, which is resulting in increasingly fewer labour market regions and an increase in regional commuting.

In addition to the external conditions analysis, describing and analysing a given planning area is a fundamental element in all planning from various sustainability aspects, whether it pertains to the municipality as a whole (comprehensive planning level), a city district (detailed comprehensive planning level) or one or more blocks (detailed development planning level).

Analyses can be performed as outlines or in detail. Normally, a survey of existing conditions is conducted corresponding to the accounting of public interest and national interest as required by specific laws. However, there is a risk that the descriptions of existing conditions will take energy from analyses and the creative work to develop alternatives and proposals.

Urban morphology analysis at workshops and in the detailed comprehensive plan. Sala municipality.



- Single-family city
- Single-family home area + linked house and row house, 1970–...
- Single-family home area 1940–1950
- Leisure homes and allotment-garden area
- Måns Olsvägen and Stampers
- Institutions and facilities

The internal conditions analysis is a way of strengthening understanding how spatial conditions interact with and influence ecological, economical and socio-cultural conditions, particularly energy issues for transport and heating. The analysis will provide opportunities to understand how the spatial structure interacts with housing developments and operations, green structures, traffic structures and technical supply systems, as well as increased regional commuting. The analysis will also provide the basis for developing future images and proposals that have a bearing on environmental, economic and socio-cultural aspects.

In an internal conditions analysis, both the city's attractiveness and its prerequisites for energy-efficiency enhancement are analysed; refer to Step 12. There are a large number of methods to highlight district characteristics from various perspectives.

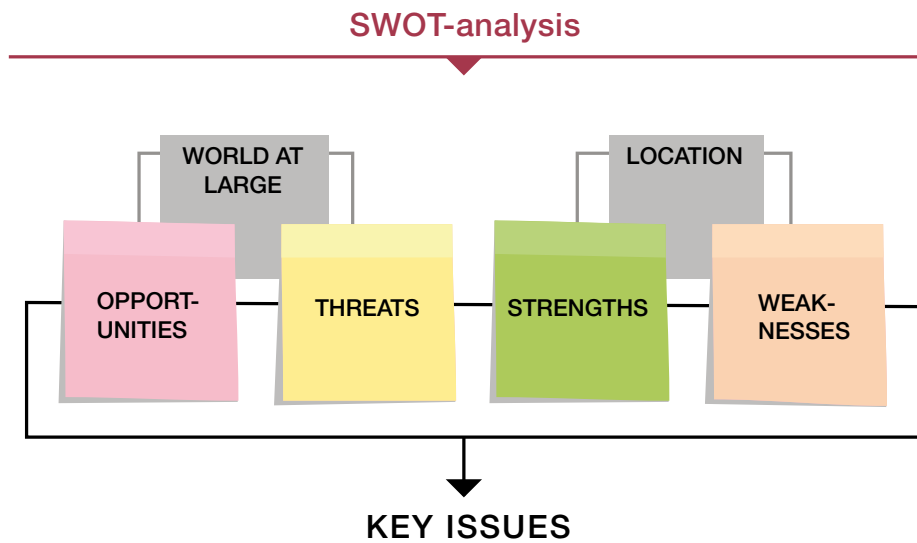
Combine different methods for best results

It is often necessary to combine different methods. The SM was the start of the urban morphology, which originated in the analysis of historic city characteristics. The type-morphological method is based on the assumption that urban form, rather than function, forms the type. It can be used to describe existing urban structures and growth rings but also to typify planned and discussed supplements in the form of new city districts. Issues such as development density/degree of exploitation, developed proportion of the land area and the number of floors are key elements in classification. The analysis of city and district characteristics may be combined with descriptions of the attractiveness of locations; for example, using methods and tools introduced by Jane Jacobs, Kevin Lynch or Jan Gehl.

A practical way to use the city and district type analysis is presented in the Swedish Transport Administration's handbook, *Traffic for an Attractive Town*, (TRAST), which is based on various types of cities linked to key prerequisites for large scale or small scale, such as forms of ownership. The idea is that the analysis will facilitate integrated development and traffic planning. The building regulations applicable in Stockholm show how the type morphology can be applied in practice to characterise the growth rings of a city – to avoid a random zone approach.

The type morphology must be supplemented with an analysis of relationships between the various sections of society. Space Syntax and Place Syntax are two tools that are attracting increasing attention in analysing how the urban format affects bicycle and pedestrian movements as well as other city qualities, such as accessibility to green areas and water, urban operations and public transport. By measuring the total number of objective changes using what are known as axial lines (visibility fields) in movement through a city or district, a collected image is provided of the degree of integration between different sections of the city.

The above methods and tools may be combined with a simple but broad and well-known tool, such as a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis. A SWOT analysis could contribute to generating commitment to discussing the strengths and weaknesses of a location where planning is in progress, and the threats and opportunities in the business surroundings. In the SM, there are several good examples of how SWOT analysis has been used to initiate broad processes among citizens and community associations – but also among public officials and experts. There are also excellent examples of how an analysis of city and district characteristics have provided the foundation for conducting an evaluation of positive and negative aspects according to the SWOT model.



A SWOT analysis is a useful tool for conducting an external and internal conditions analysis.



Example of an urban morphology and SWOT analysis in various villages in Strängnäs municipality. The analysis may be useful in preparing the key issues of the plan.

“The SWOT analysis is useful to us. We have used it in the detailed comprehensive plan for Moheda. It provides an excellent current-status description. It utilises qualities in the particular site. We have gained an overview of what the aim should be and have clarified what we should focus on.”

Alvesta municipality

“It is important to choose relevant criteria in the SWOT analysis in order to have the correct assessment basis. A well-executed analysis should provide indications of objectives and suitable measures for achieving them.”

Strängnäs municipality

7. Formulate goals and key issues concerning sustainable development

The external and internal conditions analysis, which uses existing planning conditions as its point of departure, tends to result in extensive material whereby it is not always possible to see what is significant or less significant for the development of alternatives and solutions. Accordingly, a work step is required in which the planning objectives are stated in a concentrated manner without anticipating tangible proposals and solutions. The formulation of visions and targets for the planning process is basically the politicians’ task and in Sweden, goals are set for sustainable development and community planning at all levels – national, regional and local.

In the tangible daily planning, it is not always easy to directly develop alternative proposals and solutions based on targets. It is often easier to use the targets for consequence assessments of proposals for after-control. One way out of this dilemma is to find a limited number of key issues for the work on formulating alternative future images and proposals based on the business intelligence and site analysis. The key issues will supplement the targets and may be linked to these in the work process.

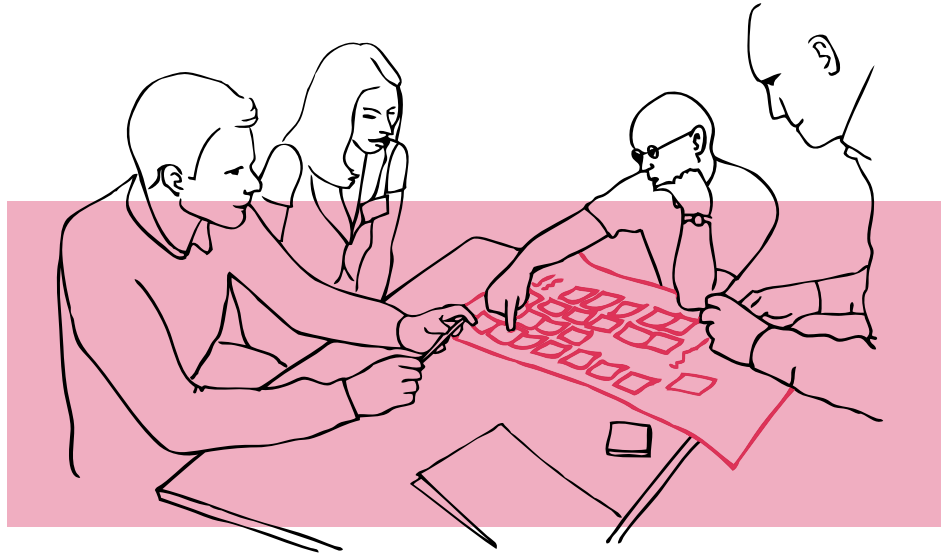
A key issue here may be defined as an important problem that must be tackled in the planning in order to utilise opportunities and qualities, as well as eliminating the threats and shortcomings listed in the analysis.

Prioritise key issues using the “post-it method”

The structured brainstorming tool, which can be used advantageously in the work step, is based on graphically visualising and structuring issues using post-its on a noticeboard. When the method is implemented in work groups, it is a good idea if participants, after an introduction of the method, begin by individually reflecting on what they view as the key issues in the current planning task.

It is beneficial if the group participants are kept up to date on the external and internal conditions analysis and the discussion on local definitions of sustainable development (see Steps 5 and 6). The key issues are written individually on post-its, which are posted on the noticeboard and then successively structured in various main groups of issues – a phase referred to as clustering. The group may then prioritise the key issues in the jointly prepared battery of questions by freely distributing a number of stickers between the various issues.

Finally, the post-its are distributed and ranked according to points on the notice-board. Experience shows that although the process will give rise to a large number of questions, it is often common to find five to ten questions that unite the entire group, as a basis for continued proposal work.



Identifying key issues by means of structured brainstorming, whereby the starting point is an implemented SWOT and city-type analysis (site analysis).

“This method makes it simple to conduct a rough analysis of the key issues since it is easy to use in large and small groups, as well as in trade groups or at general consultation meetings. Everyone will contribute and thus feel responsible for the results. We rapidly reach decisions on what should be prioritised, which results in us working on the right issues.”

Alvesta municipality

“The method has been a great help in structuring the problem and obtaining ideas on the issues that are prioritised by the local population and concerned stakeholders.”

Strängnäs municipality

“The method – if used correctly – will provide the opportunity for broad democracy and participation from a wide range of competencies and areas of interest when preparing the plan.”

Söderhamn municipality

8. Develop future images (spatial scenarios) for the planning area

The first and second-generation comprehensive plans were frequently biased with respect to documentation and inventory of existing conditions combined with recommendations and guidelines for individual sub-areas. Due to the intensified sustainability and climate debate, this included a need for a long-term perspective in community planning has been expressed. Our responsibility for future generations means that we must try to look at developments not only in a 30-50-year perspective, but even longer.

Important studies that have inspired the view of community planning as a future study effort and not as a comprehensive inventory effort include the Swedish National Board of Housing, Building and Planning's vision for Sweden 2009 (early 1990s) and the Swedish Environmental Protection Agency's future study Sweden 2021 (late 1990s). Despite being a few years old, these studies are still interesting from a method perspective.

There are at least three more or less streamlined approaches for working on future surveys that are also relevant to urban planning:

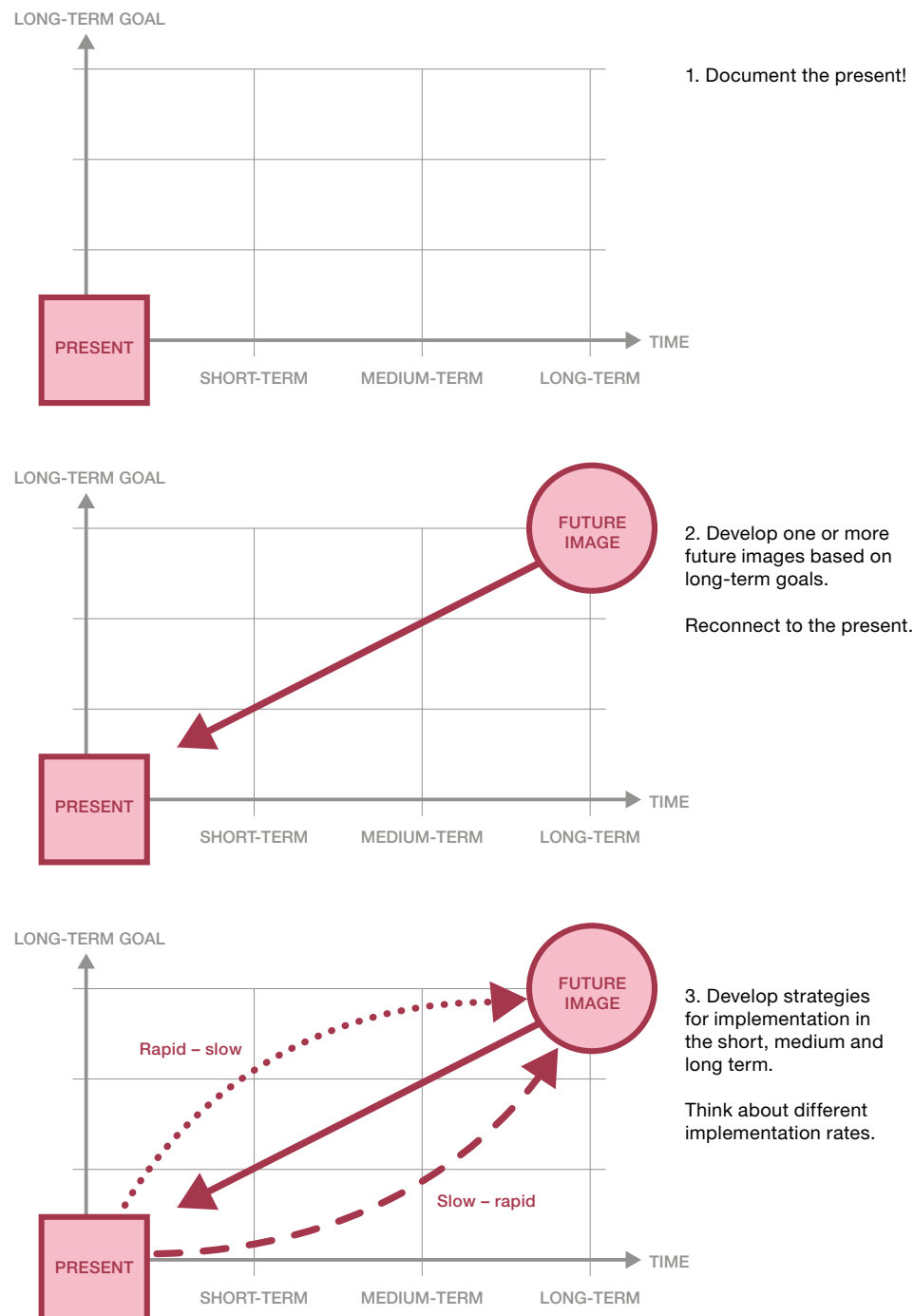
- The prediction approach is a deterministic approach whereby existing development tendencies are projected on the future. This methodology has resulted in a forecast approach, which is still the most common method for future assessments.
- The possibility approach is a behaviour method that is more open to various alternatives. The approach has resulted in scenario planning, which when applied strictly may be seen as an advanced method.
- The vision approach entails envisaging how society or a certain operation could be designed better than today.

Use back-casting to find “hidden” solutions

Back-casting is a method that is compatible with the two latter approaches – scenario planning and the vision approach. Instead of making projections of the future on the basis of the present, work should be initiated according to the back-casting method with a sketching of future images displaying how solutions to a social problem may appear in the long term. It is important that the time horizon is placed so far in the future as to allow qualitative changes to occur. Avoiding being locked up in acute problems or current development tendencies could give rise to innovative “hidden” solutions. Targets and key issues constitute the starting point for developing future images. After deciding on the future images, possible alternative routes from the present to the future may be sketched.

Initially, back-casting was a method used in cross-sectional research groups. The back-casting method and tools were further developed within the SM into a qualitative work method pursuant to Swedish planning traditions, without sophisticated model simulations that are included in more stringent applications. Participation from all parties has been the lodestar in all workshops. In stringent applications, back-casting is connected to visionary future images but in the SM back-casting is combined with scenario planning.

Back-casting is a method that is usable for preparing visionary future images (spatial scenarios).



DEFINITIONS

Within the Sustainable Municipality programme, some common future planning terms are defined as follows:

1. Vision = desired future.
2. Scenario = possible future situation that depends on various external changes (possibility approach).
3. Forecast = projecting based on current trends (deterministic approach).
4. Future image = tangible, spatial scenario that is not stringently connected to a certain external situation.
5. Strategy = route to the goal/future image/scenario.
6. Utopia = a desired ideal that is unrealisable.
7. Dystopia = an inhumane, non-desired ideal (nightmare scenario).

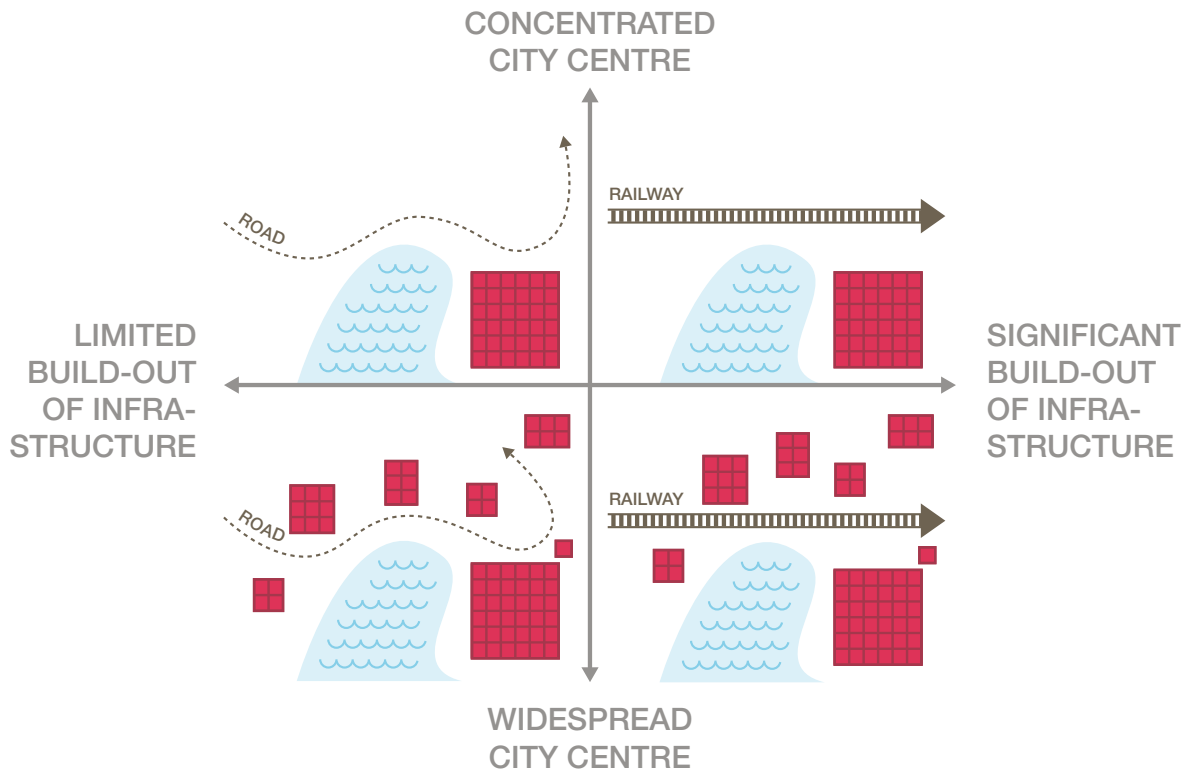
Difficulties in painting future images

In complex planning cases, it may be very difficult to create future images even if the targets are well defined. The strategic choice approach demonstrates opportunities to handle uncertainty in planning and is also a way to use key issues to generate future images. In Phase 2 of the SM, the scenario matrix tool was applied, which could constitute a special case in the strategic choice approach. This means that two key issues are selected that are significant to the spatial structure and are combined into compound alternatives in a four-field diagram.

Working “backwards” from the future to the present presents difficulties because it is very difficult to handle the uncertainty connected with long-term approaches. For this reason, it is obviously difficult to have a really long-term time perspective – as a rule, the time period is no longer than 15-20 years. Try to locate the axis in the scenario matrices based on your own analyses of key issues.

The following dimensions are often found to be relevant:

- Dense – average density – sparse.
- Rapid, average and slow population trend.
- Dispersed – multi-core – few-core structure.
- Centralisation of functions or supply systems versus decentralisation.



Example of scenario matrix/four-field diagram for the expansion of the development structure in Ulricehamn based on the scenarios' expanded/non-expanded infrastructure and concentration/spread of housing developments.

“Excellent strategic approach. Solutions that arise in conceivably extreme situations can also be used in normal cases – necessity is the mother of invention. This will kick start a creative process.”

Vingåker municipality

“Excellent method for describing various routes but also for counteracting earlier routes.”

Borås municipality

“Could be useful when faced with major strategic decisions, such as preparing a new comprehensive plan – at the workshop, we were trying to find a completely new location for the E4 Highway.”

Nyköping municipality

9. Evaluate future images from a sustainability perspective – ecologically, socially, economically and spatially

Although evaluation is only one part of the planning, it is such a central activity that it permeates all parts of the planning process. It is recommended that the process concerning consequence assessments – here, pertaining not only to the environmental perspective – is run in parallel with the decision process. Interaction between planning work and consequence assessments entails that earlier alternatives are deemed general and are used as the basis for continued advancement in a limited number of alternatives that will be reassessed. In this manner, sustainability issues may successively be integrated into the plans, which will become more difficult if the planning and design work has advanced too far. The cyclical and iterative planning process described in Step 3 will facilitate such integrated handling.

The need for continued development of practical methods and tools for evaluation and consequence assessment is great. Within the framework of the SM, several different evaluation tools have been introduced, tested and evaluated by the municipalities:

- Value roses for qualitative assessments, comparisons and ranking.
- Effect profiles for ranking alternatives.
- Multi-criteria analysis for more streamlined comparison of alternatives (MCA).
- Plan indicators for sustainable development combined with the above tools (refer to Step 4).

Since consequence assessments may become overly extensive written accounts supplemented with calculations, a need has arisen to graphically illustrate and summarise assessments primarily with respect to comparison and ranking of alternatives. In addition to the tools that were tested in the project, target fulfilment matrices may be used where the degree of fulfilment for various alternatives are reported and can be commented upon.

In all cases, it is necessary to place major emphasis on the aspects, indicators or criteria selected. Regardless of the tool used, the choice of aspects should be preceded by a dialogue between relevant actors in the municipality. Be careful when using standardised models in planning since the aspects vary a great deal from location to location – and between various planning situations.

Two methods that are different in principle can be used to divide these aspects:

1. On the basis of sustainability dimensions; for example, socio-cultural, economic, ecological and spatial or technical.
2. On the basis of issues that to a higher or lesser degree affect the various sustainability dimensions.

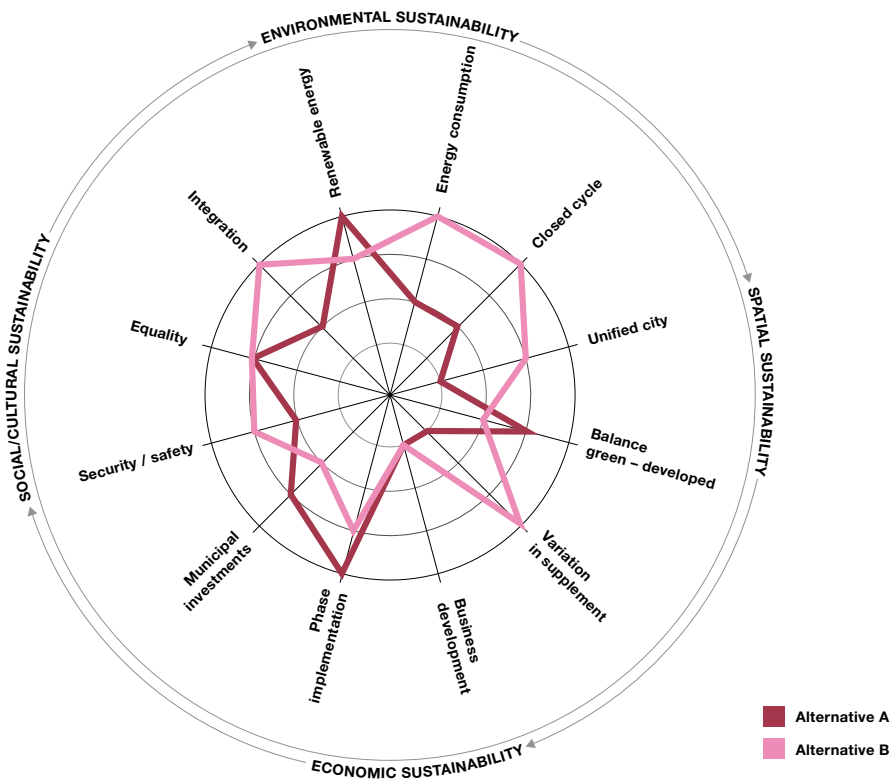
There are pros and cons with both methods. Alternative 1 is distinct through the clear feedback to the overall sustainability dimensions. The advantage of using Alternative 2 is that it leads to greater tangibility through recognisable aspects that clearly link to municipal planning goals. Using Alternative 2, it is possible to ensure the connection to the overall sustainability dimensions by making a target indicator matrix.

| | | RANKING | |
|---------------------|--------------------------|---------|---|
| | | 1 | 2 |
| Environmental | Energy consumption | A | B |
| | Renewable energy | B | A |
| | Closed cycle | B | A |
| Spatial | Unified city | B | A |
| | Balance green/developed | A | B |
| | Variation | B | A |
| Economic | Business development | A B | - |
| | Implementation by phases | A | B |
| | Municipal budget | A | B |
| Social/ Cultural | Safety | B | A |
| | Equality | A B | - |
| | Integration | B | A |

Ranking is a simpler form of evaluation whereby two or more alternatives are compared with each other based on a number of established criteria. For each sub-criterion, the proposal that is best, second best and third best, etc., will be ranked. In this example, only two alternatives are evaluated: A or B is best (1) or worse (2). For some criteria, it may be difficult to recognise any differences (business development and equality, in this example). The table does not show how much better or worse one alternative is compared with the other.

Illustrate target fulfilment using the value rose

The value rose may be referred to as a simplified form of the multi-criteria analysis that may be used to graphically illustrate the actual target fulfilment (quantitative assessment) of various alternatives or based on a qualitative scale. The model was originally developed in the UK and the US and is referred to there as radar charts, spider charts or star charts.



The value rose visualises strong and weak sides in various alternatives. Here, the degree to which one alternative is better or worse than the other is shown connected to various criteria. The further out on the axis, the higher the value. The scale may be graded or ungraded.

Effect and ranking profiles may be regarded as a value rose that has been straightened out to form a table. This works better than the value rose when a large number of aspects are to be addressed, although it is advantageous if the total number is limited. In the SM, the effect and ranking profile is also used for ranking spatial scenarios regarding energy and transport.

Weighted indicators in a multi-criteria analysis

The multi-criteria analysis (MCA) is a collective term for various systematic methods for analysing and weighing the effects of various alternative proposals, which are then used as support for decision makers.

| MAIN CRITERIA | SUB-CRITERIA | WEIGHT | ALTERNATIVE A | | ALTERNATIVE B | |
|-----------------|--------------------------|--------|---------------|-----------------|---------------|-----------------|
| | | | Points | Weight x points | Points | Weight x points |
| Environmental | Energy consumption | 5 | 5 | 25 | 4 | 20 |
| | Renewable energy | 5 | 3 | 15 | 5 | 25 |
| | Closed cycle | 2 | 3 | 6 | 4 | 8 |
| Spatial | Unified city | 3 | 2 | 6 | 4 | 12 |
| | Balance green/developed | 2 | 4 | 8 | 3 | 6 |
| | Variation | 2 | 2 | 4 | 5 | 10 |
| Economic | Business development | 2 | 2 | 4 | 2 | 4 |
| | Implementation by phases | 2 | 5 | 10 | 4 | 8 |
| | Municipal budget | 4 | 4 | 16 | 3 | 12 |
| Social/Cultural | Safety | 3 | 3 | 9 | 4 | 12 |
| | Equality | 3 | 4 | 12 | 4 | 12 |
| | Integration | 5 | 3 | 15 | 5 | 25 |
| Total | | | | 130 | | 154 |

The multi-criteria analysis facilitates advanced evaluation and comparison of various alternatives. The principal sub-criteria receive higher points than other criteria. The weight is multiplied by the points for each alternative = weighted points. The total of the weighted points shows the total points for each alternative, in this case 130 points for Alternative A and 154 points for Alternative B. In this instance, the MCA results indicate that Alternative B is preferable to Alternative A. The results can also be visualised graphically in a value rose.

The MCA work process varies but essentially links to the general procedure introduced within the SM:

- Identifying goals and key issues (compare with Step 7).
- Identifying alternatives and future images (compare with Step 8).
- Identifying criteria.
- Analysis and points for alternatives.
- Weighting of selected criteria.
- Total of weight x points.
- Evaluation of results.

The difference between MCA and other evaluation methods is that various indicators are weighted in order to produce a more nuanced result than would have been possible using the simpler tools. There are two different weighting methods:

1. Ordinal weights express a relative ranking of effects. If there are four aspects, this means, for example, that the aspects are weighted internally in a four-grade scale of 4-1.
2. Cardinal weights entail that the weighting is more nuanced. For example, 100 weight points may be distributed between the four aspects; for example, in the following manner: 40-25-20-15.

The points are distributed to each of the alternatives assessed. Ordinal points can be awarded, for example, in ranking order – if it is a question of three alternatives, for example, on a 3-1 scale. Awarding cardinal points could create confusion since it pre-empted the weighting of the aspects. Since the MCA works with figure-based assessments comprising aspects that are more or less soft and difficult to compare (apples and pears), it is important to test various weightings to study whether the ranking of the alternatives should be retained or changed; a robustness analysis.

Value rose:

“A tool that provides a pedagogic result that is simple to demonstrate and understand compared with other planning projects.”

Söderhamn municipality

“It’s good that the tool presents a physical image of all the words.”

Härreda municipality

“The value rose may be used in assessments of various types of proposals and also with indicators other than sustainability issues. The tool is thus adaptable and flexible, which is a strength.”

Sala municipality

Multi-criteria analysis:

“Valuable tool in the evaluation of various alternatives. Demonstrates strengths and weaknesses.”

Nyköping municipality

10. Develop, present and visualise a selected future image for the planning area

Several municipalities have developed their own planning examples, supported by the tools described above. Different methods for visualising the plan and pedagogically presenting various steps, as well as the big picture, have been tested to facilitate dialogue with many actors.



In Västervik, focus was on three different scenarios for development in the municipality: the investment in the town of Västervik, defined rural investment, as well as the investment in development villages.

In the comprehensive plan, it was decided to proceed with a combined strategy based on utilising existing infrastructure (roads/railways, district heating centrals and the water supply and sewer system network) and the investment in development events at three levels (municipal centre, municipal district centre and major urban areas) along the highways in the municipality.



Specialisation and processing of the scenario for urban cities with well-developed regional infrastructure in Ulricehamn.

Illustration: PeGe Hillinge, Sweco architects.

3

Integrate energy issues for heating and transport in comprehensive planning

When an initial round of planning has been implemented according to Step 2, this will serve as an excellent basis for an additional round of planning to address energy issues in greater detail. These may then be connected more clearly to other sustainability issues, which will facilitate addressing any conflict items and provide opportunities to strengthen synergism with other aspects.

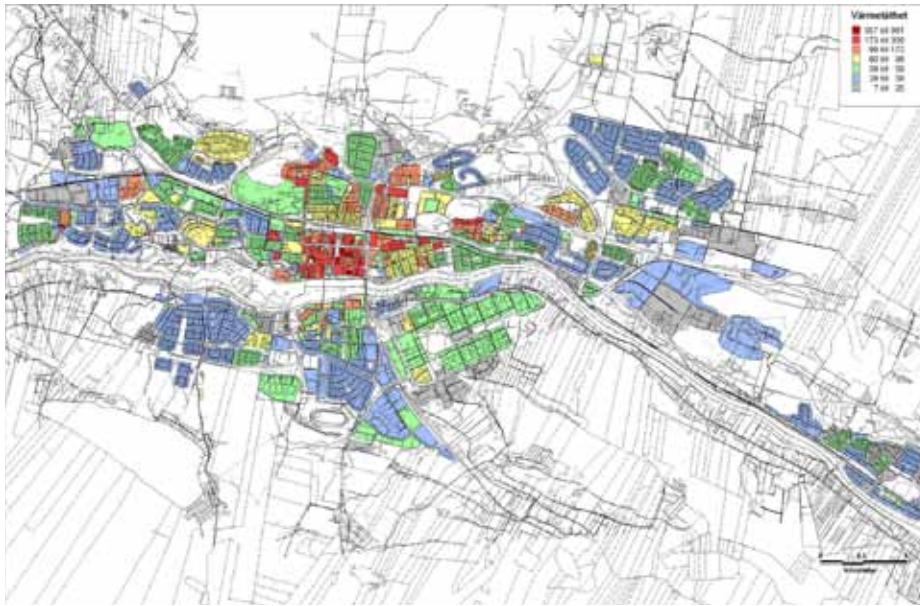
11. Conduct a detailed survey of energy and traffic systems including energy consumption

The external and internal conditions analysis will provide an overview of regional and local conditions and regional expansion, for example, will provide opportunities to translate commuting figures into energy terms.

With respect to the traffic system as a whole, detailed surveys may be performed according to the model that was launched in the Swedish Transport Administration's handbook, *Traffic in an Attractive Town* (which is currently available only in Swedish but an English summary will be printed in due course). The handbook includes advice, examples and checklists for examining the significance of energy efficiency and renewable energy supply. The analysis of regional conditions of the overall aspects of the entire traffic system, such as the city's character, travel and transport requirements (traffic flow) accessibility, security, traffic safety and the environmental impact. The handbook also addresses the interplay between types of traffic, such as pedestrian traffic, bicycle traffic, moped traffic, public transport including railway stations and major connection hubs, vehicle traffic, goods traffic in urban areas and emergency-services traffic.

An overview of the energy system for heating, cooling and electricity could include information on heat density in a heat-density map, which is one way of providing a clear image of the structure in the geographic distribution of heating requirements in a restricted area. The analysis according to the type-morphological method will provide an excellent starting point since $\text{heat density} = \text{development rate (gross area/land area)} \times \text{heating needs}$.

A survey could include the energy supply system in the form of production and distribution systems for heating and cooling in an energy supply document. The scope of the district heating and district cooling connected to various urban morphological types could be presented in such a document, as could local heating islands, meaning places where district heating, CHP and local heating facilities are located. Other systems that could be presented spatially are wind farms, facilities for geothermal energy and geothermal heat, solar-power facilities and wave power plants.



Examples of detailed planning documents for energy issues: heat density map in Skellefteå municipality. Source: Ranhagen and Ekelund (2004), image from Skellefteå municipality.

12. Document the microclimate and local environmental effects of heating/cooling/electricity and transport

The microclimate of a location is significant to the conditions for energy-efficient housing development. Review the potential to utilise renewable energy from sun and wind but also for the spreading of air pollution and noise generated by energy production, traffic flows and industries. The microclimate is also key to the sense of comfort. For example, high free-standing buildings generate strong wind movements, which are perceived as unpleasant compared with low and dense development, with sheltered zones and protected outdoor areas. This in turn is of importance to the vibrant city, since it affects the opportunities to utilise public areas and create attractive meeting places in the city.

13. Appreciate the potential for energy economisation and renewable supply

When there is an adequate picture of current planning conditions, it will be time to commence work on future changes and improvements. The following approach should be used:

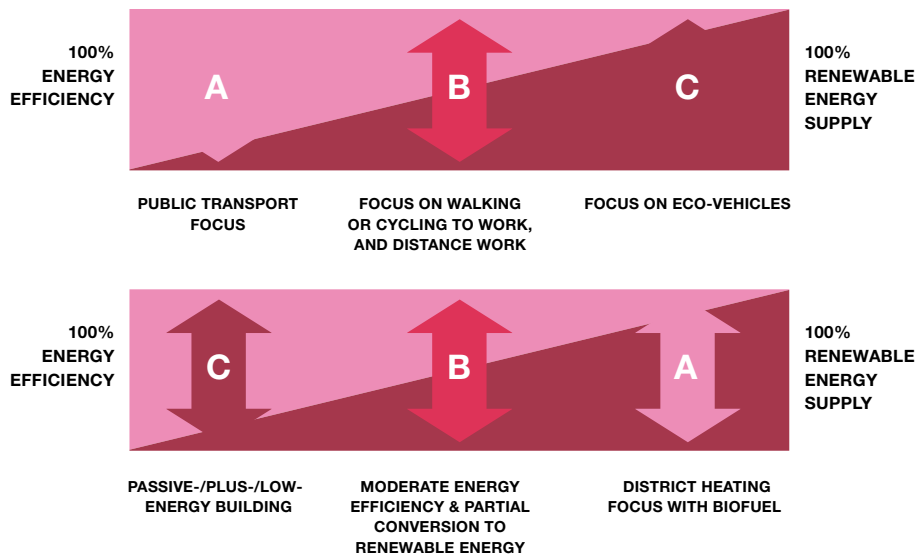
- Minimise the energy need for heating, cooling, electricity in housing developments and the energy requirement for transport.
- Maximise the proportion of renewable energy for the remaining needs connected to both housing developments and transport.
- Discuss how lifestyle factors, such as habits and attitudes, could affect energy requirements.

A tool that may be used to initiate a rough analysis of the current energy situation is the value rose. This entails an area of use other than that shown in Step 8. A five-grade scale can be used to indicate the current status and the desired and probable development. This has been used as a “soft,” qualitative tool as the basis for a discussion in a cross-sectional group. It is possible to grade the current situation and the potential based on energy-consumption figures.

14. Develop scenarios and future images for energy and transport

The back-casting approach to the preparation of scenarios and future images played a central role in the SM; refer to Step 8. In this step, work will advance using the future image(s) prepared in the first round of planning. A key fundamental approach is that definite solutions to energy issues in urban planning on the basis of pure technical-economic viewpoints should not be proposed in advance. Alternative scenarios must instead be formed and tested in a spatial environment, connected to social, ecological and economic aspects.

As the starting point of this work, three scenarios for heating, cooling, electricity and transport that are different in principle have been formulated. The scenarios can be viewed either as streamlined scenarios or peripheral scenarios to clarify the reach of possible alternatives and the differences that may exist between them; compare with Step 8. The scenarios for heating, cooling, electricity and transport may be combined as in the figure below but it is also possible to combine the scenarios in other ways.



Three alternative scenarios for transport and heating that are integrated in spatial future images (sketched plan proposal) and evaluated. Afterwards, there is the possibility to combine portions of the various scenarios into a processed proposal from which to continue work.

Alternative A entails focusing on major investments in public transport and focusing on the supply of renewable energy; Alternative B entails investments in improving conditions for pedestrians and cyclists and distance work, as well as moderate investments in both energy-efficiency enhancements and the supply of renewable energy; Alternative C entails major investments in eco-cars and energy-efficiency enhancements in housing developments.

15. Develop spatial future images with a focus on energy issues for heating/cooling/electricity and transport

In Step 15, the various scenarios are visualised in alternative, spatial future images for a given planning case. The starting point may lie in the future image that was prepared. It is very important that the work is conducted in cooperation with planners and traffic, energy and environmental experts, but also in broad cooperation with community associations and citizens. Expert support is also of importance to finding the correct focus for the future images.

If urban planning is to become a more forceful instrument for increasing energy efficiency and renewable energy supply, it is important to specify the action package connected to the various scenarios in the urban structure.

16. Evaluate and assess the consequences of the spatial future images

Similar to the general development of future images (refer to Step 2), it is important to evaluate these based on a number of agreed primary and secondary criteria (indicators). Within the SM, separate work was conducted to evaluate future images for heating, cooling, electricity and transport, but it is important to make a total appraisal in order to utilise synergism between these perspectives. Comparisons based on ranking using a ranking method or an effect profile could be a useful tool for arriving at a qualitative evaluation that will take into account ecological, socio-economical and spatial aspects. This is frequently better than the value rose in instances involving a large number of criteria.

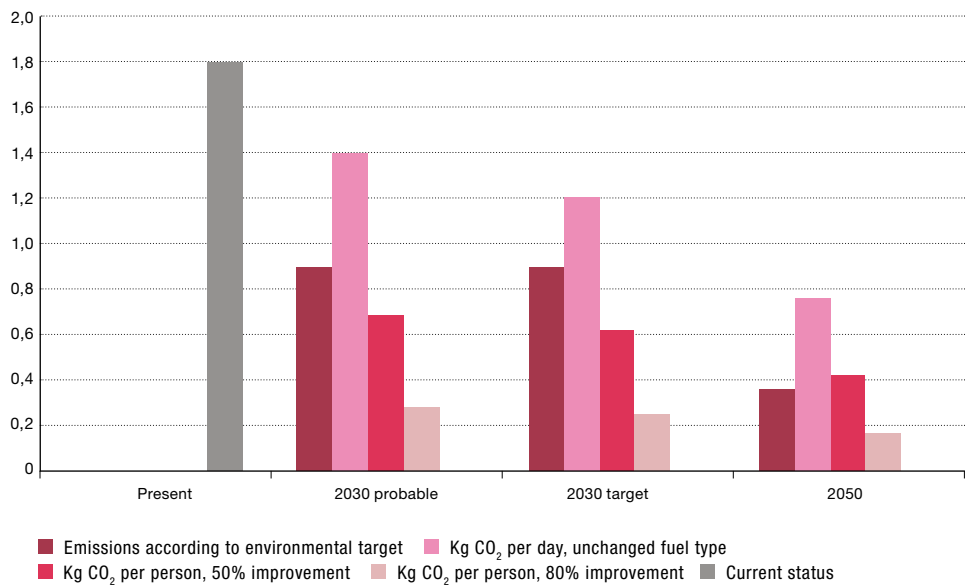
A quantitative evaluation of the future images is a solid complement that is able to demonstrate the consequences of the various alternatives. Within the framework of the SM, two tools for calculating energy consumption and carbon-dioxide emission have been developed and tested— EnScen and TranScen. Both models are outlined on page 34.

EnScen is a calculation model where the energy amount and carbon-dioxide emission connected to the heat supply of an area can be calculated based on the building areas, heat requirements and heating method. The model can be used to prepare diagrams of primary energy consumption and current emissions and when three different energy scenarios are applied in an existing or new area. EnScen is available in two versions, one for the areas with existing buildings and another for areas without existing buildings but with buildings that are to be constructed.



TranScen is a calculation model used to show how various spatial scenarios affect the development of transport in the form of energy consumption (fuel consumption) and total carbon-dioxide emission for each scenario. In the model, a number of key ratios are used; for example, to connect fuel consumption and emissions to various types of vehicles.

With TranScen, it is possible to model and show how various scenarios affect the transport sector's carbon dioxide emissions and compare this with various targets (for example, from Österåker municipality).





4 Formulate an implementation and monitoring strategy

When a proposed plan is being developed, it is important to concentrate not only on making the proposal itself sustainable and energy smart but also to consider the potential to implement the entire proposal or parts thereof. It is recommended to systematically document possible control measures at your disposal to facilitate smooth implementation. Both formal and informal control instruments may be used and combined. Meeting places must also be developed to stimulate dialogue when developing, implementing and monitoring proposed plans. .

17. Document hard and soft control measures for implementing planning measures

Housing development, green areas, infrastructure and operational patterns must be interwoven and the possibility to utilise and reuse existing land, existing buildings and other existing structures must be examined. The spatial structure is a necessity but it is in itself not a sufficient prerequisite to realise sustainability goals.

Various types of control measures are required to be able to implement the sustainability objectives – political, social, economic, institutional (organisational) and legal. Certain control measures are sharp instruments, such as legislation and limit values for energy consumption. Others are softer and more difficult to quantify, such as education, information and forms of cooperation. There are “hard” and “soft” control measures.

Plans as control measures

Control measures can be structured on various levels – global, European, national, regional and local. Of particular interest to the SM are plans used as control measures, which may also include political decisions, guidelines, programmes, agreements and financial incentives connected to the planning issues. Here, good forms of cooperation between various actors – such as, government and municipality or municipality, property owner and developers – are seen as soft control measures. The Swedish Board of Housing Building and Planning has compiled experiences on how comprehensive planning, detailed development planning, environmental assessment and environmental consequence description, as well as inter-municipal coordination and regional perspective can be used together with urban planning to reduce the community’s climate impact.

The municipalities’ “planning monopoly” entails that the municipalities have power and responsibility for planning and decisions concerning land and water consumption and development. The basis of the legislation in respect of environmental targets and energy supply/energy house-holding is found in the Planning and Building Act (the PBA), which since 2011 has had stronger formulations governing environmental and climate aspects.

The comprehensive plan, supplemented with necessary details (elaborated or detailed comprehensive plan), is the municipality's strategic tool to impact the development of the physical structure. The municipality will thus be able to handle opposing interests and generate an optimum balance between them. By developing overall goals, visions and future images of these plan levels, sector planning will also become better integrated into the overall picture in the form of, for example, climate strategies or sector plans for traffic, housing, energy and trade/service.

Although the comprehensive planning will not be legally binding, it will frequently have a strong controlling impact on the physical structure since it is prepared within a broad process of consultation. The Swedish Board of Housing Building and Planning has demonstrated that the comprehensive plan is often more significant in energy issues than the detailed development plan, since it affects the location of housing developments in relation to infrastructure. The detailed development plan is an important and necessary instrument for influencing energy issues in urban planning since it is a legally binding tool for realising the targets and intentions of the comprehensive plan. Pursuant to the PBA, the municipality is able to decide the extent of the development, location and design of the construction and land, and the size of the largest and smallest properties in the detailed development plan. However, a detailed development plan may not be more detailed than what is necessary for the purpose of the plan.

In the detailed development plan, the municipality may influence the development's energy consumption by regulating the building's location in terms of the microclimate, such as sun/shade, wind/protected and cold-air lakes/inversion. This means that Step 12 will weigh heavily in the planning. The municipalities are also able to influence the principal design of the buildings in terms of efficient building volumes (minimising surrounding areas in relation to building area, roof gradient with respect to sun exposure for solar cells and solar panels) and the size of the buildings and apartments.

In the detailed development plan, the municipality may also facilitate the implementation of energy systems deemed optimum in the overall energy and transport scenarios (refer to Step 3) by reserving land for district heating networks, district heating and local heating facilities or joint solar-power and solar-thermal facilities. In this connection, it is obvious that the detailed development plan must harmonise well with the comprehensive plan.

“The municipal planning monopoly is a key municipal tool that may be highly significant if the spatial structure being developed is to facilitate a reduction in the resource and carbon-dioxide efficient society rather than strengthening fossil dependency”

The Swedish climate strategy development, page 86

It is important to be aware of the energy-consumption issues in buildings that cannot be regulated in the detailed development plan. The following parameters affect energy consumption and climate impact:

- The buildings' energy performance (decided through the building regulations issued by the Swedish Board of Housing Building and Planning).
- Heating system (air/water/electricity).
- Energy supply (district heating, heat pump, pellets, oil, etc.).
- Behaviour/lifestyle.
- Technical design in addition to what is required by the location, for example, due to the environmental impact of noise.

Quite common that provisions in detailed development plans lack legal support

According to research conducted at KTH Royal Institute of Technology, detailed development plans are subject to the problem that they frequently include provisions that lack legal support. Provisions with no support in the PBA will be invalid. Decisions that are supported by such a provision will be annulled on appeal – regardless of whether the plan has gained legal force in other respects. An examination of the provisions stipulated in the detailed development plans of municipalities, where 390 detailed development plans in 25 municipalities established in 2006–2008, showed that:

- 30% of the municipalities have one or more provision that lacks legal support.
- 39% of the municipalities have one or more provisions that are unclear.
- 55% of the municipalities have one provision that lacks legal support or is unclear.

More stringent demands may be imposed on land owned by municipalities

A control measure that is currently attracting more interest is the use of legal implementation agreements, which, according to Kalbro (2008), fill a central function in building the social infrastructure by confirming agreements between municipalities and developers. These must be regarded as completely necessary instruments for implementing plans. There is a difference between preliminary land allocation agreements (where the municipality owns the land) and development agreements (where the developer owns the land). When the municipality owns the land, there are opportunities to impose more stringent demands than those existing in laws and directives by referring to sustainability and environmental programmes with local criteria and provisions.

With respect to land not owned by the municipality, the municipality, in its capacity as a planning authority, is unable to impose more stringent demands than what is stipulated in the law. According to researchers at KTH Royal Institute of Technology, the legal rules for development agreements are archaic and partly unclear since the conditions for the planning and construction process have changed radically over the past 20 years.

Within the SM, participating municipalities have concentrated on documenting ideas, through a workshop with structured brainstorming, for various control measures (soft and hard) with respect to politics, policies, programmes, plans (advisory and binding), agreements and financial incentives.



Workshop to generally analyse and prepare pros and cons of various control measures.

“It’s useful to structure the various control measures to allow everyone in the group to also see the elements that they are not working with/have as a priority. This is also a way of learning new methods to utilise and possibly for changing the work on the various control measures.”

Kil municipality

“For us, this area has been eagerly awaited. It’s ‘easy’ to be a visionary and talk about sustainable society but extremely difficult to know what tools we actually have at our disposal to achieve the targets and visions.”

Sala municipality

EXAMPLE VÄSTERVIK MUNICIPALITY

Inspired by the SM, Västervik has streamlined the targets in its energy efficiency strategy. These targets are the basis for developing control measures in the form of an Environmental Programme for Construction, which will be developed according to one of the objectives in the comprehensive plan.

In the detailed development plan for Stenhamra Trästad 2012, a sustainable and attractive city district is being planned adjacent to Västervik’s city centre. Modern timber construction technology will be used. The city district will function as a model for how the municipality will create sustainability in a wider perspective. It will also cooperate with other municipalities in the country in the Trästad 2012 project.

18. Develop forms of cooperation between various actors in all phases (the PBA+)

As stated in Step 17, it is often difficult to make a sharp distinction between hard and soft, or formal and informal control measures – as a rule, various combinations are involved. A highly significant prerequisite to achieve success in planning is well-functioning cooperation between various actors, as well as the opportunities to compile and coordinate various inputs.

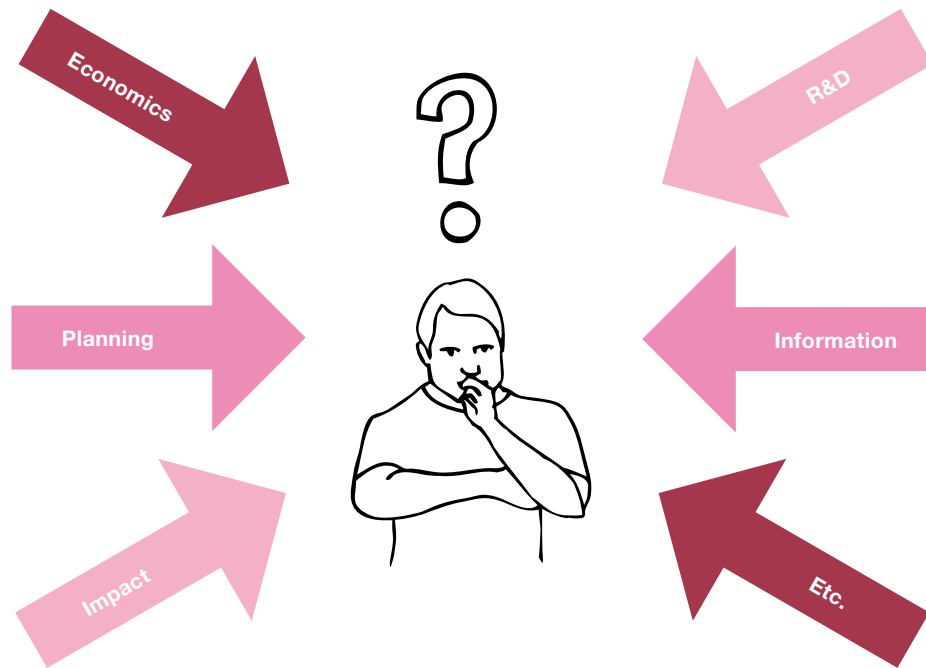
The municipalities cannot use legislation to force property owners to make changes in the existing property portfolio. The structures and processes in the Swedish Planning and Building (the PBA) Act may be used to work more aggressively on energy issues and also other sustainability issues – so-called the PBA-plus planning (the PBA+). This is a communicative approach to planning, compared with planning that mainly focuses on formal documents and decisions. In this manner, the municipality will be able to actively build cooperation with, for example, energy companies and property owners to jointly reach a consensus and create innovative solutions and processes.

The PBA+ entails that in addition to hardware – the physical structure and technical solutions – software is included, such as the expertise, approach, attitudes, choices and behaviour of people with respect to energy consumption and climate impact. Inspiration is available from mobility management, which pertains to traffic issues, but the approach may be expanded to also include other sustainability issues, such as Urban Sustainability Management.

The PBA stipulates that in traditional urban planning the focus is on the municipality's role as being responsible for regulations. In the PBA+ planning, the dialogue and forms of consultation for the PBA process are utilised as an arena or a forum for participation, influence and information (give and take) from a number of different actors.

Advantages of the PBA+

One advantage of this planning philosophy is that all of the issue owners concerned are involved from the beginning and participate in all process phases. Participation becomes broad, thus contributing to transparent planning – rational and communicative planning forms and planning tools may be combined creatively. Another advantage is that the implementation and monitoring perspective is included early in the planning and hardware (physical structures and technical solutions) and software (behaviour and lifestyle) are handled jointly. Using this planning philosophy, the municipality's expert resources, in addition to the urban planners, will gain a more active role as support resource for the property owners and the general public – energy and climate advisors, procurement experts, pedagogues, property experts in social issues.



The PBA+ approach entails harder and softer control measures –carrots and sticks – combined to reach further in efforts to achieve sustainable development and energy systems.
Arrows: Impact is changed to Behaviour impact

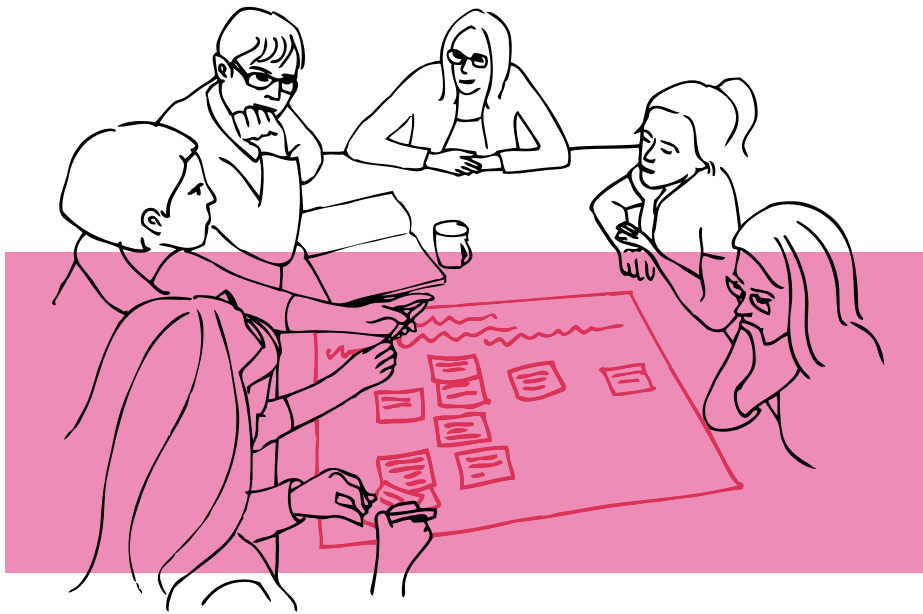
Develop forms of cooperation with workshops

In local workshops, municipalities may develop ideas for improved forms of cooperation in planning. Lectures on good examples from both the municipality concerned and elsewhere can provide participants with input for their joint development work.

Below are examples of two different types of cooperation situations that can be discussed in small groups:

1. Cooperation between the government in the form of the Swedish Transport Administration and the various municipality administrations, but also regional committees with respect to road and railway projects.
2. Cooperation between the various municipal administrations, land and property owners and developers concerning construction projects (blocks, areas or city districts) with the objective of generating energy-efficient housing developments.

In both instances, participation from citizens and local associations was also affected, but the focal point in the discussion was cooperation between the principal actors. Step 19 describes how citizen dialogues will be facilitated.



Discussion of improved forms of cooperation between municipalities and private developers.

“The need for an innovative approach and to dissolve hierarchical organisations is crucial in order to achieve changes in energy issues. In the group, various possibilities and limits with this work were highlighted and excellent examples of successful cooperation were discussed.”

Sala municipality

“Within the framework of a new organisation, where a new department or main process ‘Environment and Urban Development will be responsible for the overall strategic planning process in the municipality and its companies, there is major potential, based on coordinated control documents (climate plan, comprehensive plan and traffic plan) to work according to the PBA+ and the EU’s NNE strategy (near zero energy building).”

Eskilstuna municipality

One example of control measures in various phases, in addition to national targets and laws (the PBA+). Västervik municipality has further developed the workshop's concept concerning cooperation in all phases of the process.

| CONTROL MEASURES - In addition to national targets and laws | ANALYSES | | | |
|--|---|---|---|---|
| | EARLY PHASE | LATE PHASE | IMPLEMENTATION | ADMINISTRATION |
| Administrative (plans/policies/programmes etc.) | <ul style="list-style-type: none"> - National vision documents - Local environmental targets - Energy and climate strategy - Traffic strategy - Climate adaptation programme | <ul style="list-style-type: none"> - Development plans - Energy and climate strategy | <ul style="list-style-type: none"> - National Housing Board's construction regulations - Energy and efficiency enhancing strategy | <ul style="list-style-type: none"> - Sustainability accounts: follow-up - Environmental control |
| Agreement | <ul style="list-style-type: none"> - Regional public transport - KLT Transport company - Procurement | <ul style="list-style-type: none"> - Letter of intent municipality + developer - Procurement | <ul style="list-style-type: none"> - Development agreement and preliminary land agreement - Procurement | <ul style="list-style-type: none"> - Procurement |
| Cooperation | <ul style="list-style-type: none"> - Regional Development plan - No oil project - Kalmar County - Sustainable municipality - Project WoodCity 2012 | <ul style="list-style-type: none"> - Sustainability consequence analyses - Environmental requirement assessment | <ul style="list-style-type: none"> - Construction permit - Dialogue and advice | <ul style="list-style-type: none"> - Climate Investment Programme and Local Investment Programme project - Climate campaign, attitude and behaviour |
| Arenas | <ul style="list-style-type: none"> - In-depth citizen dialogue about Sustainability and Planning targets in the comprehensive plan - Network urban planning - Sustainability network | <ul style="list-style-type: none"> - Cooperation/Display | <ul style="list-style-type: none"> - Energy and climate advice | <ul style="list-style-type: none"> - Energy and climate advice |
| Other | <ul style="list-style-type: none"> - Create sustainability | <ul style="list-style-type: none"> - Architecture competition | | <ul style="list-style-type: none"> - Demonstrate good examples |

19. Develop physical and digital arenas for planning, experience feedback and follow-ups

During the pilot phase of the SM, only physical arenas were used. Phase two also included digital arenas for strengthening the actor's dialogue with citizens. The digital arenas are necessary considering the increasing significance of digital media. The arena approach should be used throughout the implementation process and to monitor and continuously improve the environment during the entire lifetime of the area.

The starting point for developing arenas for good discussions is that they must be used to capitalise on and create innovations when working with sustainable city and district development in cooperation with all the actors concerned. A motto for working with the arenas could be *“we can't solve problems by using the same kind of thinking we used when we created them”* (Albert Einstein).

During an inventory of the project, the following arenas in Sweden appeared to be of interest:

- Stockholm at Large – in an old industrial building, which was converted into an exhibition and development centre, an aerial view of Stockholm was printed on a 1:500 scale. Various actors then had the opportunity to use the aerial photo to demonstrate problems (such as segregation) in the city but also the opportunities to develop the city through concentration, new green structures, locations for production of renewable energy (see photo below).
- GlasHus Ett in Hammarby Sjöstad, Stockholm. An educational building centrally located in a city district that is used to illustrate system solutions and processes for visitors, as a place for information, education for tenants and those working there.
- SolarCity in Malmö, a centre for introducing, testing and exposing solar energy systems, both solar cells and solar panels. The centre includes Sweden's largest PV system 1,250 square metres of solar panels in an apartment building.



Stockholm at Large at Färgfabriken in Stockholm is an example of a physical arena where the public and experts are invited to develop creative ideas about the city's sustainable development. Photographer: Camilla Wirseen.

In modern planning, it is not sufficient to work with physical arenas to reach the various groups of citizens, although our experience shows that physical meetings play a key and perhaps crucial role in generating good discussions and participation characterised by quality. The digital media could be used to activate the dialogue and attract people to the physical meetings.

The advantage of digital media is that participation can occur at any time and involve several groups, which may have difficulty in moving about. Dialogues in networks may be created but a critical point is how the information flows can contribute to actual dialogues and to the collective syntheses based on the ideas of many. One experience is that digital media may be viewed as a complement to the physical meetings and dialogues.

Form discussions and idea groups

In the project Digital platforms for social building (SWECO/White in cooperation with Social Square), an Internet portal was used to facilitate dialogues on a large number of plans and areas in Malmö. The portal offers opportunities to present ideas for how the city should look, and the city's most current plans were presented. Discussion and idea groups may be formed based on various themes, such as buildings on pillars, inner courtyards and "plus buildings". Invitations to exhibitions, consultation meetings and other activities are presented. There are an unlimited number of opportunities to stimulate dialogue and to transfer information within various themes.

An additional example is in the Skanderborg municipality in Denmark. A digital platform was developed there for comprehensive planning work. Citizens contribute ideas, which are displayed. The ideas can be monitored during the management process (they do not disappear). Questions and answers are updated successively. Visit: www.ideoffensiv.dk

"The need to develop a communication arena in Västervik is considerable. The exhibitions held in the library are beginning to become old-fashioned – new forms are needed. Cooperation with schools is promising. Within the framework of the learning for sustainable development process, schools and preschools have worked on various projects involving energy, climate, transport and sustainability in a broader perspective. This resulted in an exhibition at the museum and Naturum visitors' centre in Västervik."

Västervik municipality

"The further development of the arena concept is a great exercise to perform in a group of varying ages. This will generate understanding of each other's approach to various types of arenas."

Kil municipality

20. Develop a model for implementing and monitoring the planning case

The discussion about the needs and benefits of developing and applying various systems and tools to monitor qualities in city districts and cities that are both measurable and difficult to measure has intensified. In the past, development projects have been conducted in Sweden concerning target and planning indicators as a tool in urban planning. In the joint EU-financed development project managed by the Swedish Board of Housing Building and Planning and the Swedish Environmental Protection Agency in cooperation with several Swedish municipalities and County Administrative Boards at the end of the 1990s, the terms planning indicator and measuring and field indicator were launched as a tool for environmental assessments and monitoring developed environments. The starting point was the 15 environmental quality goals, which are currently 16.

In a subsequent development project, the issue of indicators connected to two government assignments for the Swedish Board of Housing Building and Planning was addressed. Within the framework of the environmental target effort, urban planning indicators were to be developed and, within the framework of the national development project The Good Dialogue, the commitment to the government to develop indicators for urban planning was to be fulfilled.

EXAMPLE OF METHODS FOR MEASURING QUALITY AT CITY DISTRICT LEVEL

LEED ND (Neighbourhood development) and BREEAM Communities are international systems intended to measure qualities at city-district level and are a type of sustainability assessment system. They are close to a type of voluntary environmental consequence description process with the developer as a driving force where the incentive is to achieve high total points.

The HCS Project – Sustainability certification of city districts – was initiated in spring 2010. The work was expanded successively and now includes a number of actors from organisations, departments, government offices, technical consultants, architects, researchers, developers and property owners. Primarily, the project aims to analyse BREEAM Communities, which have only been used in pilot projects in the UK in the past but are now being used for the major town-building projects Masthusen and Varvstaden in Västra Hamnen in Malmö. A key part of the project was to analyse how the system could be adapted to Swedish conditions and planning legislation.

FOLLOW-UP MODELS FOR ENVIRONMENTAL PROFILE AREAS

In Stockholm, a development effort concerning follow-up models connected to three environmental profile areas has been in progress for several years: Hammarby Sjöstad, the Royal Seaport and Järva. In Hammarby Sjöstad, the environmental programme (the first was adopted in 1996) stated that the city district's environmental performance should be twice as good as the level applicable for new production in the late 1990s. The focus was on closed cycles and a high proportion of renewable and locally produced energy. A detailed evaluation of Hammarby Sjöstad's environmental profile was performed by researchers at KTH Royal Institute of Technology. Some of the findings:

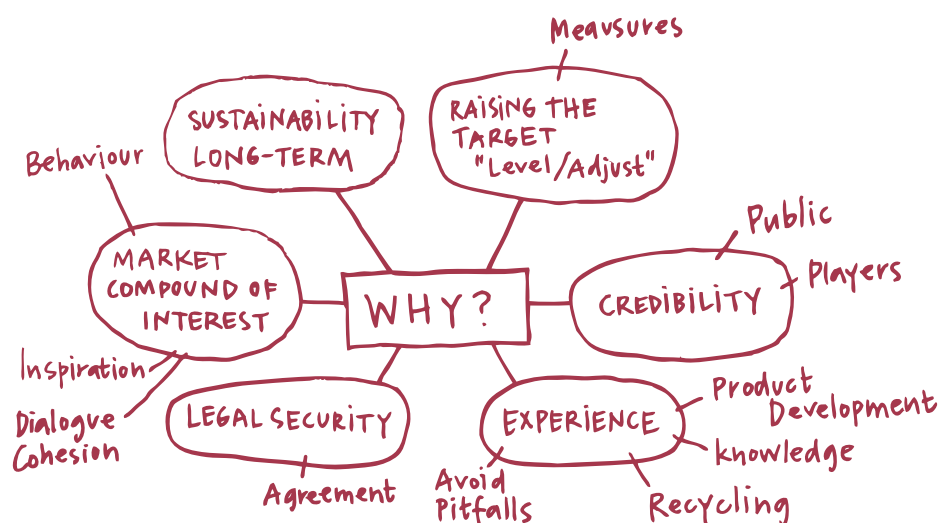
- The Hammarby model is an example of how cooperation can result in traditional municipal systems engineering and municipal planning being merged into a new method of organising energy supply in a city district.
- The strength of the vision is also its weakness. Due to the vision's holistic perspective, system solutions were prioritised. However, it was not as easy to relate to new technologies such as solar cells, solar panels, fuel cells and other new technology in the field of energy.
- The work on follow-up models for the Royal Seaport is continuing, with experiences from Hammarby Sjöstaden and from the international certification systems being used as a point of departure. The overall vision is that the Royal Seaport will be a world-class city district from an environmental viewpoint. The aim is that the city district, in a long-term perspective, will be climate positive and completely free from fossil fuel by 2030.

Workshop on the follow-up models

Work to develop follow-up models can be advantageously conducted in a dialogue-based workshop, where the following issues are addressed:

- What is the reason for the follow-up models?
- What are the relevant indicators in the various phases – planning, designing, implementation, administration/follow-up?
- How can work be organised to develop follow-up models?

Mind-mapping can be used as a tool for discussing the reasons. This could involve a broad spectrum of reasons; for example, to ensure that all issues are addressed, to drive and motivate actors to achieve better results, and to create good examples to function in marketing of sustainable and attractive city districts.



Mind-map from workshop together with reasons for developing follow-up models.

Relevant indicators may be revealed, based on a number of conceivable focus areas, by specifying indicators/criteria adapted to the various phases of the process. One example is availability of public transport:

- In the planning and design phase, a densely populated city is planned with a maximum of 300 metres to public-transport bus stops – agreements are signed between municipalities and county traffic.
- In the implementation phase, bus stops are constructed based on the demands, while the phases are designed to encourage buses to operate there – perhaps free public transport is possible in one of the phases?
- The operation phase involves measuring the number of passengers and relates the travel volumes to availability indicators.

Major complexity concerning follow-up

Finally, it is important to consider how the work to prepare follow-up models can be organised in cooperation with various actors. A recipe for an optimum organisation could be:

- Well-defined project order.
- Project management with distinct mandate.
- Correct competency and expertise, because follow-up models are genuine cross-sectional problems.

The issue of developing and applying follow-up models has many dimensions and there has been no scope in the project to delve deeper into this substantial problem. At the same time, the process could be started in the municipalities with the fundamental issues presented above. The experiences that already exist and that will arise successively in the national projects on sustainability and environmental assessment in plans and certification systems may subsequently be introduced into this platform and provide the work with a greater spread, support and precision. Hopefully, the SM will contribute to continuous improvement concerning the issue.

“To measure the results of the established goals, follow-up is a must since it is an important part of the quality and knowledge effort. The municipality should prepare indicators that can be followed up.”

Österåker municipality

“Since Västervik municipality has high ambitions to work with follow-ups, a sustainability account was developed several years ago – comprehensive for the municipality (environmental targets, public health targets, local economy). The most difficult aspect is to arrive at the right indicators – that actually say something about how things are developing. It would be interesting to follow up the objectives that were set in our comprehensive planning programme.”

Västervik municipality

Four follow-up tips:

1. At an early stage, formulate the items that are to be followed up to facilitate compilation of the current status. If no figures are available to compare, it will be impossible to evaluate the results of an action taken.
2. Find the right level for the follow-up with tangible follow-up goals – even if it is difficult.
3. Document the calculation process (in terms of measurable aspects) to allow others to redo the process in the future.
4. Help each other; this area is relatively new and many struggle with preparing follow-up models for sustainability. Share good examples!

The aim of the steps presented in the concept document is to utilise the unforeseen potential in the planning and in its processes. Eventually, it will be possible to find optimal system solutions for complex social problems. Consequently, the aim is to inspire positive development of processes connected to the planning area.

*Have fun!
Develop a fantastic dialogue
and creative communication that will lead to sustainable
and energy-efficient plans and societies.*

Our objective – smarter energy consumption

The Swedish Energy Agency is a government authority that focuses on a safe, environment-friendly and efficient energy system. Through international cooperation and commitment, we are able to contribute to achieving climate goals. The Agency funds research and development into new energy technology. We actively contribute support to business concepts and innovations that could lead to new companies. We also show Swedish households and companies the route to smarter energy consumption.



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