Policies in spatial planning and Urban Development

Кафедра «Городское строительство и хозяйство»

Лекционный курс

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Аннотация

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ОГЛАВЛЕНИЕ

UNIT 1. INTRODUCTION. URBANIZATION OF RUSSIA. NATIONAL PLANNING IN THE RUSSIA. PLANNING THEORY

Urbanization — the process of enhancing the role of cities in society development, increase of urban population compared to rural.

The obvious questions at the core of a study of Russian urbanization concern whether the system of severe population control mattered and, if so, how it affected urban growth and economic development. There were substantial controls during the Tsarist era, and these increased further in the Soviet epoch. These included the quasi-enslavement of serfdom, restrictions on regional residence and rights to live in cities by Jews and other minorities, banishment to remote areas for political or criminal offenses, and an internal passport system during the Tsarist era. The Soviet era was accompanied by even stronger controls and assignment of individuals to workplaces to meet industrial needs. Comparison with Poland indicates that Russia was less urbanized in the early 20th century but more urbanized by the end of the Soviet era. Differences in economic structure were central to this outcome, while population control mainly affected the distribution of city sizes rather than the overall urban population.

While Russia urbanized rapidly, it also was characterized by enormous variance during the Soviet era. Population is concentrated in the west and in temperate climates. This was true in 1897 and remained the case a century later. Population did spread east and south, but the fraction living in the far north was never large. Furthermore, there has been substantial return migration from remote cities since the collapse of the USSR, so that overall there is a modest re-concentration underway. Western Russia around Moscow and St Petersburg urbanized more rapidly than the remainder of the country during the Tsarist and early Soviet eras, but the differences in terms of percentage urban were never dramatic. Indeed, by the mid-Soviet era and thereafter, many other regions had a higher proportion of the population living in cities. This pattern reflects agricultural potential: historically, Russia has had many small scattered outpost cities in difficult climates or geographic areas without densely populated rural hinterlands. Rural population densities have been greatest in breadbasket regions southwest and southeast of Moscow.

The pattern of Russia’s demographic transition also has had a strong spatial component. Russia urbanized first in the central, northwest, and Ural industrial area, and then gradually expanded its densities and cities in a southeastward direction.

Internal migration was large and critically important to understanding urbanization in the Soviet era. More than half of all of Russians in the 1989 census had changed residence at least once, excluding intra-regional moves. This mobility was high by international standards, especially given the distances moved; as the following chapters indicate, it was also high by more recent Russian standards.

A striking feature of Russian urbanization, and one tied as well to the GPW, is the absolute depopulation of rural areas after 1926. Russia’s urbanization was so rapid in the 1930s, its population losses so great during the war, and its fertility decline so great relative to the urban labor demands created by industrialization from the 1950s onward, that rural populations went into long-run decline.

Fewer than 40 years accompanied faster growth of relatively large cities. Some of these new towns were in satellite areas of larger cities and ultimately were incorporated; others were not, but their presence ensured that the bottom tail of the distribution had many small towns and cities. Fitting the two pieces together is the nature of Soviet urban growth: cities were surrounded by countryside rather than suburbs, and agglomerations – large urbanized regions emoting from a central metropolitan area that came to encompass smaller cities – were alien to Russia, with the exception of Moscow and to a much lesser extent St Petersburg. This pattern in turn reflected both the emphasis on building cities to support manufacturing (placed in industrial belts just outside the centre of the main city) and constructing dense housing projects just beyond the industrial belt.

The relatively rapid growth of large cities and the primacy of Moscow and St Petersburg notwithstanding, a peculiar feature of Russia's city-size distribution is that it does not look particularly primate by international standards when the entire distribution of major cities is considered.

Housing in the USSR was not a priority until the ascendancy of Nikita S. Khruchshev as head of the CPSU in 1953 and his consolidation of power in the next few years. Between 1926 and 1950, 'net living' urban housing space (about 65 per cent of total, excluding entryways and such) per capita actually declined from 5.85 to 4.67m^2, an astonishingly low figure. A housing push was announced in 1957, and during the period 1956–65, housing construction occurred at a pace twice that of 1951–55, and net living space reached 7m^2 per person (and 10.0m^2 gross space). A crash programme naturally meant pre-fab materials, which in turn often meant poor assembly practices. The resulting khrushchevki apartments are renowned for their sameness (very few designs: the four- and five-storey brick buildings are instantly recognizable today) and unattractive living features (tiny rooms, wretched kitchens and bathrooms). In the years that followed, pre-fabrication continued to dominate, but the apartment buildings became taller, with brezhnevki typically reaching 9–15 storey's. Quality improved modestly but the drab sameness remained. Efforts to make large apartment units (massifs) distinct began in the 1980s, but structural quality was often even worse than before.

Although private enterprise was responsible for none of the apartment buildings or complexes that dominated Russian cities, there was private housing in Russia. As of 1928, private housing still accounted for 53 per cent of all urban housing space, though that share declined to 36.6 per cent in 1940. It continued to decline, though was encouraged to some extent in the 1950s (reaching 33.7 per cent of all new urban housing construction) before declining drastically thereafter (to 20.6 per cent in 1966). Yet, these figures are misleading: since no apartment complexes were privately owned, owner occupied housing was restricted to generally single-storey units in small towns and cities, or to similar units on the outskirts of large cities. They were encouraged mainly because of the space shortages and the unwillingness of individual enterprises, controlling ministries or the central government to devote more resources to housing – even during the boom housing construction years, the investment level was modest by Western standards.

The centre of cities was taken for administrative and public space. Immediately around or intertwined was housing stock that ended up serving the upper end of Soviet

society, the nomenklatura, consisting of CPSU party members and their families. In older cities, this housing came largely from pre-revolutionary stock and was generally of higher quality, but even central housing built in the Soviet eras tended to be nicer than that further out – though maintenance quality undoubtedly had a lot to do with this.

Beyond that, Soviet cities grew organically, much like trees. Since ring-roads were rare outside Moscow, and since most inter-city transportation was public and hence went through centrally located train and bus depots, Soviet cities had all of the preconditions for the monocentric model. However, in the absence of property markets, new or expanding enterprises simply acquired vacant or low-use land on the outskirts of the city in which planners had told them to produce. They used this land to build factories, with no concern for economizing on space use (subject to their overall land-allocation constraint), and used the remainder to build housing for workers and, in conjunction with local government, built amenities, schools, clinics and shops. This pattern resulted in a system in which land was rarely recycled to higher-value uses, in which industry and housing were interspersed to a degree rarely if ever found in modern market economies, and in which the edge of cities tended to consist of high-rise housing. Indeed, since newer housing had more stories than older housing, and since cities expanded outward as they grew, the highest-density housing was often at the periphery. Find that land that might have been valuable for housing adjacent to the centre is often dominated by industry.

Whereas the Soviet apartment clusters were virtually identical in structure and appearance (even if their interiors varied considerably, according to the occupant's social class) across the district's urbanized landscape, the modern suburban towers that now share streets with drab and dated «khrushchevki» are a clear marker of wealth differentials. This new commercial housing is often structured as mixed-use developments, with small street-level offices, dining or fitness services to be used by its residents.

Field observation while navigating through these high-rise buildings also confirms the physical and perceived inaccessibility of the new dwellings. Economy-class projects visited for the survey had physical structures that usually formed self-enclosed yards, which were accessible through an archway on either the main street or a side street.

Although some buildings were gated with three-meter fences and others had no such restrictions, the high level of security in virtually all new communities make them uninviting to random visitors.

Although Russia's modern up-scale real estate market has socially coded residential property into 'elite', 'business' and 'economy' classes in terms of their exclusivity, quality and prices, even the last type is unaffordable for the vast majority of local households.

Since neither new affordable dwellings nor mortgage systems are available to the local populations, it is likely that the poorer migrants from remote areas rent rooms in the apartments of old residents. This de facto growth of communal living has created what the locals call a 'town of contrasts', with oases of wealth amidst aging and cramped working-class communities.

Whereas most locals in relatively urbanized areas live in mass-produced housing with access to essential utilities and indoor plumbing, their rural counterparts reside in wooden 'barracks' with water wells and outhouses. Almost incredibly, areas located just

500 meters away from the big city have intermittent access to only a single modern utility, electricity. Many younger residents have left their villages, leaving a population of the marginal segments of Russian society.

The largely unregulated proliferation of modern suburban developments along with rapid population growth also has resulted in a shortage of social services and infrastructure. Planning for schools, polyclinics and daycare centers generally has meant increased use of existing public infrastructure in response to population growth. While promising either to pay for or to build new schools and kindergartens, developers tended to have finished their high-density apartment clusters without making contributions to the capacity of local services.

Among suburbanization's major effects on locals, the privatization of public space is perhaps the most insidious – while receiving minimal media attention. The quasilegal or downright illicit means by which powerful businesspeople acquire exclusive access to lakes, 'protected' forests/parks and sand quarries have damaged city rich endowments and public recreation options. Both rural and urban dwellers suffer from newcomers' takeover of lakes for use in gated communities, though rural residents tend to be closer to these natural resources and therefore use them more often.

In principle, the Putin Administration is committed to this expansion. However, there is no history in Russia of developing reasonably high-quality, good-access 'affordable housing', and the private sector has no incentive at present to develop the sub-econom market. Mortgage markets remain modest, interest rates are high, and the vast array of institutions and financial incentives and guarantees that have encouraged moderate-income housing in many advanced capitalist countries remain absent. If the present government is serious about developing these institutions, suburbanization and expanded housing stock can reach a broader population in Russia and elsewhere. Until then, it will continue to accentuate the difference between the professionals who comprise Russia's new 'middle class' and the remainder of the nation.

UNIT 2 STEPS IN PLANNING PROCESS. DEVELOPMENT GOALS AND OBJECTIVES

Planning is a means for preparing for action, and it occurs through a process in which:

1) information is collected and analyzed;

2) logical alternative courses of action are developed consistent with the goals of a constituency;

3) a course of action is recommended. Every project has its own set of parameters and dynamics and its own sequence of events.

Because each planning situation is unique, planners necessarily rely heavily on the process of planning. With an adequate process, the difficulties of planning can be surmounted over a period of time. The process of planning is comprised of a number of stages or phases. The phases are not necessarily followed in sequence in all cases, and recycling to an earlier phase is frequently necessary. The general nature of the process is presented in the following subsections.

The steps in the planning process may be described as follows:

- Identification of problem or need
- Data collection and analysis
- Development of goals and objectives
- Clarification and diagnosis of the problem or issues
- Identification of alternative solutions
- Analysis of alternatives
- Evaluation and recommendation of actions
- Development of implementation program
- Surveillance and monitoring

The planning process is shown graphically in Fig. 1.

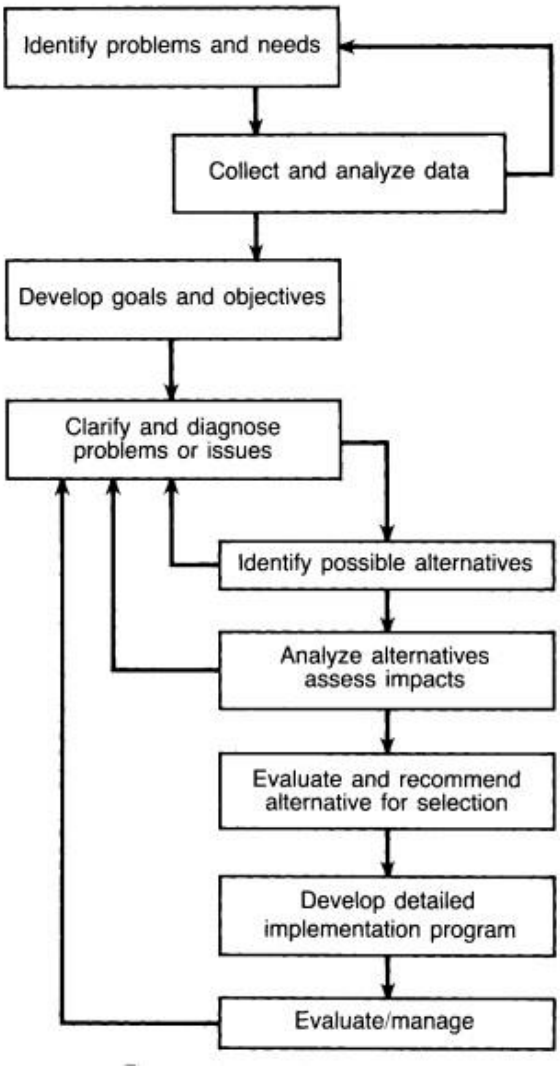


Fig. 1. The planning process

The planning process usually begins with the consideration of some problem or need. The need can be stated specifically, such as the need for additional capacity on a highway bridge across a river, as indicated by traffic congestion; or it can be very broadly addressed, such as a town's need for orderly development to protect the quality of life for its residents and assure adequate budgeting for municipal improve- ments. The problem expression may be entirely based on a description of symptoms (the planner should be careful not to confuse the problem with the symptom), or it may be the outgrowth of earlier studies that have carefully delineated a particular problem needing further study. At this preliminary stage, sufficient information may be available to identify the interested parties and the important issues. Public involvement should begin at this early stage, as should initial coordination with various agencies or groups which must be involved.

Based on the awareness that a need or problem exists, the second step in the planning process is to collect and synthesize data so as to know more about the causes of the problem and better understand how it might be solved. Large amounts of data are often available from existing sources, such as census data, economic indicators, and a variety of existing planning documents. Additional empirical data, such as transit

boarding counts, origin and destination surveys, or housing surveys, are often also collected as part of the planning process. The result of this phase of work will be a better understanding of the needs that presently exist and those which will exist in the future.

The statement of what is hoped to be accomplished in a particular planning effort is the statement of goals and objectives. The terms "goals'7 and "objectives" are typically used together, sometimes (mistakenly) interchangeably and synonymously. There are distinct differences in their definitions, however. Goals are general in nature. They are "broad brush" definitions of conditions which are to be striven for but may not be fully attainable. Examples of goals might be:

- Access to all parts of the metropolitan area by public transit
- Clean water and air
- Energy self-sufficiency
- Accurate, up-to-date mapping throughout the country
- Safe water supplies
- Elimination of unsafe, substandard housing

Examples of objectives which correspond to the goals stated might be:

- Addition of five crosstown bus routes
- Reduction of phosphorus in municipal effluent by 80%
- Development and application of a public education program for energy conservation
- Conversion of all survey records to the state plane coordinate system within five years
- Determination of procedures for coping with accidental spills into the water supply source
- Better code enforcement and municipal support services in low-income areas

After goals and objectives have been stated, the problem and the environment within which it is found need to be clarified and under- stood, and a diagnosis of the situation must be developed. With this better understanding of the problem and its environment, the alternatives developed in the ensuing phase can be more responsive to the goals and objectives. A classic demonstration of the need for clear understanding and diagnosis of a problem and its environment occurs when some increased system capacity (in transportation, water supply, solid waste, energy, etc.) seems to be required. For all projects, the problem and the needs must be clearly understood and articulated if the solution is to be appropriate. Again, the involvement of citizens is essential to understanding and defining the breadth of the problem.

The practice of presenting only one course of action for consideration and analysis is both dangerous and inefficient; it is poor planning practice and is contrary to the basic tenets of planning. The method of formulating alternatives bears further discussion. Generally, several objectives will be considered. One approach that has been used is to formulate a course of action that maximizes the benefit of each objective. In the extreme case of such planning, a "multi- objective" alternative is formulated only after evaluation of the single purpose alternatives. Thus alternatives are formulated to maximize the objectives separately, which is basically contrary to the concept of multi-objective

planning. Thus alternatives are formulated to maximize the objectives separately, which is basically contrary to the concept of multi-objective planning.

The analysis of alternatives is basically the process of determining the effects or impacts of each. This step in the planning process begins with more detailed forecasting of variables to determine the context or environment within which each alternative would perform. The impacts of the various alternatives are subsequently assessed in terms of their physical, social, economic, fiscal, environmental, or esthetic implications on the study area and its environs. Impact assessment is done with a large measure of input by affected and interested groups. An element of advocacy is injected into the impact assessment process, as each group evaluates a proposed alternative by scrutinizing it in light of its own specific objectives and concerns. A key part of impact assessment is the documentation of impacts. It is also appropriate in this context to identify to whom or what the specific benefits or detriments will accrue. Results of the analysis must in some way be displayed so that the parties involved can compare the alternatives. As in the formulation of alternatives, effective communication generally calls on a combination of written, graphic, and oral methods. It is not uncommon to revise the statement of objectives at this stage, inasmuch as the implications of the objectives often become more apparent than they were earlier in the process. New objectives may be added and those previously formulated may be modified.

The choice of criteria for evaluation is perhaps one of the most important aspects of the planning process because these criteria provide the basis for selecting a course of action from among the options available. After the effects of the alternatives have been assessed, a selection must be made of the one or ones that comprise a "best" or at least a "good" solution. Typically, the first step in this selection process is the elimination of those alternatives clearly inferior to others. Once the field has been narrowed by this screening process, a rigorous comparison of the remaining alternatives is possible using evaluative criteria. Evaluative criteria are implicit in the setting of objectives. By the time the selection stage is reached, they should be made sufficiently explicit to allow evaluation of the alternatives.

Implementation is the actual carrying out of the selected plan or recommendations. It may proceed in one or two stages. Typically, the plan is adopted and carried into design and construction, or simply into operation, depending on the outcome of the planning process. Occasionally, however, a pilot or demonstration project may be carried out. This allows the implementing agency and its clients to acquire experience with the project and also allows further development and refinement. In some instances the scientific base for the design is inadequate to predict completely the effects of implementation. In this situation, a pilot project allows testing and collection of more useful field data to enable more accurate design. Water quality management, solid waste handling, and new zoning regulations are all fields in which pilot projects or small-scale implementation can precede full-scale implementation.

In the surveillance stage the results of the planning process are monitored. Surveillance techniques determine what has occurred as a result of plan implementation, and how well such results conform to the goals and objectives that were identified during the process. The data gathered from monitoring the project during and after its implementation provide feedback to elected and appointed officials as to whether or not the selected course of action is having the anticipated effects. This

feedback is used to assess the performance of the planning process and the achievement of the objectives. Midcourse corrections can (and should) be made if needed, and additional problems can be addressed. It is possible that even if the planning process was carefully and responsibly executed, changing factors in society or the environment can alter the pattern of needs sufficiently to require an update of the development and analysis of alternatives (or even adoption of new priorities or goals). For example, in the transportation planning process, the effects of energy availability and cost can make such changes necessary. The surveillance and monitoring phase of the planning process is generally the final "closing of the loop" on a project, but it can also be the beginning of the next planning project to meet the dynamic needs of a changing society.

UNIT 3 URBAN PLANNING: PLANNING CONTEXT. TYPES OF PLANNING. ENGINEERS IN PLANNING PROCESS

Planning is essentially the first phase of the development process and, as such, is also the first step in the engineering process.

Traditionally, engineering has been subdivided into five phases: planning, design (preliminary and final), construction, operation and maintenance, and monitoring or evaluation. In some respects, planning has become identified as a separate function, and design, construction, operation, and maintenance are commonly referred to as the engineering elements. It must be emphasized that this is by no means a clear distinction. However, the division of labor that has characterized technology since the Industrial Revolution, combined with the reality of an increasingly complex society, have resulted in the separation of planning, which is the broad view, from design and construction, which are more specifically directed. This division may also be characterized by the statement that design and construction efforts are directed toward meeting a need while planning efforts, in addition to meeting needs, are also concerned with identifying the need and determining the implications of meeting that need in a variety of different ways.

Occasionally, the planning phase of a project results in a recommendation that no further engineering is necessary. Rather, benefits can be most appropriately achieved by a management or operational course of action. For example, the decision to expand bus service rather than construct a rail line, or the decision to implement an aggressive ridesharing program rather than widen a congested highway corridor, are examples of nonengineering solutions to problems which originally may have been perceived to need design or construction solutions. Indeed, there is evidence that the high cost of public works projects in recent times, combined with a growing awareness of resource limitations and environmental factors, have increased the incidence of nonengineering solutions to problems. Similarly, and largely for the same reasons, “renovation and reuse" solutions are replacing new construction in many situations.

The increasing emphasis on planning during the last few decades requires that the proposed project must also be viewed in terms of its impacts on society and the environment. The engineer has increasingly become part of a complex system of linkages between project construction and the social, political, economic, environmental, and esthetic implications of the project. Real problem solving in the engineering profession generally requires consideration of both construction and implications, and any successful problem-solving effort requires integration of the several engineering functions. Integration results from an understanding of the various roles an engineer must assume and a working methodology for incorporating all the necessary skills and information.

Planning can be almost infinitely subdivided into various disciplines and contexts. Each planning situation is different, and each type of planning occurs within its own set of guidelines and methodologies. There is great overlap among the subdisciplines. This should be expected, because urban and regional systems are interrelated.

The field generally referred to as urban and regional planning is comprised of numerous planning elements. Some of these include: transportation planning, air quality planning, solid waste planning, site planning, project planning, master planning, comprehensive planning, health services planning, water quality planning, recreation facilities planning.

This is by no means an exhaustive list, nor are these types of planning independent of one another.

Some of the subareas listed, such as site planning, are quite specific while others, such as transportation planning, can be broken down again into several components. These might include: land transportation planning, aviation systems planning, water systems or port planning.

Within these major components exist numerous other possible areas of emphasis.

For example, land transportation planning includes the following: urban transportation planning, rural transportation planning, short-range transit studies, long-range facility feasibility studies, elderly and handicapped transportation studies, paratransit systems planning.

Again, this is by no means an exhaustive list. Professional specialization occurs in all these subfields and in many even more specialized areas of study.

In addition to identification of the various technical contexts in which planning occurs, it is important to consider the application of the planning process to different sized geographical areas and over different time spans.

Planning is appropriate in all geographical contexts, from site planning or project planning, through town planning, regional planning, and state-wide planning, to planning on the national level for considerations such as energy use or air quality. Although the planning process can be applied at all of these levels, the outcomes vary depending on the context involved. For example, air quality planning on the federal level may result in national policies for achievement of National Ambient Air Quality Standards, while planning on the local level may result in the development of a new system of signalization to reduce queuing and, therefore, engine idling and excess pollutant emissions.

Planning also occurs on various temporal levels. Various planning processes result in detailed one-year and five-year implementation programs and budgeting. This is typically considered short-range planning and is most appropriate in situations where the recommended actions do not require long lead time for implementation. Long-range planning with a 20-yr to 25-yr (or longer) focus occurs when a significant infrastructure is anticipated requiring a long lead time for design and construction. Again, the outcomes of the two extremes differ considerably. A short-range plan provides many specifics for development, while a long-range plan is more concerned with general directions and policies. Much mid-range planning also takes place using a 10-yr to 15-yr time frame.

One important element of the planning process is the provision of a mechanism for coordination with other projects and communication among the various involved parties.

Awareness of and coordination with other projects or plans is critical to the success of any planning effort. If a plan does not reflect these elements and their significance to the project under study, it can present an unrealistic description of the issues involved and a misdirected recommendation for improvement. When a planning

effort fails to allow for interface with other planning efforts, the possibility exists that the recommendations will be unimplementable and the process will have to be repeated, as a plan which cannot be implemented is a worthless document. An unworkable plan typically results from lack of comprehensiveness in dealing with significant issues and implications posed by a proposed project or situation. The planning process must never take place in a vacuum.

As a principal area of project interface, planners working on the subject project should investigate both previous planning efforts and concurrent planning efforts for other projects or situations which may affect theirs. This is not as easy as it may appear.

In any given area a great many agencies, jurisdictions, and private companies are involved in a great many planning projects. The importance of this interface cannot be overemphasized. It is necessary for project planning to be consistent with other planning in the area. For example, planning a large industrial enterprise in an area zoned for low-density residential development is not consistent with the previous planning efforts which have resulted in the zoning designation. It is also possible that in some cases of conflicting proposals a compromise can be reached—a reflection of changing goals, conditions, and priorities on the part of the affected constituency. Planning for a proposed project in a particular town must, as a minimum, be coordinated with various appropriate town-level agencies, the regional planning agency, various state agencies, other towns in proximity, local and area industry, groups which have expressed interest, and the general public.

Coordination must also be maintained between the planning effort and the legal regulations and requirements of the various involved federal, state, and local agencies.

Construction of a highway or rail line, for example, could potentially require a Section 404 Permit from the Army Corps of Engineers, a Section 4(f) Statement for the taking of a recreation area, a Section 6(f) Statement for the taking of land acquired by funding under the Land and Water Conservation Act, an Inland Wetlands Permit from the local community, a State Traffic Permit, and an Indirect Source Permit from the state. This partial list of possible permits that might be required and regulations that must be complied. This is just a small cross section of considerations the planner must be aware of and agencies which must be consulted during the planning process.

Public participation is one of the most important aspects of the entire planning process. Public involvement is an integral part of the planning process, not only because of legal mandate, but also to assure that any planning effort can be implemented. The planner should not lose sight of the fact that planning, whether for general development or for a specific project, is done for a constituency, and the planner's efforts must be directed toward incorporating the needs and desires of those who live and work in the project area.

Interpretation of the way in which the public should be involved has changed considerably over the past few decades. Oversimplification of the issue of public participation should be avoided. There is more involved than just holding a public meeting and hoping people attend.

The planner has a responsibility to help the public become involved in a useful way.

The public in a given area faces numerous projects, plans, hearings, referenda, and political issues. The planner's responsibilities include helping them understand the

implications and context of the proposed project. Because the tradeoffs and the direct and indirect implications are frequently ill-defined, the public may remain confused about the ramifications of each alternative. It is important that they understand that each alternative, including the “do-nothing" option, of almost any project has positive and negative impacts on some part of the population. Part of effective planning is foreseeing this dilemma and taking appropriate steps toward helping citizens understand the issues. It is important that the planner avoid adopting a position which could be construed as adversarial.

Public participation is not just a matter of keeping the general public intelligently informed, however. “Participation," by definition, means involvement; there are very few situations where the planner can be fully aware of all issues without public input. Localized problems can be dealt with openly and adequately if interface occurs early in project planning; they cannot if the public is expected to give approval to a "selected" alternative near the end of the planning process.

It should be stressed that public participation does not mean just the general public. Provision should also be made for interface and coordination with special interest and advocacy groups. For cases where the project is private or of regional or state-wide scope, the local governmental jurisdictions must also be provided with a mechanism to deal with their concerns and input.

The linkage among the various disciplines and participants within a given project is another critical part of the planning process. The effectiveness of planning and management lies in careful coordination of these various functions. Because it is necessary in planning to coordinate various disciplines, there must be effective communication among project study participants. Planners, architects, engineers, soils scientists, ecologists, historical preservationists, geologists, economists, and others must learn to work toward the same goals which require the input of each. Modification and adjustment of the project may occur as part of this coordination effort.

In summary, planning must serve as the mechanism for two important functions in the development process:

The planner must coordinate with other proposed projects, existing plans, various government agencies, special interest groups, public bodies and the general public.

The planning process must act as a communications system for the various disciplines involved in a project—for environmentalists, designers, managers, and others involved in some way in the project or planning situation.

One of the most important contexts within which any planning effort takes place is the institutional framework governing that particular type of study or functional discipline.

Over the course of years, governmental institutions at different levels have increasingly mandated planning studies to assure that the projects and developments they are participating in (through funding) at the local level are appropriate to the situation. For example, within the transportation planning field, the federal government has a requirement that all urbanized areas with populations over 50,000 must undertake a long-range transportation planning effort which is "comprehensive, cooperative and continuing." This is just one of a number of federally required planning efforts in the transportation field. In addition, the federal government instituted the National Environmental Policy Act (NEPA) in 1969, mandating review of every major federal action in relation to its impact on the human environment.

Other levels of government have instituted their own planning requirements in the interests of either orderly development or efficient allocation of capital spending. State governments mandate planning studies in a number of fields. In addition, many states have environmental impact analysis requirements on a state level similar in intent to NEPA on the national level.

Local governments become involved in the planning process for several reasons and in several manners. Municipalities often undertake planning efforts associated with a potential federal or state grant application to meet expressed needs. A city desiring a new bus maintenance garage, for example, must demonstrate need for such a facility in a planning study. At other times, local governments undertake planning efforts strictly for their own use in promoting orderly development. Such studies may not be directed specifically toward a particular agency, funding source, or proposed action.

It is important to understand that requirements for planning and participation in the planning process occur at all levels of government. In addition, many private organizations undertake planning efforts based on public agency requirements. Two types of governmental agency interactions are necessary in order to assure a comprehensive planning effort and an implementation program with maximum opportunity for success.

The first consists of horizontal communication across: (1) The various planning subareas which might in any way be involved; and (2) the subject agency's "sister agencies" at the same level. For example, an airport noise control and land use compatibility (ANCLUC) study being undertaken by a city for operations at a municipal airport must be coordinated with existing land use planning in the area, local airfield and aviation planning, utility system expansion, zoning ordinance and building code revisions, and a myriad of economic factors. Many different agencies at the municipal level must be consulted. Generally, the approval and cooperation of a number of agencies will be necessary to ensure successful implementation of the recommended course of action.

The second type of interaction consists of vertical communication among the different levels of government involved. In the ANCLUC study cited above, for example, the airport commission and the municipality itself (as owner and operator of the airport) will have to coordinate and cooperate closely with the county of which it is a part, with the regional planning agency, with the state aviation authority and, perhaps most visibly, with the Federal Aviation Administration. Each of these levels has input to the study and is impacted by the study findings and recommendations.

In summary, the planner must be fully aware of the institutional framework within which the project under study must operate. The planner also has a responsibility to involve all agencies or levels to assure comprehensive coverage of all factors, including legislation or regulations, which might affect the outcome of the study. This communication also helps prevent any duplication of effort which may have occurred in a previous planning study, and further assures consistency among various ongoing planning efforts or elements.

UNIT 4 SUSTAINABLE ENERGY SAVING MANAGEMENT IN RESIDENTIAL BUILDINGS IN RUSSIA

One of the most considerable challenges concerning housing construction in our country is facing today is undoubtedly improvement of the efficiency of resource consumption in buildings. According to experts' estimates, the amount of energy consumed in residential houses in our country during their maintenance exceeds approximately 3.5 times energy consumption in countries with similar climate conditions (Figure 1).

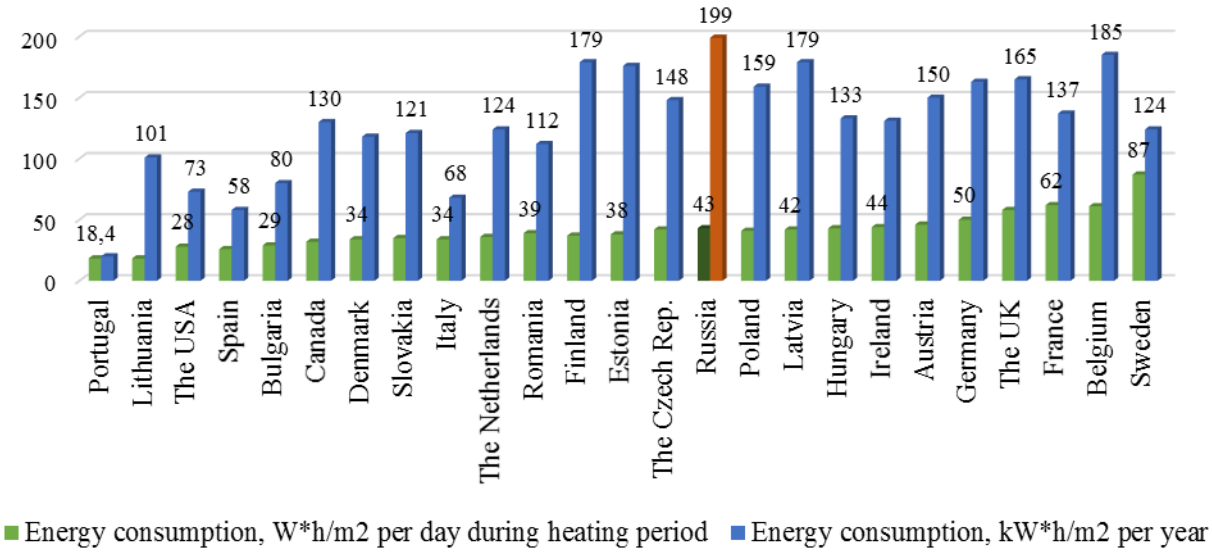


Figure 1 – Specific energy consumption for heating in residential buildings*

* *Sources: Report of "*CENTER FOR ENERGY EFFICIENCY - XXI CENTURY" *Ltd*; *database of Energy Efficiency Trends in Buildings in the EU. Lessons from the ODYSSEE MURE project. ADEME. September 2012; Entrance database; database of Buildingsdata. (http://www.buildingsdata.eu/data-search); US EIA. DOE. 2014; Comprehensive Energy Use Database*

Furthermore, it has been estimated that only one 10-storey building in our country consumes over 19,500 tons of equivalent fuel and 3.53 million m^3 water during the whole life cycle [1]. The Figure 2 below illustrates the structure and volumes of energy consumption in buildings in Russia. With such level of energy consumption, Russian housing stock has already been proven to be increasingly economically ineffective.

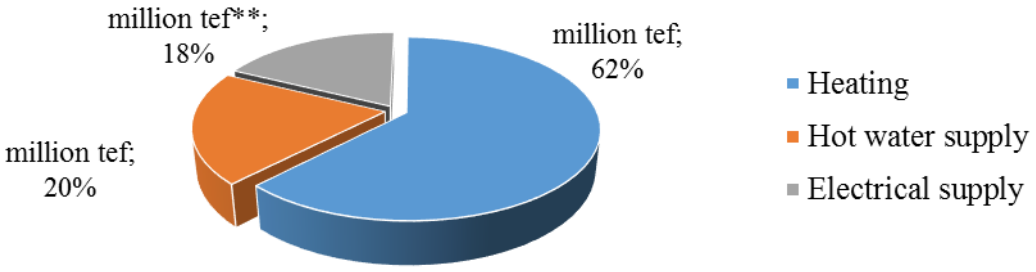


Figure 2 – Structure of energy consumption in residential buildings in Russia
*Note:** tef – tons of equivalent fuel*

The following factors cause a high level of energy consumption in the housing stock in Russia:

– longer heating seasons;

– significant proportion of dilapidated and obsolete buildings which energy and other resource consumption considerably exceeds the relevant standard;

– massive losses of energy during its transportation as a result of outdated engineering infrastructure;

– ignoring and non-acceptance of energy-saving options by the vast majority of Russian residents.

Increasing the efficiency of consumed resources is a common task, the solution of which should unite the efforts of a number of concerned groups: owners of apartment buildings, developers, municipal departments, scientific community and others. To solve it, it is expedient to apply a systematic approach. It means that efficiency of resource consumption in housing stock should be achieved in all phases of building life cycle (LC) from their environmental impact design through the complex construction process to their maintenance and even demolition through meeting of all necessary requirements with regard to energy efficiency and hygiene in a building.

Building structure is a complex dynamic system, which is permanently changing during its all phases of life cycle, thus causing a great environmental pressure. Life cycle of any building can be broken down to a set of processes and operations that interact with each other on the basis of complex cause-and-effect relations in all stages of building development from the appearance of design intent to its demolition. Relevant stages of building development are illustrated underneath (Figure 3).

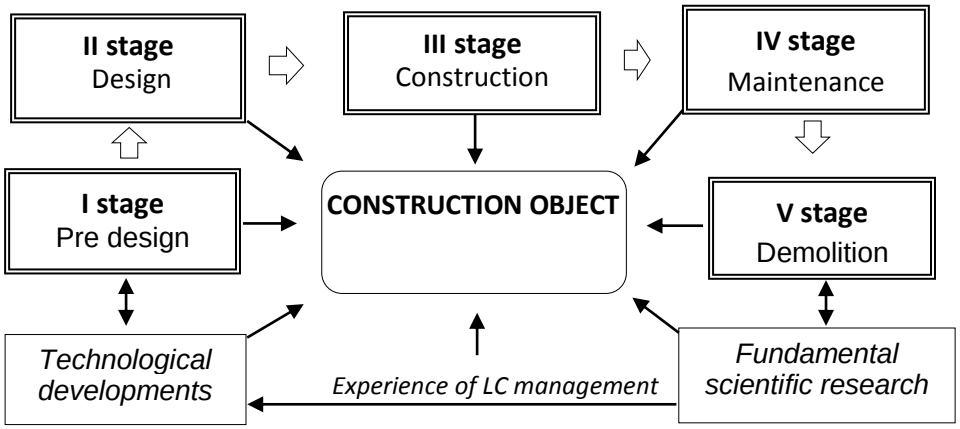


Figure 3 – Building life cycle [1]

Each stage of building life cycle is designed to meet current requirements for comfort, safety, environmentally friendly maintenance and energy efficiency of housing in order to achieve and maintain high performance indicators of buildings [2]. The following table summarizes some relevant resource-saving tasks, which can be referred to a certain building life cycle stage (Table 1).

Table 1 – Relevant resource-saving tasks during the building life cycle

Life cycle stages	Tasks regarding resource-saving and sustainable development of residential buildings
Pre-design stage	- set up a working concept of an eco-friendly and energy-efficient building, including energy and resource efficient technologies in construction and engineering systems of buildings
Design stage	- efficiency assessment of implementation of resource-saving solutions; - organisation of rational use of resources on construction site; - design of energy-saving measures
Construction stage	- high-quality execution of construction and installation works taking into account designed resource-saving measures; - ensuring the achievement of the required quality of construction products; - reduction of resource consumption on the building site; - construction waste management; - prevention of environmental pollution during the construction process; -rational environmental management and sustainable spatial development
Maintenance stage	- rational use of resources in residential buildings; - monitoring of the level of resource consumption in building and comparison with relevant indicators to identify any deviation - solid waste management
Demolition	- demolition waste management; - prevention of environmental pollution during demolition of buildings; - noise prevention; - dust protection

Construction phase has traditionally been playing a key role in the process of creation of energy efficient building, last not least because it has a considerable potential for reduction of environmental pressure. Consequently, timely implemented resource-saving solutions may ensure lowest operating costs of buildings, high level of comfort and safety.

Unfortunately, construction and maintenance of residential buildings based on resource-saving technologies face some difficulties. Among them are limited financial resources of owners and developers, lack of guidelines for selection among a great variety of resource-saving technologies, which on the one hand address later maintenance goals and on the other hand are the most appropriate for particular project development conditions. In addition, it needs to be mentioned that we also lack appropriate indicators for estimation of economic, social and environmental footprint resulting from the implementation and further use of resource saving technologies [3, 4].

Taking into account the high level of energy consumption in the housing stock in Russian cities and its distribution over life cycle stages, it seems to be relevant to develop and put a system of sustainable resource saving management into practice of maintenance of Russian buildings (Figure 4).

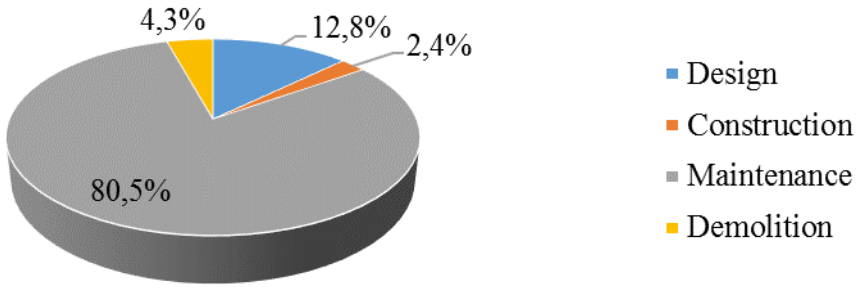


Figure 4 – Distribution of energy consumption in building life cycle phases

The main elements of proposed management system of sustainable energy saving in residential buildings are:

- information support services, which provide managing and disseminating information on modern technologies and guidelines of resources saving, needed to increase the efficiency of resource consumption in buildings, as well as environment awareness of consumers;
- management of household and construction wastes generated during the maintenance of buildings to prevent the environmental pollution;
- monitoring of energy consumption level to identify groups of buildings required energy sanitation, as well as assessing the effectiveness of implementation the energy-saving solutions in buildings;
- development and timely implementation of programs for current and capital repairs, including activities on resource saving, energy-efficient reconstruction of buildings.

Information support of resource saving and monitoring of consumed resources can be performed by housing companies. The latter contains:

– analysis of the volume, composition and structure of consumed resources;

- analysis of dynamic of resource consumption change;
- assessment of degree of accounting and control over the use of resources in residential buildings.

It should be mentioned that waste management and development of integrated programs for current and capital repairs are under the jurisdiction of municipal authorities.

Improvement of energy efficiency in the housing stock nationwide will lead not only to the reduction of energy consumption and environmental pressure in both natural and urban areas [5]. Moreover, this will inevitably result in the growing of wealth of Russian citizens as utilities expenses will decrease.

UNIT 5 SUSTAINABLE DEVELOPMENT: EFFECTIVE URBAN MANAGEMENT IS A CONDITION FOR CITIES' SUSTAINABILITY

The policy framework for the sustainable development of urban areas requires multilevel cooperation among local, national and global communities and partnerships to mobilize public and private resources. Democratic legitimacy and stakeholder consultation are important.

Sustainable development of urban areas requires integration and coordination, including regarding land-use issues, food security, employment creation, transportation infrastructure development, biodiversity conservation, water conservation, renewable energy sourcing, waste and recycling management, and the provision of education, health care and housing.

Synergies can be identified, e.g., between waste and recycling management (environmental management) and access to water and sanitation (social development), between air quality conservation and green public transportation, and between production and distribution of renewable energy sources and green energy access, as well as between the goal of reducing inequities (effective urban governance) and access to education and health care (social development).

The *Survey* proposes an integrated set of investments in infrastructure, public services and capacity development for different groups of countries. An integrated approach to rural and urban development is critical. Investment in economic and social infrastructure in rural areas might improve productivity, reduce poverty and inequity and create additional opportunities for sustainable livelihoods.

Sustainable development of cities in poor countries entails investment in infrastructure such as roads, water, sewers, electricity and services such as schools, public transportation and health care. Leapfrogging investment in a green industrial transformation can generate youth employment. In cities of middle- and high-income countries, investment in infrastructure, renewable energy, buildings, and improved electricity and water efficiencies is important. Investment in the reduction of waste production and improvement of waste collection and recycling systems is needed in most cities across the world. Providing access to modern energy services is a real challenge to urban authorities in developing countries which often do not have enough capacity to respond, nor the ability to raise the needed long-term financial resources for investment.

A "one size fits all" approach towards sustainable development in cities is precluded, since cities' priorities, objectives and paths are highly diverse. Policy frameworks need to promote a common integrated approach, while differentiating among the responsibilities of upper-, middle- and low-income countries. Consequently, measures of sustainable development progress also need to be tailored to the particular challenges and opportunities identified and prioritized by the cities' main stakeholders.

Ensuring food and nutrition security

It is essential to ensure that everyone in the world has access to enough nutritious food. The *Survey* highlights the challenges in this regard and the changes to the food system that are needed to ensure food and nutrition security by 2050.

The target of halving the proportion of people suffering from hunger in sub-Saharan Africa will not be met

Basic food insecurity still affects 1 billion people, as many as in 1970. However, the proportion of people who are undernourished declined from about 20 per cent in 1990-1992 to 15 per cent in 2008-2010. Progress has been uneven across regions and the 2007-2008 food and financial crisis posed additional challenges. Under current conditions, the target of halving the proportion of people suffering from hunger by 2015 will not be met in sub-Saharan Africa and South Asia.

Because of low quality and low diversity of available food, the challenge of malnutrition is broader than the issue of hunger or undernourishment. Individuals may take in enough calories for daily subsistence, but still suffer from “hidden hunger” with low levels of micronutrients owing to the lack of diversification of diets. This is a problem in both developing and developed countries, affecting 30 per cent of the world’s population. The excess of calories is another rising major global public-health concern, as overweight and obesity result in more than 2.8 million deaths among adults every year.

Estimates indicate that food production will have to increase 70 per cent globally to feed an additional 2.3 billion people by 2050. Food demand is anticipated to continue to shift towards more resource-intensive agricultural products, such as livestock and dairy products, thereby exerting additional pressure on land, water and biodiversity resources.

On the supply side, meeting an increasing food demand is a major concern, given the rise of resource constraints. Current agricultural practices are a leading source of greenhouse gas emissions, while also leading to other problems, such as loss of soil fertility and water pollution from run-off. Increased temperatures and more volatile weather patterns caused by climate change may already be affecting crop yields, affecting incomes and agricultural production.

Increased land use for biofuels will increase constraints on the supply side and may lead to higher food prices, further affecting the most economically disadvantaged. Similarly, current urbanization trends accelerate the diversion of land use from agricultural production.

The food, water, energy, environment and climate nexus

An integrated approach to food security and the environment should take into consideration the food, water, energy, environment and climate nexus, while reorienting food production, distribution and consumption. Food security, while minimizing environmental impacts and increasing natural resource efficiency, will require increasing agricultural productivity, in particular in developing countries where agriculture accounts for a large share of gross domestic product (GDP) and where large productivity gaps still exist. Rapid increases in yields are deemed feasible, in particular where productivity gaps are high. At the same time, the protection of soil quality and crop and grazing land management, including restoration of degraded lands, have been identified as having the greatest agricultural potential to mitigate climate change, in addition to being cost-

effective. Additional public investments in agriculture-related research and development will be crucial to increasing productivity.

The private sector will need to play a major role in expanding research, particularly in biotechnology, with a focus on food security. Special efforts are also needed to close the productivity gap of smallholder farms, which offer great potential for engagement in sustainable agricultural practices. Faster productivity gains among a large number of small-scale producers in very different agroecological regions will require improved dissemination and adaptation of technology to meet their specific needs.

A broad-based rural development strategy has to include infrastructural investments to better connect producers to output markets, including in rural-urban linkages and the improvement of distribution systems and storage facilities. The prospect of new economic opportunities, including institutional changes that facilitate access to input markets, as well as credit and insurance markets, will also encourage smallholders, especially women farmers, in developing countries to increase their productivity.

Social protection mechanisms, including social safety nets, must also be part of a broader rural development strategy to facilitate access of low-income households to food. This will not only protect the most vulnerable against short-term economic shocks, but also contribute to long-term resilience by facilitating their access to food and by strengthening the ability of smallholders to manage risks and adopt new technologies with higher productivity.

Reducing food wastage may contribute to the sustainability of the food system

To reorient food consumption towards diets that are less-resource intensive and more nutritious will also be crucial for food sustainability. In particular, reducing food wastage may contribute significantly to the sustainability of the food system. Currently, it is estimated that 32 per cent of the total food produced globally is wasted. In order to substantially reduce the quantity of food lost and wasted, changes have to take place at different levels of the food chain: production, storage, transportation and consumption. In developed countries, efforts are most needed at the retail and consumer end, owing in part to management practices and consumption habits. In developing countries, interventions are needed at the producer end, before food reaches the market, to address inadequate harvesting techniques and storage conditions. Speculation in land and water has to be addressed at both the national and the international level. More

investment funds will be needed to help implement these strategies and to support other countries in developing their own strategies for reinforcing the resilience of food production systems.

The international community can help developing countries in their efforts to design and implement policies that increase resilience to food price volatility and to climate variability. Priority actions should include reviewing trade policies to ensure that they support food and nutrition security, while establishing a transparent food market information system with timely information on regional and international stocks. The reliability and timeliness of early warning systems need to be improved at both the national and regional levels, with a focus on countries that are particularly vulnerable to price shocks and food emergencies. The current global trading system also needs to be reformed so that the poorest can be provided with just and fair access to markets.

Changing the production and consumption patterns of wealthier countries and consumers, including dietary habits, could make a remarkable contribution to ensuring food and nutrition security. The livestock sector, which has grown rapidly to meet the increasing demand for meat, is a prime contributor to water scarcity, pollution, land degradation and greenhouse gas emissions. This trend will need to be reversed in the context of more sustainable diets, but as long as market prices do not reflect such scarcities, there will be insufficient incentives for behavioural changes. Publicity, advocacy, education and legislation will need to be used to bring about such cultural changes so as to reduce high levels of retail and domestic food waste in high- and upper middle income countries; furthermore, better policy instruments for promoting sustainable diets are still needed.

UNIT 6 ENVIRONMENTAL AND ENERGY PLANNING

The inevitable increase in population and the economic development that must necessarily occur in many countries have serious implications for the environment, because energy generation processes (e.g., generation of electricity, heating, cooling, or motive force for transportation vehicles and other uses) are polluting and harmful to the ecosystem.

Energy is considered to be a key player in the generation of wealth and also a significant component in economic development. This makes energy resources extremely significant for every country in the world. In bringing energy needs and energy availability into balance, there are two main elements: energy demand and energy supply. In this regard, every country aims to attain such a balance and hence develop policies and strategies. A number of factors are considered to be important in determining world energy consumption and production, including population growth, economic performance, consumer tastes, technological developments, government policies concerning the energy sector, and developments on world energy markets.

As stated above, there is an intimate connection between energy and the environment. A society seeking sustainable development ideally must utilize only energy resources that cause no environmental impact (e.g., that release no emissions to the environment). However, since all energy resources lead to some environmental impact, it is reasonable to suggest that some (not all) of the concerns regarding the limitations imposed on sustainable development by environmental emissions and their negative impacts can be in part overcome through increased energy efficiency. Clearly, a strong relation exists between energy efficiency and environmental impact since, for the same services or products, less resource utilization and pollution is normally associated with increased energy efficiency. Energy conservation, that is, the use of energy resources in a rational manner, represents another factor that together with energy efficiency can lead to the stabilization of the rate of growth of energy demand, which is predicted to increase rapidly in the near future due to population growth and excessive use of various commodities (e.g., cars, computers, air conditioners, household electronic equipment, etc.). Any reduction in the energy demand of a society leads to the extension of its available energy resources.

The main kinds of energy resources are listed and characterized in terms of resource amounts, production, and consumption. To be able to project a future sustainable economy, it is important to set the context by correlating various factors, such as the present energy resources, the population growth, and the evolution of energy demand in the next 30 to 50 years. Fossil fuels and nuclear fuel are finite, while other energy resources are renewable. The term renewable energy suggests an energy that can be renewed, or in other words cannot be depleted. A forecast of energy resource consumption and depletion up to the year 2050 is given. Some case studies are presented at the end of the chapter, and a number of problems are proposed.

A capsule definition for development is that it is a process which sets out to achieve progressive advancement to the human condition, involving taking action and attaining material growth and social fulfilment over time. Myerson and Rydin (1996) hold that development is only “real” if it improves the quality of life, which tends to establish

that some development is ‘bad’ and, indeed, that ‘good’ development is only that which achieves progressive advancement to the human condition. What is under consideration here is the way the development-through-growth emphasis results in the commodification of land and landed resources, along with the generation of solid gaseous and liquid wastes, and an accumulation of irreducible toxins. A complication arises in that in ‘new age’ terms the process is now also expected to be ‘sustainable’ in the style of conservation with development – a coupling which has historically been characterized as mutually excluding.

An important point to make is that this matter of sustainability will not be socially acceptable or societally workable if it harps on about less consumption, a reduced economy and reduced profits, and, or also, an economic slowdown. From a Canadian perspective (Lucie Sauvré 2002) there is for sustainability a ‘sort of “newspeak” that is spreading throughout the world, superimposed on each culture and reducing the ability to think differently about realities’. The trick is to enhance investment and growth within a sustainability framework. This involves the exercise of a strategic choice – to achieve conservation and development outcomes concomitantly, and consciously to set about creating and maintaining landscapes worth cherishing.

A selection from myriad definitions of planning is public forethought (the setting of objectives) and conscious involvement (the empowerment) before taking community-determined public-interest action to effect improved change. Thereby arises a compound definition for planning: a democratic advancement of the overall human condition; connecting public prescience (setting objectives); and conscious involvement (community discourse and empowerment) before action is taken to bring about improved change. This emphasis fits into a larger framework of understanding arising from a North American (Myers and others 1997) set of ‘Anchor Points for Planning’s Identification’ which I summarize, add to, and rerank.

In these terms planning

- Links knowledge and action: connectedness
- Improves the humanized and natural environments
- Holds out for useful interconnections
- Focuses on the future
- Honours cycles: seasons, life patterns, highs and lows
- Designs artfully and redesigns thoughtfully
- Balances socio-economic-environmental outcomes
- Engages in a participatory style of decision-making
- Works for diversity and variety of outcome
- ‘Works around’ rather than ‘pushing through’.

Aside from semantic quibbles, this compound list-phrasing portrays something democratic, spatially applied, and potentially flexible, in the public domain; a public-interest prescriptive matter which, following consultation and discussion, is done and delivered. Planning is the actual bringing about of desirable changes for an improved overall future through the medium of predetermined human action. It also involves the interpositioning of design, particularly growth pattern (regional) design and urban physical design.

Within democracies these desirable changes implicate a vast complexity, which can be viewed as part balance with, and part trade-off between, the ‘pursuit of material

growth', the 'attainment of social wellbeing' and the 'maintenance of an environmental harmony'. Another way to make this point is that sustainable planning embroils an all-resources (human, fiscal, physical) management. That context, in accordance with contemporary idiom, is where this writing 'is coming from': reformist in democratic intent within an enabling socio-economic-environmental context; in character 'neomodern' and in emphasis 'sustainable'.

Contrasting with depictions of 'development' and 'planning' no consistent capsule definition of sustainability can be produced, with each nation and every sector staking out different claims, all normal dictionaries becoming useless in a play where the goalposts are frequently moved. The general notion and discourse about sustainability is not misunderstood, even if it largely figures in tokenist statements and is observed 'in the breach' by most governments, many local communities and most individuals. It is in the urban context that the main blind spot occurs, the settlements where 80 to 90 per cent of the Anglo settler society populations live.4 Here the population is unreservedly consumerist, and generally considered to be beyond sustainable recovery.5 Urban places consume resources from without, and discard wastes to the beyond, to a degree which is in fact unsustainable!

Of course urban inhabitants could – and many do – live in a more sustainable way by reducing consumption and waste disposal. Over the longer term that kind of progressive outcome might be socially engineered, bringing into being a congruence of social policy and environmental justice – albeit uneven social policy and rough environmental justice. Along this path 'sustainability', a former 'specialism', is now becoming a core philosophical 'generalism' for urban and regional planning and planning school curricula. Power for the sustainable ideal arises from the fact that nobody now argues openly against it; indeed a problem has arisen for committed 'green' enthusiasts through a hijacking of their environmentalist lexicon by the likes of genetic engineers and fossil-fuel providers!

An aspect that is frequently misunderstood is that the pursuit of sustainable policies can factually mean more, not less, economic activity – a 'win-win' factor not lost on the automobile industry and some fuel and energy providers. Sustainable planning practice – essentially conservation with development – engages more people, takes up benign yet quite complex technologies, and results in more money being spent on both conservation and development.

There is a remainding question: how, against the hedonic OECD–GATT–WTO consumer trend, did a worldwide prognosis arise in the style of the Agenda 21 Rio Declaration. This, from a sceptical standpoint, is something of a contradictory newage hoax, for 'sustainable conservancy' and 'material development' are for the most part separate and exclusive of each other. Agenda 21 attempts a radicality: 'sustainable development', vaguely defined. This comes across as blurred imagery because of the diplomatic necessity at the Rio Conference to accommodate the vagaries of the rich and poor nations being courted. The pragmatic challenge, in the phrasing of Robert Fri (1991) is 'to put our practice on a par with our principles'. Quite so: but signatories to the 1992 Rio Earth Summit protocol had not produced their 'Agenda Statements' by the agreed 1997 deadline simply because the decision-taking processes involved were neither fully understood nor partially fashioned by that date.

The contemporary sustainable basis of reasoning had its genesis within the Brundtland Report (1987) prepared for the World Commission on Environment and Development as Our Common Future. That document defined 'sustainability', somewhat tautologically, as comprising three goals:

- *To ensure* that all societies' needs are met.
- *To ensure* that all members of societies' have their needs met.
- *To ensure* that all development and conservation is sustainable over time in a social, economic and environmental sense.

A characteristic of the sustainability narrative is the persistence of emphasis on unimpaired environmental quality over time, with no loss of material wellbeing, yet exhibiting some social gain. This adds up to the impracticality of attempting to both 'have and eat the same environmental cake'! Operationally, that is in the procedural context of neomodern conservancy with development, there arises a moral challenge to retain an ethical focus, along with a practical challenge to assess and resolve all manner of unacceptable risk. This is not merely a matter of obviating the monetary risk to big-game players. It involves heralding composite risk, social, economic, environmental, for all sectors and individuals within communities of concern – for households, for neighbourhoods, for settlements and for regions.

An intensive and well-balanced attempt at 'Defining a Sustainable Society' is available from a Robinson, Francis, Legge and Lerner (1990) presentation. Their expression reaches beyond sustainable development into cultural neomodernity for a 'sustainable society'. In their collegiate context these four set out to establish 'that there is no single version of a sustainable society'. They 'rule out environmental autocracy' and establish the useful notion that for organized human society, 'sustainability can never be said to be completely achieved'. The neomodern paradigm stemming from their contention gives rise to the view that 'we can usually say more about what is not sustainable than what is sustainable', a position that is not only correct, it is also one that strives to explain what sustainable urban planning entails as well as being a stimulus to bringing it about.

There is also Crosson's (1994) more pragmatic and targeted definition: that a 'sustainable agricultural system (his example) is one that indefinitely (American usage) meets demands for agricultural output at socially acceptable economic and environmental costs'. Clearly 'cyclicity' – birth–life–death, climatic seasons, water cycles, and the carbon cycle – is central to the human pursuit of sustainability. Extending from this, it is possible to fashion a parallel neomodern definition of 'sustainable urbanization' as that democratic style of urban provisioning which indefinitely meets the need for access to employment, education, entertainment and recreation at a socially acceptable environmental cost. Emphasis will be placed later, in chapter 3 (Charter) on the awkwardness of the 'sustainable management' notion in the sense of its 'environmental only' application, The main point is that the forces of market drift, consumer desires and developer inclination are significant, and have generated compulsions within settler societies, particularly affecting the peoples excluded from,and culturally ambivalent about, the Western development ethos.

It is also important to recognize the place and role of the appeal-hearing agencies (courts or tribunals in some jurisdictions) because of their placement for the delivery of progressive, useful, politically correct and ethically acceptable rulings. These tribunals

are custodially and legally significant because, in their absence, the entrenched position of local government has been one of ‘leave it to us’ (the elected local officials), to the ‘landowners’ (the holders of development rights), to ‘developers’ (who presume to provide what they believe citizens want); and above all else, leave everything to that imperfect accessory to societal wellbeing, the ‘market force’.7 The greatest challenge to neomodern – thus of the twenty-first century – settler society is to retain the ability to achieve capacity empowerment and social wellbeing in a manner which avoids environmentally damaging growth.

Considering sustainable green energy strategies, it can be concluded that the most important scenario to encourage transition to green energy technologies is to facilitate interactions among countries, scientists, researchers, societies, and others. Investment in green energy supply should be encouraged by governments and other authoritative bodies for the interest of having a green alternative to fossil fuels. Assessments of the sustainability of processes and systems, and efforts to improve sustainability, should be based in part upon thermodynamic principles and especially the insights revealed through exergy analysis. The development of a sustainability index or a ratio of energy utilization (per kind) is very important in establishing reasonable strategies and policies for sustainable energy

UNIT 7 URBAN PLANNING AND ENERGY EFFICIENCY

More and more communities formulate climate protection, energy efficiency or renewable energy targets and think about a sustainable future-proof energy infrastructure for their citizens.

Spatial planners face a new and comprehensive challenge. Roughly three quarters of the European population live in cities. The building and construction sector represents more than 40% of all energy consumption and related emissions, transportation is another important source of pollution.

Many projects for eco-cities and -districts, zero-energy buildings and new experiments of energy efficiency prove that spatial planning can substantially and positively influence on the uptake of renewable energies and energy efficiency measures. It is the key to a socially, economically and ecologically more sustainable future. Many encouraging examples show that economic benefits can be achieved through spatial planning that has incorporated climate change and energy efficiency related aspects.

The “energy transition” requires a change in the way we think our future and behaviour. It will only happen, if and when all actors in the value chain understand the need for change as well as the possibilities and tools at hand. Expertise in climate and energy is needed on all levels of spatial planning. While traditionally, energy supply and urban planning were perceived as separate domains of expertise, we need to provide new skills and tools to planners today with a view to creating smarter and more sustainable communities.

A collective energy solution for the benefit of all requires local government and urban planners to take on a pivotal role. Specifically, upgrading of the public building stock should go hand in hand with the establishment of heating and cooling plans. A comprehensive approach to local energy supply and demand, and the development of eco-districts, will help to keep costs for the citizens at affordable levels.

In existing urban areas, the introduction of energy efficiency (EE) measures and renewable energy systems (RES) face significant barriers because already existing infrastructure and legal mechanisms have to be taken into account. Moreover, any operation is on “open core”, as functions and fluxes have to be maintained, resulting in higher investment and therefore lower economic feasibility. While developing urban structures, the urban planner is the first to make decisions that influence how RES or EE can be implemented in the planned urban area. Even with relatively small adjustments in the urban plan, considerable opportunities for RES and EE may materialise. For instance, compact urban structure may enable: public and light transport to be prioritised over individual cars; biomass and waste heat to be used at large scale by means of district heating and cooling (DHC) networks; co-generation of heat and power (CHP) to maximize the overall EE; decentralised RES solutions to be integrated with other communal energy systems. In order to ensure that RES and EE are included right from the beginning of the planning process, training of both urban and energy planners is needed. A new type of co-planning can be developed, which is more integral and effective than the traditional co-operation of urban and energy planners. For new urban settlements, the traditional co-operation is that a municipality creates a

general location plan in which buildings can easily be built and connected to roads, and defines the physical dimensions of the buildings. The building code ensures the new buildings meet the EE norms. Thereafter, the energy and water utilities connect the buildings to their infrastructure in the best way still possible. Nevertheless, such connections may come all too late to optimize the RES and EE! In the co-planning method, energy and urban planners will co-plan the development area together from the beginning. Co-planning of urban and energy structures can reduce primary energy consumption and related emissions, even costs.

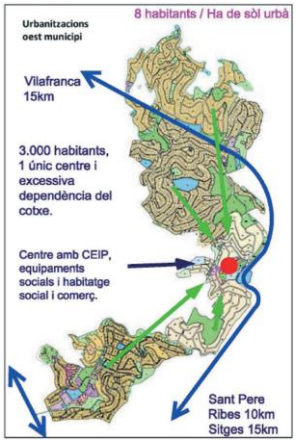
Such new co-planning, to be carried out by urban planners (typically architects), and energy planners, (predominantly engineers), is challenging due to their different backgrounds. In order to facilitate co-planning, training of both urban and energy planners is needed. In order to provide the necessary technical capacities and to facilitate co-planning in the future, different forms of pilot training to introduce and improve energy skills of urban planners were carried out in five countries: Finland, Germany, Hungary, Spain and U.K. In very few planning schools in the world, however, urban and regional planners are educated to understand energy, and RES and EE in particular. Such combined skills of energy and urban planning have become vital while fighting climate change: the urban planner is the first actor in the planning process, the plans of whom will either restrict or enable optimal RES and EE implementation later on.

Many cities all over the world have success stories to tell about how urban structures in which both use of RES and EE could exceed the traditional practice. Such stories demonstrate the practicability of how the theories and intentions can materialize in real life, and with measurable benefits.

Example 1.

In the municipality of Sabadell, the participants belonging to the Municipal Social Housing Development Agency, focussed on the improvement of an urban development plan actually under review. The original plan was elaborated with their own participation years ago, so they had deep knowledge of the site and its specific requirements. The ideas and competences developed in the long course brought them to raise issues and concerns that were not at all a point of discussion previously. Their proposal of a review of the actual urban development plan modifies the foreseen road hierarchy and tracing, building uses and height, questions the privacy of the subsoil in view of the need of common infrastructure, and includes centralised low enthalpy heat production and distribution.

The feedback received from their Director who appointed the two senior experts to the long term course: “Before the long term course, I had to pull my staff towards ambitious goals and ideas, now they caught me up and even overtake!” Currently, the entity is looking for financing mechanisms to implement deep renovation pilot activities to promote energy efficient refurbishment in their neighbourhoods.

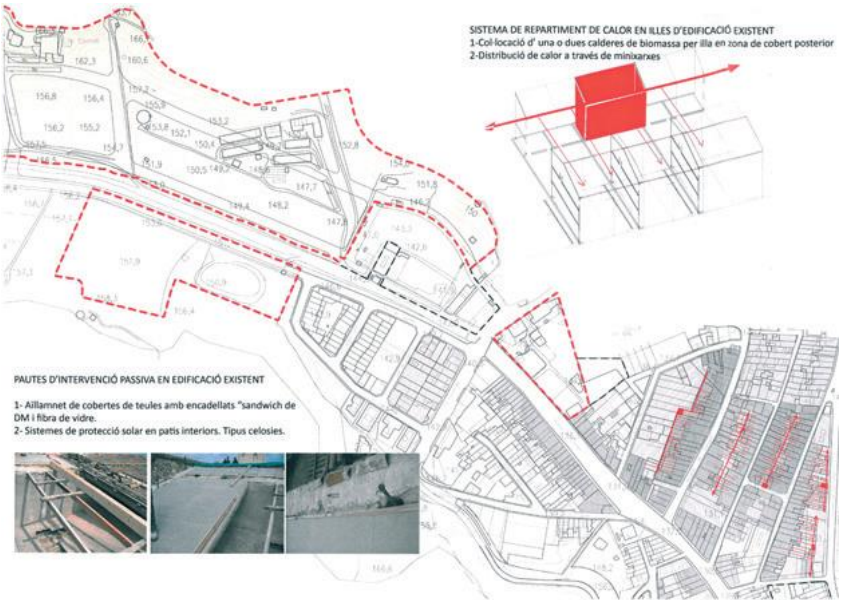


Example 2.

The energy diagnosis elaborated for the very low density municipality of Olivella, South of Barcelona, led the urban planning team to identify the private mobility to be the main issue to tackle, as no centralised thermal energy distribution would be feasible and incentives for improving the decentralised systems are already existing. Apart from energy efficiency improvement proposals especially for public lighting, the project team made an exhaustive analysis of the daily and weekly mobility scheme of the inhabitants and designed an economically attractive public transport system based on electric micro-busses and a fixed tariff scheme. The main objective is to avoid CO2 emissions by reducing the private fossil fuel driven car park without diminishing tax income for the municipality, offering high mobility standards to the inhabitants.

Example 3.

One project team focussed on centralised biomass fired CHP and DH in compact villages of Central Catalonia. The working group established links to half a dozen neighboured villages and analysed their heat demand but also the offer of biomass raw products within their own scope, coming from forest or agricultural exploitation of the more than 12000 ha belonging to the analysed cluster of villages. The results are a convincing plan they presented already during the long term course to the main stakeholders within the area and the project of a service company enhancing the management of the entire value chain, from raw materials up to the delivery of heat.

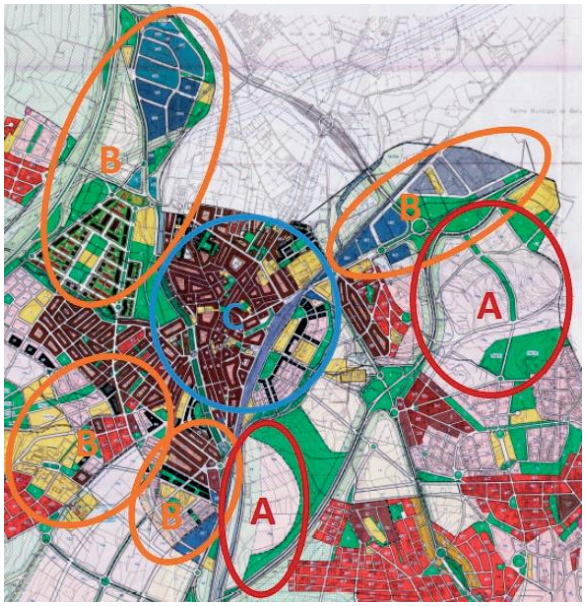


Example 4.

For Arenys de Munt, a coastal town North of Barcelona with 8500 inhabitants, two different types of district energy supply were proposed, one meeting the demand for a new urban development including several public buildings and a sports centre, the other consisting of a number of small scale networks in the existing urban fabric. Dimensioning is done and urban plots for implementing the production plants are reserved. The biomass supply is foreseen to be met through the neighbouring forest area Montnegre-Corredor.

Example 5.

For the small scale city of El Vendrell, with 38000 inhabitants, that already started different actions to improve sustainability aspects within the municipality, three main interventions were proposed: To increase density, agricultural land foreseen for new urban developments is requalified to be maintained (A), several neighbourhood district energy networks are dimensioned, mainly in residential areas as more than half of space heating is actually delivered by mobile electric heaters and 75% of the dwellings are cooled (B), and a mobilityplan is proposed for the dense historic city centre (C).



The urban planner is the first actor to influence the sustainability of The community in terms of primary energy consumption and emissions. Therefore, he / she should be aware of the basic features of energy and related Emissions caused by electrification, heating, cooling and transportation inside The community and transportation.

The issue of climate change has set new requirements for urban and regional Planning that only can be addressed by co-planning of urban and energy Planners together. To be successful, such co-planning requires new skills And attitudes from both urban and energy planners.