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ENERGY EFFICIENCY IN HOUSING

CONCEPT NOTE

Note prepared by Austria

Summary

This note was prepared by the delegation of Austria in cooperation with the secretariat, further to a proposal made at the sixty-eighth session of the Committee on Housing and Land Management (ECE/HBP/145). The note provides background information on trends in energy efficiency in housing in the region and suggests possible work to be carried out by the Committee on this issue.

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Introduction

1. As noted in a recent report[1], unless efficiency is raised in many countries in Eastern Europe, Caucasus and Central Asia (EECCA) and South-Eastern Europe (SEE), increased housing construction and home ownership will be accompanied by increasing electricity consumption. In general, existing buildings, in particular those constructed between the 1960s and the 1980s, are characterized by low thermal efficiencies and wasteful heat distribution systems. New buildings are also being built with low thermal efficiency. Many of the countries in the region still use construction norms and regulations dating back to the Soviet period. For instance, energy efficiency in Ukraine's housing stock is 3 to 5 times lower than that of western countries. Heat loss in buildings in Kazakhstan is 50 to 60 per cent higher than in developed countries under comparable conditions.

2. Worldwide, 30 to 40 per cent of all primary energy is used in buildings. In OECD[2] countries, buildings are responsible for 25 to 40 per cent of total energy use. In Europe, buildings account for 40 to 45 per cent of energy consumption in society, contributing to significant amounts of carbon dioxide (CO_2) emissions. In the European Union (EU), the residential sector represented 77 per cent of all CO_2 emissions from buildings in 2002. In low-income countries, the share can rise over 90 per cent (United Nations Environment Programme data, 2007). National Climate Protection Plans – for example, in Austria – list housing as the major area for reducing CO_2 emissions, together with transport and industrial production.

3. However, low thermal efficiency also has other impacts, including social ones, which are becoming significant for lower-income groups with little or no district heating in EECCA and SEE countries. This was for instance the case in Armenia, Azerbaijan and Moldova during the late 1990s, when many tenants heated their houses at survival levels only. These groups have also been using "dirty" fuels such as kerosene in cheap stoves, which have had detrimental effects on indoor air quality and health. Thus, improving energy performance in residential buildings can help to avoid social exclusion, as an increasing number of low-income households can no longer afford the costs of heating –often the largest part of total expenditures on housing. Moreover, from an economic point of view, better energy performance of buildings contributes to reducing national dependence on energy imports.

4. In general, the promotion of energy efficiency in the housing sector has gained worldwide support. The United Nations has put the topic of climate change at the top of its agenda, and the importance of practical work in this area has been underlined by co-award of the 2007 Nobel Peace Prize to the Intergovernmental Panel on Climate Change – for "efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change". Experience gained in several UNECE member countries clearly shows that the housing sector can strongly contribute to these goals. To this end, the EU has taken important steps to reduce energy consumption in the residential sector, including the opening of the Structural Funds to measures of energy efficiency in the "new" EU Member States and funding programmes such as Intelligent Energy Europe in the 2007–2013 funding period. EUROCITIES has just published the results of the October 2007 Gothenburg Conference "Towards an energy efficient city". The EU will also organize the Sustainable Energy Week 2008, with a half-day conference on the theme of "Housing and the

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[1] European Environment Agency, "Sustainable Consumption and Production in South-East Europe and Eastern Europe, Caucasus and Central Asia", Copenhagen, 2007.

[2] Organisation of Econonic Co-operation and Development.

European Energy Transition". Last but not least, the European Performance of Building Directive, to be transformed into national law by all EU Member States by the end of 2008, provides a strong incentive for better energy performance by strengthening the role of consumers (existing or future dwellers) in energy saving.

A. Improvement of energy performance in the existing housing stock

5. Energy reduction in housing has been a major field of research during the last years in more developed countries, both for existing housing and for new housing construction. This has led to vast improvement programmes for existing housing stock, with an emphasis on buildings dating from the 1960s to the 1980s. Experiences show that such programmes lead to an average reduction of energy consumption by 50 to 60 per cent. Successful projects depend, however, on the identification of the appropriate building techniques, as well as effective distribution of roles and responsibilities and on the availability of financing instruments.

6. While some countries have carried out impressive programmes, others are still lagging behind, often because of insufficient technical or organizational know-how. Ironically, this leads to a situation where dwellers in "rich" regions pay significantly less for energy than those in poorer regions (under the assumption that energy costs will reach similar levels in all countries within the next years). This situation can be observed in several countries in the EECAA and SEE subregions, where an improvement of energy performance in the existing housing stock is hampered for a number of reasons, including:

(a) Unclear responsibilities and insufficient financing after the privatization of the formerly public rental housing stock;

(b) Weak local construction industries with low innovation capacities;

(c) Weak or non-existing public and/or private research and development activities;

(d) Lack of knowledge about new technical options with respect to thermal improvement of existing residential buildings.

7. As the result of – and in some cases despite of – the support of public subsidies, improvements have been technically incorrect, often bringing worse performance instead of increased efficiency. In other cases, subsidies have led to the construction of sporadic pilot projects, which were very expensive and not replicable. Therefore, EECCA and SEE countries would benefit greatly from the know-how developed in other parts of the UNECE region regarding energy efficiency in existing multi-storey housing stock.

B. Improvement of energy performance in new residential housing construction

8. In most developed countries in the UNECE region, the reduction of energy consumption of new residential buildings has came in several stages. Initial improvements – mainly made by adapting building codes – were already being implemented after the 1970s "oil shock" (e.g. double and triple glazing). However, it is only more recently that significant changes have taken place, encouraged by new technical developments. Today in many of these developed countries,

"low-energy" buildings (i.e. with an energy consumption per m^2 and year of less than 50 kw, as compared with 150 to 200 m^2 in "normal" housing) have become widespread.

9. The latest developments include "passive housing" estates, where comfortable room temperatures are achieved by means of passive components (e.g. good insulation, heat recovery from recycled air and use of internal sources of heat such as existing household appliances, "human heat"). Passive housing does not need any kind of conventional heating system; the additional energy needed (e.g. for the cooling system and for hot water) can come from conventional sources such as gas, district heating or even solar energy. Passive housing reduces energy consumption by an average of 12 to 13 kw, or about 90 per cent compared to "normal housing" and by about 60 per cent compared to innovative low-energy buildings. Experience, mainly in Austria, Germany, Switzerland and the Scandinavian countries, shows that such buildings also have a high degree of efficiency in cold winters, and are thus very popular with the inhabitants.

10. Given the higher level of awareness and technical knowledge as well as investments in these technologies, the comparatively wealthy regions profit from such innovations, while those which already struggle with increasing energy costs lag behind. However, it should also be noted that such new technologies require a high level of expertise for their implementation as well as training for the first-time users.

11. In the EECCA and SEE counties, the situation is quite different. After more than a decade of stagnant housing production, new housing programmes are now being developed. While this could be a chance to improve the energy performance of the housing sector by undertaking a step-by-step restructuring of the existing stock, there seem to be several barriers that hamper the use of the newest construction techniques, including:

(a) A weak public sector with no or insufficient housing budgets (in Western Europe in most cases, budgets have stimulated such innovations);

(b) Outdated building codes;

(c) Little knowledge within the local construction sector about new technical improvements;

(d) Low levels of research activity both in the public and private sectors;

(e) A market which is dominated by high demand rather than by sufficient supply which weakens the role of critical consumers.

12. As a result, the energy performance of most new housing projects is far behind the standards achieved in other, more developed, parts of the UNECE region.

C. Synergies with the Energy Efficiency 21 Project of the UNECE Sustainable Energy Division

13. Since 1991, the Energy Efficiency 21 Project (EE21) has worked to achieve sustainable development in the energy sector at the regional level. The project's main objectives are to help EECCA and SEE countries enhance their energy efficiency, diminish fuel poverty and meet international environmental treaty obligations under the United Nations Framework Convention on Climate Change and UNECE. A new project, Financing Energy Efficiency Investments for

Climate Change Mitigation, is providing for the establishment of a public-private partnership dedicated fund to finance energy efficiency investments in 12 EECCA and SEE countries: Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Kazakhstan, Moldova, Romania, the Russian Federation, Serbia, The former Yugoslav Republic of Macedonia and Ukraine. This new phase of EE21 is supported by the Global Environmental Facility (GEF), the United Nations Foundation (UNF), the Fond Français pour l'Environnement Mondial (FFEM) and the European Business Congress (EBC), with an approved amount of US$ 7.75 million.

14. A CHLM initiative dovetails neatly with the second objective of EE21; the initiative's goals are is to strengthen energy efficiency and renewable energy policies through a wide-ranging regional assessment, case studies and workshops and seminars for policymakers. Within the limited budget resources, the process will begin with a broad analysis of the policy reforms needed to promote energy efficiency and renewable energy investment and to reduce fuel poverty in the 12 participating countries. It will include 20 case studies of individual projects or classes of projects.

15. To stimulate synergies and cross-fertilization between the CHLM initiative and the EE21 project, the CHLM secretariat presented the information on energy efficiency in housing and at the conference on "International Cooperation on Energy Efficiency: Working Together for a Low-Carbon Economy" held from 28 to 30 May in Geneva. The final report of the conference requests the secretariat of the Sustainable Energy Division to cooperate with the CHLM on future work regarding energy efficiency in housing.

16. It is envisaged that the Sustainable Energy Division be an important partner in the Committee's future work of, in particular with regard to future workshops on the subject.

D. An active role for the Committee on Housing and Land Management

17. The Committee's sixty-ninth session supported the proposal by the delegation of Austria to initiate a project on energy efficiency and energy saving in the housing sector in cooperation with the UNECE Sustainable Energy Division. The Austrian delegation was invited to prepare a written proposal, to be submitted to the CHLM Bureau at its next meeting in 2008. Several delegations expressed their interest in participating in such a project. Maximizing synergies by cooperating with other international organizations, e.g. CECODHAS (the European Liaison Committee for Social Housing), was also suggested.

18. CHLM could contribute in different ways to the increase of energy efficiency in buildings in countries of the region. As mentioned above, the Committee could not only cooperate with EE21 Project, but also identify major trends and problems for energy efficiency in housing, provide sound policy advice, and promote and assist with respect to capacity-building.

19. Based on the findings and recommendations in the work carried out by CHLM – i.e. the Guidelines on Condominium Ownership and the Strategies on Urban Renewal and Housing Modernization – a group of experts could for instance collect the newest technical developments in the field of energy performance of existing buildings and help to disseminate them to decision makers and practitioners.

20. A preliminary version of this note was presented and discussed at the CHLM Bureau meeting in May 2008. During that meeting, participants stressed that the topic of energy efficiency is of growing importance in the region, especially given its linkages and relations to environment and climate change as well social and economic issues. The establishment of a task force to progress on work on this issue was discussed and agreed to in principle by the Bureau.

21. A further proposal was holding a kick-off workshop at the end of 2008 or beginning of 2009, which could set the stage and mandate for CHLM work on energy efficiency in housing as well as assess the impacts of the issue, the main challenges and existing good practices. A follow-up workshop in the spring of 2009 could also be organized, in cooperation with the aforementioned bodies, to present and discuss progress made and results. These workshops could be combined with study visits to innovative projects already in place.

22. Participants also proposed formalizing cooperation with CECODHAS vis-à-vis the organization of the workshops. A subsequent exchange of letters between the CHLM and the CECODHAS secretariats has fulfilled this need.

23. The CHLM Bureau requested the secretariat to present the Committee's sixty-ninth session with an updated concept note reflecting the discussions that had taken place, a draft agenda of the kick off workshop, and information on the mechanisms identified accomplish the work, namely the proposed task force. Accordingly, annex I to this note contains the terms of reference of the proposed task force. Annex II contains elements for the programme of the first workshop.

24. The following timetable was tentatively proposed:

(a) **September 2008**: Consideration of the concept note by the Committee, and endorsement of the decision to establish a Task Force on Energy Efficiency in Housing for the organization of the two workshops;

(b) **By end of 2008**: Creation of the Task Force and organization of the kick-off workshop;

(c) **February–March 2009**: Kick-off workshop (possibly in a EECCA or SEE country) in cooperation with CEDODHAS;

(d) **September 2009**: Draft report is presented to the Committee. Discussion and advice on next steps and further work;

(e) **October–November 2009**: Second workshop (to be held in Vienna) to present results and receive feedback from UNECE member States;

(f) **2010**: Publication of results and recommendations.

25. The following major questions are proposed for discussion at the Committee's session:

(a) What are the main gaps in energy efficiency in your country?

(b) Is the legislative framework adequate and supportive of energy efficiency in housing?

(c) Are there incentives for the public and private sectors to invest in energy efficiency?

(d) What is the status of practice in this field?

(e) What are other main areas or key issues to be addressed to promote better energy efficiency in housing?

(f) What are the ongoing discussions regarding energy efficiency in housing in your country?

26. The Committee is invited to:

(a) Further discuss ideas and questions contained in this concept note;

(b) Consider and endorse the proposals contained in the note, as approved in principle by the Bureau at its meeting on 9 May 2008, including the creation of the Task Force on Energy Efficiency in Housing and the organization of the two workshops;

(c) Review and agree on the terms of reference for the Task Force (annex I) and the programme elements for the first workshop (annex II).

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Annex I

DRAFT TERMS OF REFERENCE OF THE TASK FORCE ON ENERGY EFFICIENCY IN HOUSING

Background

1. The Task Force will be composed of a maximum of 15 members from UNECE member States, non-governmental organizations (NGOs), the UNECE secretariat, CECODHAS and practitioners.

2. Members will be expected, through their professional expertise and experience, to contribute to the work of the UNECE Committee on Housing and Land Management (CHLM) on energy efficiency in housing, including preparatory work for the two workshops and the development of relevant material and outputs.

3. The geographical focus of the Task Force will be the UNECE region, with a particular attention on SEE and EECCA countries. The Task Force will provide a comprehensive reading of the challenges in the region, considering environmental, social and economic aspects related to energy efficiency in housing.

4. While the scope is broad, recommendations and conclusions will be specific and will address in particular the existing gap between decision-making in the sector and practice. While recommendations will be valuable for the whole housing sector and problems and solutions will be discussed both for existing housing and new housing construction, the Task Force will focus its practical guidance mainly on existing building stock.

Purpose

5. The purposes of the Task Force is to:

(a) Identify the main challenges, constraints and opportunities (economic, social, political and institutional) for energy efficiency in buildings;

(b) Identify and recommend appropriate building techniques and solutions and suggest how best to deploy them in the ECE region;

(c) Identify and recommend effective organizational models, including distribution of responsibilities and roles;

(d) Identify and recommend adequate financing mechanisms.

6. The Task Force will also have to consider how to overcome the several barriers concerning the use of the appropriate and newest construction techniques in UNECE countries, including:

(a) Weak public sectors with no or insufficient housing budgets (in Western Europe, in most cases, budgets have stimulated such innovations);

(b) Outdated building codes;

(c) Little knowledge within the local construction sector about new technical improvements;

(d) Low levels of research activity both in the public and in the private sector; and

(e) Markets dominated by high demand rather than by sufficient supply, which weakens the role of critical consumers.

7. Through the two workshops, the Task Force will promote dialogue on programmes and best practices on energy efficiency in the region, analyse success factors and develop pertinent recommendations.

Selection of members

8. The Task Force will be composed of a maximum of 15 interested and committed representatives of members States and NGOs, members of CECODHAS and interested practitioners, with the participation of the UNECE Secretariat from the Housing and Land Management unit and the Sustainable Energy Division.

9. Members of the Task Force should:

(a) Be experts in the sector of energy efficiency and housing, be responsible for country policies in the sector or operate in the energy efficiency private sector;

(b) Commit sufficient time to the work of the Task Force;

(c) Regularly attend the meetings scheduled via teleconference or in person;

(d) Regularly contribute to the documents and discussions under the Task Force, and to the preparation of the two workshops.

10. Attention will be also given to achieving balanced geographical representation of member States, and between decision makers and practitioners.

Meeting schedule: timing and modus operandi

11. Meetings normally will be held by teleconference, but it is expected that at least one meeting will be held in person prior to and after each workshop, at the same venue. A meeting could also be organized, if needed, in Geneva during the intersessional period (for eligible countries, support would be provided by UNECE).

12. The Task Force will elect a chairperson at its first meeting.

13. The outputs of the Task Force's work and the two workshops will be issued in early 2010.

14. The Task Force meetings will be organized by the UNECE Housing and Land Management Unit in cooperation with the UNECE Sustainable Energy Division, and in consultation with CECODHAS.

15. The workshops will be organized by the UNECE secretariat and CECODHAS in cooperation with the host country.

Reporting

16. The Task Force is expected to report to the regular session of the Committee on Housing and Land Management, as well as to the meetings of its Bureau.

Agenda distribution/minutes

17. The agendas for Task Force meetings will be prepared by the Task Force and finalized by the CHLM secretariat in consultation with the chairperson of the Task Force at least one week prior to the meeting.

18. Similarly, minutes containing the decisions taken at the Task Force meetings will be prepared by the CHLM secretariat in consultation with the chairperson of the Task Force, and circulated to the Task Force members.

Staff support/servicing of the Task Force

19. Staff support for the normal proceedings of the work of the Task Force will be provided by the CHLM secretariat.

20. The host country, the CHLM secretariat, Task Force members and CECODHAS will provide support for the organization of the two workshops.

Resourcing of the Task Force

21. The Task Force will have no budgetary authority.

22. UNECE will allocate staff time to the servicing of the Task Force and the organization of the workshops. Any additional tasks, including organization of the workshops, will require additional donor financial support.

Annex II

ELEMENTS FOR A DRAFT PROGRAMME OF THE FIRST WORKSHOP ON ENERGY EFFICIENCY IN HOUSING IN THE UNECE REGION

1. The first workshop of on energy efficiency in housing will be mainly focused on identifying the main challenges for the region and areas where the Task Force could produce practical recommendations and guidance. Based on the issues identified in the concept note and the work of the Task Force in its initial period, the main items to be considered at the first workshop on energy efficiency and housing should be the following:

Session 1: The impact of the problem: environmental, social and economic aspects and challenges of energy efficiency in housing

2. This session will explore the pitfalls of inadequate energy efficiency strategies, plans and practices and identify the benefits of housing energy efficiency for the three pillars of sustainable development. In particular, presentations should focus on:

(a) Climate change and mitigation measures;
(b) Social exclusion – including fuel poverty – and better housing conditions;
(c) Energy performance and energy imports.

Session 2: Challenges and constraints in the housing sector, and the gap between decision-making and practice

3. This session should provide an overview of the constraints to effective energy efficiency policies and practises in the UNECE countries, including:

(a) Institutional factors (e.g. a weak public sector, the role of private sector, the role of agencies);

(b) Financial issues (e.g. types of subsidies and incentives, budgets);

(c) Technical challenges (e.g. knowledge and the availability of existing technical improvements, identification of best technology, technology transfer);

(d) Organizational aspects (e.g. distribution of roles and responsibilities);

(e) Legal issues (e.g. building codes, enabling legislation).

Session 3: "Problem solved": best practices and analysis of a solution found for a specific problem, and impact of decisions taken

4. This session will review some best practices and solutions, and present how in some cases action in one or more areas has been tailored to solve a problem successfully. Successful practices could again cover the areas identified above:

(a) Institutional (e.g. how changes in the institutional architecture have supported the successful identification of energy efficiency policies);

(b) Financial (e.g. effective subsidies or incentives, or alternative financial strategies or donor policies);

(c) Technical (e.g. specific affordable technical solutions, matching a technical problem with the solution);

(d) Organizational (e.g. the reorganization of roles and responsibilities within a national or local structure to respond to energy efficiency problems);

(e) Legal (e.g. by-laws or codes that have created a favourable and enabling environment and have led to effective initiatives).

Session 4: Conclusions and recommendations of the Task Force's work

5. This final session will identify the main elements for and focus of the intersessional work of the Task Force.