



Reflection of different aspects of energy efficiency and energy saving in available informative resources (books and brochures) in Latvia

Report has been prepared within the frame of the project „Exchange of information and promotion of cooperation for increasing energy efficiency of energy resource use and facilitation for changing consumer patterns in the Baltic states”



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Investigation of informative resources has been carried out within the project **“Exchange of information and promotion of cooperation for increasing energy efficiency of energy resource use and facilitation for changing consumer patterns in the Baltic States”**. 113 publications (books and brochures) published since 1972 and available in the libraries and information centres of local authorities have been collected and analysed.

The scope of resources available for readers in the libraries of Latvian local authorities on energy efficiency and energy saving aspects is very broad and diverse. One can find in the libraries books and brochures on efficient energy use published in 1970's, as well as quite new publications. For example, both book of 1996 „Energoefektivitāte” (“Energy efficiency”) [102] and book of 2002 „Enerģijas taupības rokasgrāmata” (“Energy saving manual”) [71] provide general overview on energy saving measures. In most recent books, the energy efficiency issues have been viewed in complex with house building, heat supply or environmental protection aspects.

The housing sector provides many opportunities to reduce energy use. It is important to not only increase the energy efficiency of the existing buildings by insulation, but also promote building of new energy efficient houses. Several manuals are available in libraries that cover all most important issues related to **building and repairing** residential houses [6; 38; 55; 66; 91; 98]. Separate chapters of the books are devoted solely to **insulation** of construction envelope (walls, roof, loft, basement, etc.). These books are valuable help for the house owners who would like to keep and exploit own house as good as possible.

The other published resources are devoted to specific issues, e.g., execution of hydro-isolation and insulation works [53], as well as calculations of heat energy losses from construction envelope [54]. Also, some publications are directly targeted to the owners or superintendents of real estates for efficient and rational management [58; 96], administration of heating in living houses [67] and optimisation of heating systems [75].

In Latvia, apartment houses dominate with the annual heat energy consumption above 100 kWh per m². This figure very much differs from the average energy efficiency level in the European Union. Thus, the limited energy resources are being used even more, but residents have to pay for inefficiently used energy. The consumption is so high mainly due to high heat losses. The worst situation often occurs in block apartment houses built during the Soviet reign. The housing fund of Latvia is generally characterised and thermal efficiency of most typical tract houses is summarised in the publication of 1999 „Ēku siltumefektivitātes paaugstināšana” (“Improvement of heating efficiency in buildings” [90]. The publication describes insulation possibilities for these buildings, choice of materials and costs.

Also other publications devoted to energy efficiency evaluation in dwelling houses are available in the libraries. They provide **practical advice on improvement of energy efficiency** in private houses and **energy saving measures in dwellings** [3; 9; 21; 22; 25; 48; 52; 60; 73; 84; 90]. The main measures for improving energy efficiency in the houses mentioned in the publications are as follows:

- Insulation of outer walls from outside/inside;
- Sealing the gaps in the existing windows and jambs;
- Change of the windows;
- Loft insulation;
- Instalment of hot and cold meters in flats;
- Choosing economical plumbing equipment;
- Replacing of the existing radiators and convectors.

Although the reduction of heat losses has a very high importance, often there are situations in modern buildings when insulation is installed but not enough attention has been paid to the **ventilation** of the building. For example, instalment of insulated glass package windows results in problems with the building aeration. Changes are obviously seen – rooms are warmer, but the necessity to often ventilate them arises due to increased humidity and sticky air. Sometimes mould appears on the walls and ceiling surface right above the windows. The cause is lack of afflux ventilation and insufficient air exchange between the rooms. Possible solutions are:

- Installing ventilation devices in the window that operates by response to changes in air humidity (process is automatic).

- Regular ventilation of the flat by opening windows.
- Installing intensive ventilation system in the flat.

Several publications [9; 22; 25; 38; 52; 84; 90; 91; 103] offer information on the necessity of efficient **ventilation**, the impact of humidity on building envelope and indoor microclimate, as well as the impact of ventilation on the energy efficiency of buildings.

Nevertheless, before performing energy efficiency improvement measures it is important to evaluate where the biggest heat losses occur in the building and what exactly measures are needed. Therefore, it makes sense to invite an expert who would inspect the buildings – energy audit prior starting works. The libraries of local authorities offer information on the necessity and benefits of the **energy audit**; priority measures to improve the energy efficiency of buildings are described, the necessary investments and savings gained during performing the measures are recognised [22; 48; 63; 65].

Already now we receive information on the electricity consumption of certain electric appliances when buying them. The information on the labelling of energy efficiency could be obtained in published resources [62]. Also, before buying a house or flat the question becomes more pending, what is the energy efficiency of the building or what is the specific heat energy consumption. In future, the **energy certificate** will provide the answer to this question. The results of a building certification project already now provide information on the full energy consumption of certain living houses at Ogre town [18].

Energy and environmental issues become more important from year to year driven by increasing negative impacts of anthropogenic activities on the environment, as well as by reduction of available fossil resources. The libraries of Latvian local authorities offer several publications that provide insight in energy use and its relation to **environmental protection and climate change** [51; 56; 76; 85; 94; 100; 106]. The main attention in these publications is paid to the experience how to reduce energy use in any life activities as the precondition for resource and asset economy, as well as environmental protection. The publication provides overview on the energy consumption in the world, the impact of energy sector on the

environment and legislation; economy of lightening energy; possibilities to save energy in households; rational energy use in production; possibilities to increase energy efficiency; heat losses; economic calculations for saving measures [51; 65; 94; 103].

Local authorities have a significant role in ensuring and promoting sustainable and energy efficient building practise in own territories. The libraries offer publications that stress both state and local authority tasks in implementing EU directive requirements: to prepare heat supply development concepts, carry out energy efficiency increasing measures in buildings belonging to the local authority, as well as inform, involve and support the local residents in more efficient use of energy [20, 84]. Many publications also provide best practise examples on the increase of energy efficiency and efficient use of energy resources in buildings of several Latvian local authorities [5; 20; 27; 45]. Information is provided about benefits of every renovation measure, what are the gains for building owners, how to finance the measures of heat energy saving [45], and how sometimes with small investment and use of different support programmes for energy saving heat economy may be achieved in Latvia [46].

The experts of local authorities can obtain valuable information from the publications on development principles and strategies of the projects aimed at implementing energy efficiency measures [83]; energy services, project implementation and practical examples in Latvia and other states [34]. Other publications provide overview on efficient use of energy and assets [70], basics of energy planning in local authorities [36] and importance of electricity [7]. The publications also list the main criteria in energy planning:

- Safety of energy supply (gathered information on existing and potential clients, contracts with producers, consumers and suppliers).
- Availability of energy resources; alternative fuels.
- Cost-effectiveness of the project.
- Air quality and emissions.
- Prices and tariffs (economic criterion).
- Sustainable development.

The experts of communal services will benefit from the publications on planning water, heating and hot water supply systems [77; 79; 109; 111], heat losses and the possibilities to reduce them by insulating pipelines [80, 112], as well as from the publication on the basics of the automation of heat, gas and water engineering systems [30] and the system of settlement for used heat energy [28].

Several publications provide the opportunity to get acquainted with best practice examples in Latvia and other states: improvement of energy use efficiency and use of renewable energy resources; saving heat energy and implementation of different measures to ensure the building comfort along with economic expenses [5; 15; 20; 45; 47; 50; 75; 90].

During last years, there is high interest of the public in the **use of different renewable energy resources** to reduce the expenses for electricity and heat. Many resources provide information on energy (including nuclear energy) production and types of the use of renewable energy resources in Latvia [1; 10; 14; 26; 40; 61; 68; 69; 78; 92; 95; 107]. Publications are available for inhabitants with the information on heat pumps and the possibilities of their use, technological solutions, economic and ecologic aspects of the use [1; 75]. Several publications on solar energy [12; 95; 103] and wind energy use [23; 32; 39; 95] are available. Publications on biomass (mainly wood) use in heat supply comparing with the efficiency of other fuels are available [15; 25; 50; 104], practical advice and the experience of local authorities are provided how to successfully introduce biomass in heat supply system, why this change is beneficial and what gains are expected for inhabitants and the environment [47; 50].

Both economy and environmental experts can access **data** sets on the use of energy and other resources in various sectors [8; 35], reports on the development of energy system in Latvia [86; 87; 99; 101; 113], and the investments in energy sector in the Baltic Sea Region [88].

Some publications provide overview on the **energy and environmental policy of the EU**, main directives of the EU [20] and the role of Latvia in implementation of the EU policy [24].

Often for orientation in technical terminology, **explanatory term dictionaries** are useful. The libraries offer dictionaries, for example, in energy sector that provide explanation and translation with equivalents in English, Russian and German [44], as well as the energy efficiency of buildings (terms in English and Latvian) [74].

The libraries offer publications also in **English and Russian**. There are several publications on the availability of energy resources, production and trade of electricity [16; 33; 41; 42; 43; 72; 105; 108], climate change [4; 31], cleaner energy production from renewable energy resources [4; 13; 29; 49; 57; 93], separate publications touch, for example, the use of solar energy [2; 110] or biomass [11; 82], as well as the possibilities to improve energy efficiency in living houses in the states of the former Soviet Union [97]. Most of the publications have been published abroad, but also publications do exist that have been published in Latvia, mostly available in Latvian, English or Russian. For example, the research report on energy consumption and certification at Ogre town [17; 18], as well as the publication „Daudzdzīvokļu energoefektivitāte - sociāla un vides nepieciešamība” (“Energy efficiency in apartment houses – social and environmental necessity”) [59; 60] have been published in English and Latvian. For English and Latvian readers, libraries also offer reports from different conferences [37], the thesis by A.Blumberga „Ēku energoefektivitātes izpēte. Ekonomiskā un ekoloģiskā optimizācija” (“Investigation of energy efficiency in buildings. Economic and ecologic optimisation” [64; 65] and the publication „Vides projekti Latvijā: tīrās tehnoloģijas, lauksaimniecība, enerģijas taupība, ūdenssaimniecība, pārstrādes uzņēmumi” (“Environmental projects in Latvia: cleaner technologies, agriculture, water management, processing enterprises” [76; 89].

In English, the publication issued by the Ministry of Economy of Latvia on energy sector is available [87]. In Latvian and Russian, the book „Kā iedzīvotājiem samazināt savus maksājumus par siltumu?” (“How to reduce expenses for heating?”) has been published [25].

Public **awareness**, understanding of the necessity of the measures and active participation in their performance have a high role in reaching the target of energy efficiency. Information on energy saving possibilities has to be included already in the education programmes of schools [19]. Finding the right ways and means to

receive the support of the residents in this field is equally important to local authorities. The manual on planning public relation offers advice for the authorities in the work with the society [81].

Nevertheless, most publications available in the libraries of Latvian local authorities contain quite specific technical information that is often understandable only for sector experts. Performance of the described measures mostly requires investing bigger or smaller financial resources. Comparatively low number of publications provides information in popular scientific way how any residents - **both children and adults** - can save energy at home and in social life, as well as reduce own impact on the environment, in parallel saving monthly expenses. A good example is the brochure "A-enerģija" ("A-energy") published in 2005 that in interesting and simple language provides practical advice how to reduce the expenses for heat, how to reduce the amount of consumed water and energy in cookery, washing the dishes or doing laundry, using electric or electronic appliances, as well as transport vehicles [26].

Conclusions

The libraries of Latvian local authorities offer various informative resources – books and brochures - on energy efficiency issues. Mostly the publications reflect technical aspects and solutions (e.g., practical advice, technologies, and choice of materials), as well as economic benefits (expenses and savings). On the other hand, much less publications may be found that stress the necessity of complex solutions, including also social, environmental and health aspects. Only few publications underline that the issue of energy efficiency improvement has to be solved together with parallel planning of the corresponding infrastructure development of settlements.

The list of the books and brochures available in the libraries and information centres of Latvian local authorities

1. D.Blumberga. Siltuma sūkņi (RTU)
2. Northsun 2007: 11th international conference on solar energy at high latitudes, May 30- June 1, 2007 (RTU) Abstract book
3. Daudzdzīvokļu dzīvojamo māju energoefektivitātes stāvokļa analīze un ieteikumi (Mājokļu aģentūra)
4. Impacts of climate change on renewable energy sources: their role in the Nordic energy system: a comprehensive report resulting from a Nordic energy research project (Nordic council of Ministers)
5. Taupiet enerģiju-saudzējiet klimatu -ietaupiet naudu (Latvijas Investīciju un attīstības aģentūra)
6. P. Hemgrēns, H. Vanforss. Būvējam māju no A līdz Z (Zvaigzne ABC)
7. Elektrības nozīme
8. Latvijas enerģētika skaitļos (angļu un latviešu valodā). Latvijas Investīciju un attīstības aģentūras Enerģētikas nodaļa
9. Borodiņecs A.Dzīvojamo ēku energoefektivitātes novērtēšana, promocijas darbs (RTU)
10. Birzniece I. Atjaunojamie enerģijas resursi, to izmantošanas un ražošanas ekonomiskās perspektīvas Latvijā (Ventspils augstskola)
11. The little green data book, 2006. From the world development indicators. Agriculture. Forests and biodiversity. Energy. (The world bank)
12. Saules elektroenerģija. Ekodoma
13. Regulating energy and natural resources (Oxford University press)
14. Mūsu pasaules izredzes: pārspīlētā ekoloģija. Izsīkstošā atomenerģija u.c.(Arte)
15. Lazdiņš A. Meža biomasas sagatavošana un izmantošana (vides projekti)
16. Implementing the internal energy market: annual report 2005
17. Energy certification in the light of the Directive 2002/91/EC: The experience of RTU in introduction of buildings Energy certification in Ogre town/ENCERB A.Borodinec
18. Ēku enerģētiskā sertificēšana Direktīvas 2002/91/EC gaismā: RTU pieredze ēku enerģētiskās sertificēšanas ieviešanā Ogres pilsētā/ENCERB
19. Energoizglītība: nākamo enerģijas patērētāju apmācība/EK.- Luksemburga: Eiropas Kopienu oficiālo publikāciju birojs
20. Energoefektivitātes paaugstināšana un atjaunojamo energoresursu izmantošana pašvaldībās. Baltijas Vides Forums
21. Ēku energoefektivitāte Baltijas valstīs (BENEFIT- 2006) starptautiskas konferences materiāli
22. Daudzdzīvokļu dzīvojamo māju energoefektivitātes potenciāla noteikšana; Valsts aģentūra „Mājokļu aģentūra” Pētījums http://energoaudits.ma.gov.lv/enef_2006/users/Oetijums_Last.pdf
23. Dirba J. Vēja enerģijas elektromehāniskie pārveidotāji (RTU)
24. Apins A. Latvijas loma ES enerģētikas politikā (Ventspils augstskola)
25. M. Rubīna, P.Šipkovs, M.Kašs. Kā iedzīvotājiem samazināt savus maksājumus par siltumu? (ANO attīst.progr.; Pasaules vides fonds) (latv/krievu valodā)

26. Tooma, I.Ziemelis, A-enerģija
27. Sasniegt vairāk ar ierobežotiem resursiem: zaļā grāmata par energoefektivitāti/EK- Luksemburga: Eiropas Kopienu Oficiālo publikāciju birojs
28. Kurts Jānis. Norēķinu sistēma par patērēto siltumenerģiju (Vidzemes augstskola)
29. European Environmental agency. How much bioenergy can Europe produce without harming the environment? EEA Report
30. Dzelzītis E. Siltuma, gāzes un ūdens inženiersistēmu automatizācijas pamati (Rīga, Vides uzlabošanas veicināšanas, siltuma, gāzes un ūdens racionālas izlietošanas fonds)
31. Climate change and a European low-carbon energy system/European Environment Agency
32. Vēja enerģija Baltijā:konf.materiāli (Rīgas menedžeru skola)
33. Revisiting reform in the energy sector: Washington:the world bank
34. A.Blumberga, D. Blumberga, Energoserviss. Energoservisa pakalpojumi 2.grāmata
35. Resursu patēriņa novērtējums (Latv.vides aģent.)
36. D.Blumberga, M.Blumberga, I.Kārnupa, C.Rochas. Energoplānošana Ekodoma/Opet network
37. Modernas tehnoloģijas enerģijas ieguvei un efektīvai izmantošanai = Advanced Technologies for energy producing and effective utilization. Starptaut.zin.konf. 2004.gada 28.-29.jūnijs
38. Doršs Ilmārs. Dzīvokļa remonta darbi un to izmaksu apzināšana.
39. Latvijas vēja enerģijas rokasgrāmata. Gamaļajevs, Ostapenko. (Rīgas menedžeru skola)
40. Kodolsintēzes pētījumi: enerģijas piedāvājums Eiropas nākotnei (Brisele, Pētniecības ģenerāldirektorāts)
41. Helm Dieter. Energy the state and the market: British Energy policy since 1979
42. Fusion on energy option for the future.- Brisele (Euratom-fom)
43. Energy resources, energy policy and democratic development in the Baltic Sea Region (Berlin)
44. Elektroenerģētikas pamatterminu skaidrojošā vārdnīca (Jumava): 1923 termini ar ekvivalentiem angļu, krievu un vācu val.
45. Daudzdzīvokļu ēku energoefektivitātes paaugstināšanas iespējas Rīgā (Rīgas pilsēt būvnieks)
46. G. Aistara. Kā panākt siltuma taupīšanu ar maziem ieguldījumiem? Pašvaldību rokasgrāmata energotaupības atbalsta programmu izstrādei/Vides projekti: ANO attīstības programma
47. Siltumapgādē izmantosim vietējo kurināmo – koksnes un citu biomasu: rokasgrāmata pašvaldību vadībai un darbiniekiem (Ano attīst.progr.un PDF)
48. Siltuma un elektrības taupīšana mājoklī: materiāls dzīvokļu īpašniekiem un apsaimniekotājiem zināšanu paplašināšanai enerģijas efektīvas izmantošanas jautājumos (Blumberga, Veidenbergs, RTU)
49. Renewable energy sources in Estonia, Latvia and Lithuania:strategy and policy targets, current experiences and future perspectives (Baltic Environmental Forum)
50. Katlu māju konversija uz vietējo kurināmo - koksnes un citu biomasu: Rokasgrāmata tehniskajam personālam (Vides projekti)

51. Barkāns J. Enerģijas racionāla izmantošana (Pasaules enerģijas padomes Latvijas nacionālā komiteja, RTU)
52. Rubīna M. Siltumapgāde: problēmas un risinājumi pašvaldību administratīvajās teritorijās
53. Noviks J. Būvdarbi 4:hidroizolācijas un siltumizolācijas darbi
54. Belinževa O. Norobežojošo konstrukciju siltumtehnikas aprēķini, RTU, Rīga
55. Lielā būvniecības grāmata (Jumava)
56. Klimata pārmaiņas un Latvija (VAK); ANO attīstības programma
57. Israeli Avrahan Environmental technologies& alternative energy developed in Israel: Israel information center
58. Gedrovičs M. Nekustamā īpašuma pārvaldnieks: teorētiskie un tehniskie aspekti (Turība)
59. G. Aistara. Energy efficiency in multi-family housing - a social and environmental necessity (Soros Foundation, Nordik)
60. G.Aistara. Daudzdzīvokļu energoefektivitāte - sociāla un vides nepieciešamība (Nordik)
61. Enerģētika: no fosilā kurināmā pie ilgtspējīgiem enerģijas resursiem (LU)
62. Energoefektivitātes marķējums: dažādu iekārtu energoefektivitātes marķējuma zīmējums (EM, Dānijas konsultāciju uzņēmums Rambo/II)
63. Ceļvedis ēku enerģētiskajā auditā (VARAM)
64. Blumberga A. Energy efficiency in dwellings. Economic and Environmental optimisation (RTU)
65. Blumberga A. Ēku energoefektivitātes izpēte. Ekonomiskā un ekoloģiskā optimizācija (RTU, disertācija)
66. Hugo Bruno Šterns. Remontdarbi savrupnamā
67. Belindževa K. Dzīvojamo ēku siltuma patēriņa vadīšanas sistēma (RTU)
68. Barkāns J. Enerģijas ražošana, RTU)
69. Baltijas reģiona ilgtspēja. (LU) 2.lekcija Enerģētika: no fosilā kurināmā pie ilgtspējīgiem enerģijas resursiem
70. Gedrovičs M., Enerģijas un līdzekļu racionāla izmantošana (Latvijas pašvald.māc.centrs)
71. Enerģijas taupības rokasgrāmata (Fizikālās enerģētikas institūts)
72. Energy in Finland 2000: oil and gas; power and heat; operation and maintenance: Engineering. – Espoo: Fortum corporation
73. Ēku siltumefektivitātes paaugstināšana (VARAM Būvniecības departaments, VU Vides projekti, 2.papildin.izdevums)
74. Ēku energoefektivitātes terminu vārdnīca: angļu/latv.; latv./angļu (Ekodoma)
75. Apkure privātmājās: šķidrās kurināmais, elektrība, malka, siltumsūkņi, regulēšanas sistēmas, siltuma sistēmas (rokasgrāmata) (Norden)
76. Vides projekti Latvijā: tīrās tehnoloģijas, lauksaimniecība, enerģijas taupība, ūdenssaimniecība, pārstrādes uzņēmumi u.c. (Vides projekti).
77. Dzelzītis E., Krēsliņš A., Jaunu ūdens, apkures un karstā ūdens apgādes sistēmu projektēšana, Rīga
78. Simpozija "Alternatīvā enerģija Latvijā" referātu krājums 1999.g.12.novembrī
79. Dzelzītis E., Krēsliņš A., Apkures un karstā ūdens apgādes sistēmas
80. Siltuma zudumi un cauruļvadu izolācija (Celtne S)
81. Sabiedrisko attiecību plānošanas rokasgrāmata energoefektivitātes paaugstināšanai pašvaldībās (LPMC, Vides projekti)

82. Quaak Peter. Energy from biomass:
83. Projektu sagatavošanas rokasgrāmata energoefektivitātes paaugstināšanai pašvaldībās (LPMC, Vides projekti)
84. Politikas plānošanas rokasgrāmata energoefektivitātes paaugstināšanai pašvaldībās (Latvijas pašvald.māc.centrs, Vides projekti)
85. Magelis L. Daba un enerģētika: apcerējumi un publikācijas
86. Latvijas energosistēma gadu gaitā (Latvenergo)
87. Latvia Energy review/ Energy department of the Ministry of economy
88. Investīcijas enerģētikā Baltijas jūras reģionā: Starptautiska konference, Rīga, Latvija, 1999.gada 6.-8.aprīlis: programma un tēzes, Rīga (EM)
89. Environmental projects in Latvia (Vides projekti) Cleaner technologies, agriculture; energy saving etc.
90. Ēku siltumefektivitātes paaugstināšana (VARAM Būvniec.dep.; Vides projekti)
91. Jānis Grabis. Mājas atjaunošana
92. Blūma F. Alternatīvā enerģija, ekotehnoloģijas un apkures sistēmas (zaļā bibliotēka)
93. Taylor Robert P.China: A strategy for international assistance to accelerate renewable energy development. (the world bank)
94. Kā samazināt klimata izmaiņas: kopsavilkums pētījumam "Dažu politisko līdzekļu un pasākumu novērtējums enerģētikas un mežsaimniecības sektoros" (VARAM)
95. Šterns. Ūdens, saule, vējš kalpo cilvēkam (padomi kā iegūt tīru ūdeni, izmantot saules siltumu un vēja radīto enerģiju)
96. Nekustamā īpašuma pārvaldnieks: rokasgrāmata (Latvijas NĪPA; grāmatu apgāds)
97. Martinot E. Investments to improve the energy efficiency of existing residential buildings in countries of the former soviet union. (The word bank)
98. Lielā mājas enciklopēdija (Zvaigzne ABC)
99. Enerģētika un elektrotehnika
100. Barkāns J. Kā taupīt enerģiju un saudzēt vidi
101. Enerģētika-Latvijai: Domas un vērtējumi konferencē 1996.gada 17.febr.Rīgā
102. Blumberga D. Energoefektivitāte (Pētergailis)
103. Akmens P., A. Krēsliņš. Ēku apkure un ventilācija I un II daļa (Zvaigzne ABC)
104. Siltumapgādes avoti: lekciju konspekts D.Blumberga, I.Veidenbergs
105. Krause Florentin. Energy policy in the greenhouse (New York)
106. Enerģētika un ekoloģija; konferences mater. LZA
107. Osipovs B. Alternatīvie enerģijas avoti. (Avots)
108. Krenz Jerrold H. Energy conversion and utilization
109. Krēsliņš A. Ēku apkures sistēmas (Avots)
110. Kiely Charles. Solar energy
111. Širaks Z. Siltuma apgāde (Liesma)
112. Grušmanis R. Kas jāzina siltumizolētājam. (Liesma)
113. Laganovskis J. Enerģētika (Zvaigzne)