WP 4 Energy Supply

Baltic Sea Region Programme 2007-2013

Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)

URB Energy

Energy Efficient and Integrated Urban Development Action

Energy efficient rehabilitation – improvement of buildings and energy supply infrastructure

The current status

Benita Freliha

Riga City Council

June 2010, Warsaw, WP4 workshop

WP4 activities, *Jugla, PP12*

Activities	Status	Description
Elaboration of concept for energy efficient renovation of the building stock of Jugla	almost finished	To be finished in June 15
Elaboration of concept for improved heating supply system of Jugla	working on	Data analyses finished, calculation of building refurbishement effect on energy supply started soon
Organization of educational seminars and lectures about renovation and comfort level in apartments for apartment owner associations' leaders, accountants, building experts	working on	13 seminars this far for owners of multi-apartment buildings in Jugla
Development of an internet portal for on-line monitoring of indoor climate and consumption parameters of renovated and not renovated buildings in Latvia	just started	Contracts with owners of the apartments to be monitored

JUGLA: 1400ha or 14km^2, 27 367 inhabitants

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Residential buildings, *Jugla, PP12*

Number of multi-apartment buildings	**182*** multi-apartment buildings in Jugla
Number of apartments	**8040*** apartments in Jugla
Total living and heating space, m²	Total living space **366 802* m²** Total heating space **356 966* m²**
The average living and heating space per apartment, m²	Average living space per apartment **45.6* m²** Average heating space per apartment **44.4* m²**
Share of owners / tenants	Almost 100% of apartments are privately owned

** - buildings managed by SIA "Juglas nami"*

- **Building managers:**
  - 25 different building management companies (many manages one or few buildings);
  - SIA "Juglas nami" (municipal building managing company manages 141 or 78% of all buildings)

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Residential buildings, *Jugla, PP12*

- **Multi-apartment buildings**
  - Buildings with silicate brick walls (built till 1970);
  - Buildings with ceramic clay brick walls (built after 1970);
  - Prefabricated buildings with end walls of one storey high concrete slabs and facades of one storey high multi-layer light weight concrete slabs.

- **Building age vary from 1890 till 2005**
  - 94 buildings (66,7%) were put into operation from 1961 till 1970;
  - 17 buildings (12,1%) from 1951 till 1960;
  - 11 buildings (7.8%) till 1950;
  - 18 buildings (13.4%) after 1970.

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Residential buildings, *Jugla, PP12*

- **The average annual energy consumption of multi-apartment buildings (kWh/m²)**

Total heat consumption	**207* kWh/m²** or **565* MWh** per one building annually
Space heating	**~160 kWh/m²**
Hot water preparation	**~70 kWh/m²**
Electricity	**25 kWh/m² (evaluation)**

**** - buildings managed by SIA "Juglas nami", average over a 5 year period***

- **The energy saving potential:**
  - 70 kWh/m²/a after renovation would give 45% savings,
  - After refurbishement (according to the recent requirements of Latvian building code LBN-002-01 the reduction potential of the space-heating load range from 30% to 50% or from 11.6MW to 19.3MW.

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Residential buildings, *Jugla, PP12*

- **Tariffs and costs:**

	Tariff	Average annual costs per m^2
Heat	Heat for households – **39.7 LVL/MWh**	**8.2 LVL/m^2, 12 EUR/ m^2**

	Tariff
Electricity	Electricity for households – **20.6 LVL/GJ** or **74.2 LVL/MWh** Electricity for industry – **21.3 LVL/GJ** or **76.6 LVL/MWh**
Gas	Gas for households – **11.4 LVL/GJ** or **382.2 LVL/1000m^3** Gas for industry – **10.3 LVL/GJ** or **345.7 LVL/1000m^3**

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Public buildings, *Jugla, PP12*

- **Public building renovation plans in Riga**
  - Refurbishement of all school buildings till 2020 (Sustainable energy action plan of Riga for years 2010-2020);
  - Energy audits of all buildings till 2015;
  - The possible reduction of heat energy demand will be considered in the the “Concept for improved heating supply system of Jugla”.

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Energy supply, *Jugla, PP12*

- **The heat producers and suppliers (Riga)**
  - JSC “Rigas siltums”:
    - Transfers, produces, distributes and sales heating energy;
    - Covers 76% of all district heating demand in Riga (*The district heat supply covers 72% of heat energy demand in Riga*) ;
    - Founded in 1996 by Riga city Council, JSC “Latvenergo”, the Latvian commercial bank “Baltijas Tranzītu Banka”;
    - Today owned by Riga City Council (49.00%), the state (48.995%), SIA “Dalkia City Heat” (2.00%), JSC “Latvenergo” (0.005%).

Annual Report 2008, Public Utilities Commission

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Energy supply, *Jugla, PP12*

- **The electricity producers and suppliers (Riga, Latvia)**
  - JSC „Latvenergo“:
    - Imports, transmits, distributes and supplies electricity;
    - Covers more than 90% of the electricity demand in Latvia;
    - Owned by state.
  - 150 hydroelectric power plants with a total capacity of 25.2MW;
  - 15 wind power stations with a total capacity of 27.2MW;
  - 43 co-generation stations with a total capacity of 130MW.

Annual Report 2008, Public Utilities Commission

Project part-financed by the European Union.

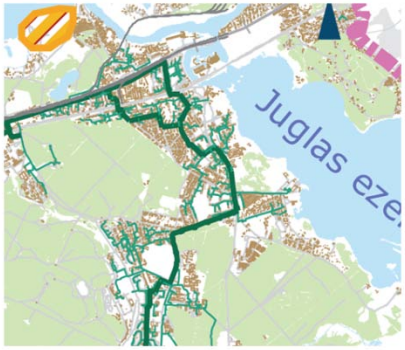
Energy supply, *Jugla, PP12*

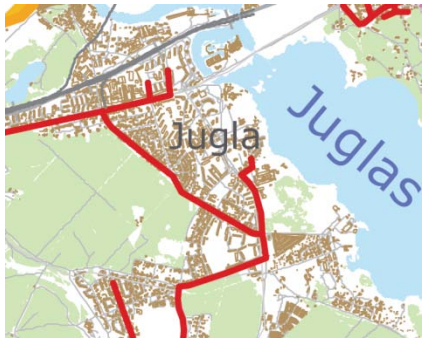
- **The heat producers and suppliers (Jugla):**
  - Jugla is mainly district heating consumer;
  - JSC “Rigas siltums” transmits and supplies heat produced by JSC “Latvenergo” CHP plants TEC1 and TEC2;
  - In 10 buildings (built from 1890 till 1966, 4 to 13 apartments in a building) ovens are used.

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Energy supply, *Jugla, PP12*

- **The energy supply infrastructure (Jugla):**
  - 2-pipe network with indirect connection for consumers via heat exchangers
  - Total length of the grid - **33 km** (7 km transmission grid, 26 km distribution grid);
  - Losses **13%** (In result of grid renovation programs the network losses are permanently decreased over the recent years in Riga);

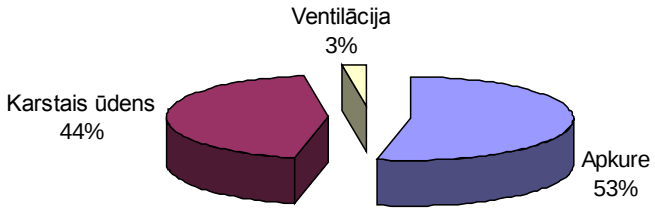




Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Energy supply, *Jugla, PP12*

- **Energy sources (Riga)**
  - Natural gas – 97%;
  - In small amounts also fuel wood.



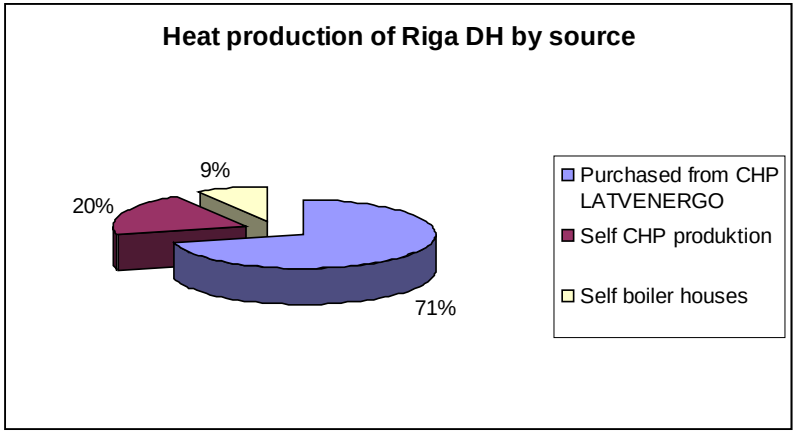
Heat loads in Jugla

- **Heat loads (Jugla):**
  - Multi-apartment buildings in total – 75.7 MW
    - Hot water preparation – 36.4 MW
    - Space heating – 38.6 MW
    - Ventilation – 0.7 MW
  - Institutional and commercial buildings in total– 12.8 MW
    - Hot water preparation – 2.5 MW
    - Space heating – 8.6 MW
    - Ventilation – 1.6 MW
  - Total heat demand of district heat consumers in Jugla – **88.5 MW**

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Energy supply, *Jugla, PP12*

- **Cogeneration (Riga)**
  - The heat production:
    - 9% produced by JSC “Rigas siltums” boiler houses;
    - 20% - by JSC “Rigas siltums” CHP plants;
    - 71% - purchased form JSC “Latvenergo” CHP plants.
  - CHP share:
    - JSC “Rigas Siltums” heat production – 73%-75%;
    - all district heating in Riga - 91%.



Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Energy supply, *Jugla, PP12*

- **Renewable Energy Sources (current situation)**
  - Latvia (2008)
    - RES in **total energy** consumption – **29,4%;**
    - RES in **total final energy** consumption – **21,9%;**
    - **District heat** produced - 26.4 PJ (4.2 PJ, **16.0%** produced from RES, increased by 4.7% comparing to 2000);
    - **Electricity** produced 7 794 GWh (3 212 GWh, **41.2%** produced from RES, increased by 13.8% comparing to 2000).
  - Riga
    - **2%** of **district heat** produced by JSC "Rigas Siltums" CHP plants are produced from RES, wood chips;
  - Jugla
    - Some private houses with solar thermo panels and heat pumps.

"*Latvian Energy in Figures*" issued by Ministry of Economics of the Republic of Latvia, 2009

Project part-financed by the European Union.

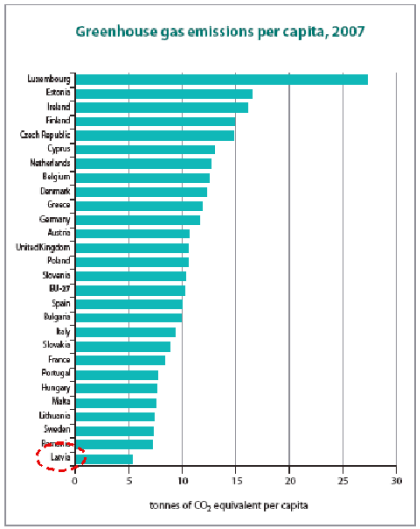
Energy supply, *Jugla, PP12*

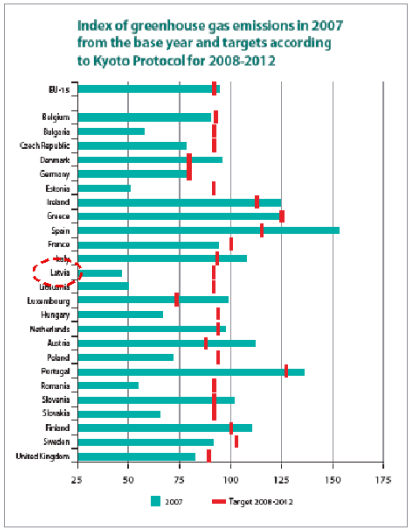
- **Renewable Energy Sources (future plans)**
  - Latvia
    - In 2009 share of RES in **electricity** production was **52.67%** (JSC "Latvenergo" data); plans to increase RES share in **electricity** to **54.57%** (in 2010 and during the next 10 years, the new RES support scheme).
  - Riga
    - The share of RES of **district heat** produced by JSC "Rigas Siltums" is planned to be raised from 2% to **12%** till 2015.
  - Jugla
    - Possible RES in district heating: solar panels on multi-apartment buildings roofs for hot water production integrated in district heating system.

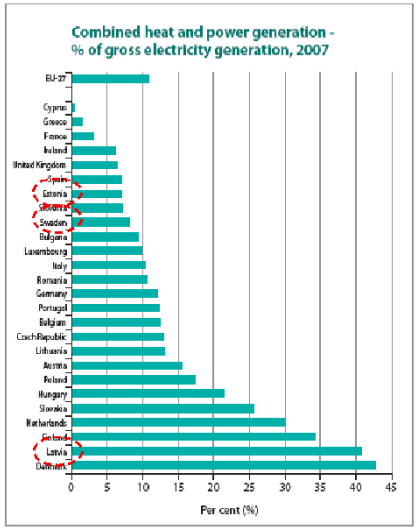
Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

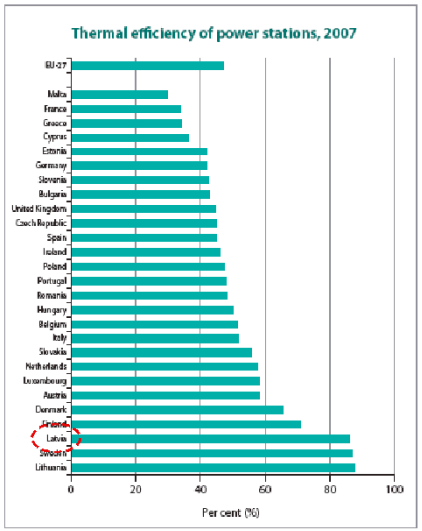
Energy supply, *Jugla, PP12*

- ***Eurostat* reports show that Latvia has:**
  - high share of CHP generation;
  - high average thermal efficiency of power plants;
  - low greenhouse gas emissions.









Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Stakeholders, *Jugla, PP12*

- **The stakeholders of PP12 (WP4):**
  - Municipal building management company "Juglas nami" (manages appr. 75% of all multi-apartment buildings in Jugla);
  - District heating company JSC "Rigas siltums":
  - Apartment owners and inhabitants.

- **Involvement of stakeholders in *Urb.Energy* project:**
  - JSC "Rigas siltums"
    - Data (consumption, pipe-line descriptions and plans, diameters);
  - Municipal building manager "Juglas nami"
    - Data, seminars, regular meetings and communication;
  - Other building managers in Jugla
    - To be involved till the end of M3.

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Stakeholders, *Jugla, PP12*

Seminars for inhabitants:

- 13 seminars (March, April 2010);
- 249 inhabitants of 13 multi-apartment buildings built from 1962 to 1969;
- Together with the municipal building manager SIA “Juglas nami”;
- Inhabitants interested in renovation:
  - especially Baltezera 7 (5 floors, 55 apartments, built in 1960);
- Planned to continue.

Date	Address		Number of attendants
3-Mar-2010	Ezermalas iela	2 k2	34
10-Mar-2010	Brīvības gatve	407a	3
11-Mar-2010	Silciema iela	13 k3	11
15-Mar-2010	Brīvības gatve	282	60
17-Mar-2010	Auduma iela	35	27
18-Mar-2010	Baltezera iela	4	11
22-Mar-2010	Brīvības iela	278	12
24-Mar-2010	Baltezera iela	7	27
25-Mar-2010	Silciema iela	5	10
21-Apr-2010	Malienas iela	76	17
22-Apr-2010	Brīvības iela	411	14
28-Apr-2010	Veldres iela	1	7
29-Apr-2010	Malienas iela	78	16
		Total:	249

The special demand:

- Apartment owners need guidance through the first steps of building’s refurbishement (the energy audit, the technical inspection) before they can make the decision for refurbishement.

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

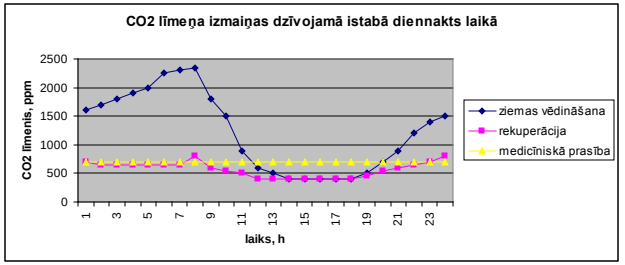
Stakeholders, *Jugla, PP12*

- ***Urb.Energy* presentation seminar (May 6, 2010):**
  - SIA “Juglas nami” invitation;
  - Employees of SIA “Juglas nami” and apartment owners attended.

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Stakeholders, *Jugla, PP12*

- **Monitoring:** (Development of an internet portal for on-line monitoring of indoor climate and consumption parameters of renovated and not renovated buildings in Latvia)
  - Inhabitant awareness rising campaign;
  - 18 apartments on ground, middle and upper floors;
  - Comparing refurbished and not refurbished buildings;
  - Internet portal that would comprehensively
  - and constantly show the monitoring results.



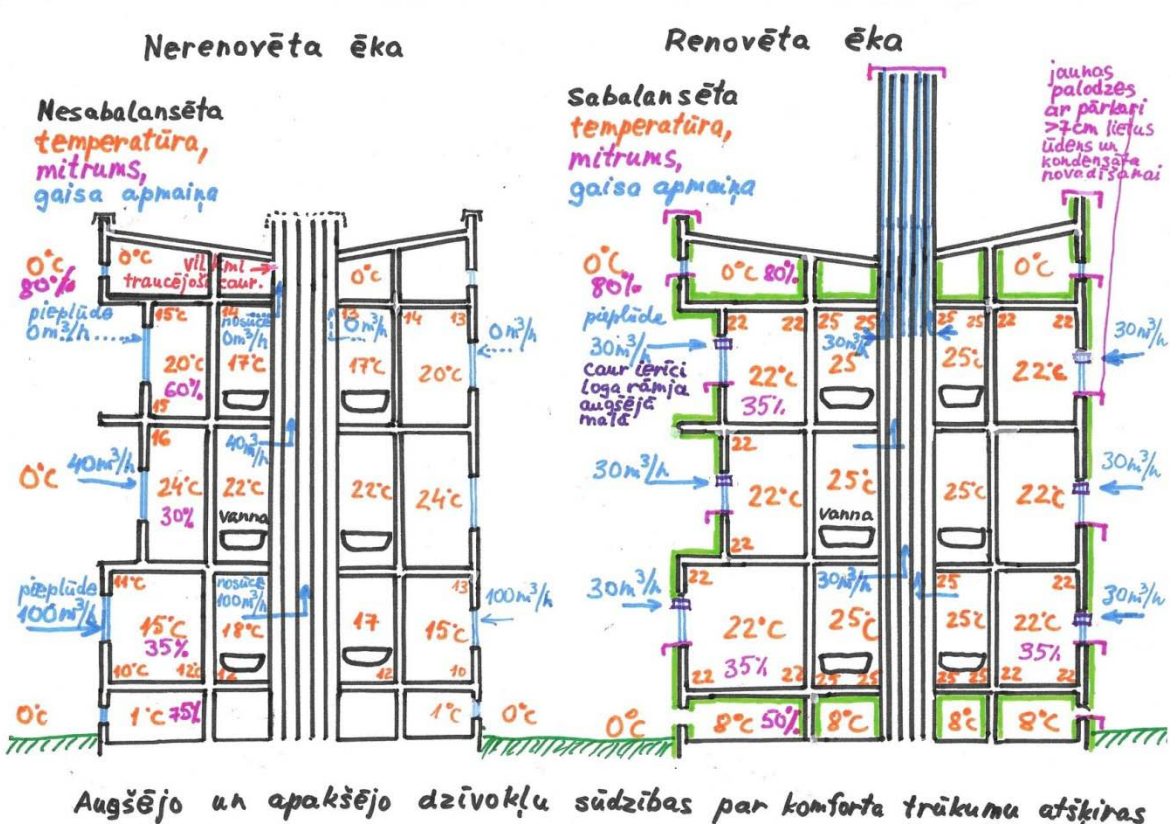
Multi-apartment buildings to be monitored:

- Celmu iela 5 (5 floors, Series No. 464, refurbished);
- Celmu iela 8 (5 floors, Series No. 464, not refurbished);
- Kurzemes pr. 14 (5 floors, Series No. 464, refurbished);
- Kurzemes pr.12 (5 floors, Series No. 464, not refurbished);
- Ozolciema 46/3 (9 floors, Series No. 602, refurbished);
- Ozolciema 56/4 (9 floors, Series No.602, not refurbished).

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Stakeholders, *Jugla, PP12*

- **Monitoring of the following parameters for each apartment:**
  - **Consumption parameters**
    - heating,
    - electricity,
    - hot water,
    - hot water in circulation consumption;
  - **Comfort parameters**
    - inside air temperature and humidity,
    - CO2 level.



Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Current results, *Jugla, PP12*

- **Urgent Problems:**
  - Buildings
    - The bad condition of roofs (a high percentage of multi-apartment buildings in Jugla have flat roofs that now are in a very bad condition);
  - Energy supply
    - The local cogeneration plant (owner SIA “Juglas jauda”) now has a significant share of the energy supply market in Jugla (besides JSC “Rigas Siltums”): as the result of this both operators have less efficiency due to reduced working hours (not a typical situation in Riga, Jugla is this only neighbourhood of Riga with such a situation);
  - Financing
    - The lack of founding for energy audits and elaboration of the technical project of refurbishement (till the end of May 2010 there was the 80% government support, Cabinet Regulation No.59)
      - Riga Energy Agency and *Advisory Council* of Energy Supply Experts of Riga City on May 17, 2010 sent a letter to Ministry of Economics with suggestions to either:
        - find additional founding and continue the Government support,
        - or to allocate some of the EU financial resources for this purpose only.

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013

Current results, *Jugla, PP12*

- **The first results:**
  - Building renovation concept including working principles of municipal energy service company will be finished on June 15 (the financial concept within WP5 already finished);
  - Owners of one multi-apartment building ready for renovation as the result of Urb.Energy activities.

THANK YOU FOR YOUR ATTENTION!

Project part-financed by the European Union.
Baltic Sea Region Programme 2007–2013